VSI ACMS for OpenVMS Managing Applications

Operating System and Version: VSI OpenVMS Alpha Version 8.4-2L1 or higher
VSI OpenVMS IA-64 Version 8.4-1H1 or higher

Software Version: ACMS for OpenVMS Version 5.3-3

VMS Software, Inc. (VSI)
Boston, Massachusetts, USA

VSI ACMS for OpenVMS Managing Applications

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Preface

1. About VSI

VMS Software, Inc. (VSI) is an independent software company licensed by Hewlett Packard Enterprise to develop and support the OpenVMS operating system.

2. Intended Audience

This manual describes how to authorize, install, run, and manage VSI ACMS for OpenVMS (ACMS) applications. It also provides information about controlling the ACMS system and its components. For information about managing ACMS systems remotely across a network, see the *VSI ACMS for OpenVMS Remote Systems Management Guide* [https://docs.vmssoftware.com/vsi-acms-remote-systems-management-guide/].

3. Document Structure

This manual contains the following chapters and appendixes:

Part I, "Managing the ACMS System and ACMS Applications"	
Chapter 1, "Introduction to Application Management"	Introduces ACMS application management, explaining the activities that such management involves and the ACMS tools you use in managing applications.
Chapter 2, "Authorizing and Controlling Terminals"	Explains how to authorize terminals for access to ACMS with the Device Definition Utility (DDU) and how to define local terminals to log in directly to ACMS.
Chapter 3, "Authorizing Users"	Explains how to authorize users to access ACMS with the User Definition Utility (UDU).
Chapter 4, "Authorizing Applications"	Explains how to use the Application Authorization Utility (AAU) to authorize ACMS applications.
Chapter 5, "Creating and Managing Queues"	Describes how to create and manage ACMS task queues and queued task elements using the ACMS Queue Manager (ACMSQUEMGR) Utility.
Chapter 6, "Using Distributed Forms Processing"	Describes how to set up ACMS for distributed processing.
Chapter 7, "Using Data Compression"	Describes how to use the data compression feature.
Chapter 8, "Controlling the ACMS System"	Describes how to start and stop the ACMS system and its components, as well as monitor system resources.
Chapter 9, "Installing and Managing Applications"	Describes how to install and run ACMS applications, cancel tasks, and modify active applications.

Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"	Explains how to set and modify the values of ACMS system parameters, OpenVMS SYSGEN parameters affected by ACMS, and ACMS process quotas using the ACMSPARAM.COM and ACMEXCPAR.COM command procedures.
Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"	Explains how to change the values of ACMS parameters with the ACMSGEN Utility, independent of the ACMSPARAM.COM command procedure. The second part of the chapter provides reference information for the ACMSGEN Utility commands.
Chapter 12, "Auditing Applications with the Audit Trail Logger"	Explains how to get information about application and user activity by using the Audit Trail Report (ATR) Utility.
Chapter 13, "Logging Software Events"	Describes the ACMS Software Event Logger (SWL), which logs ACMS internal software errors. It also describes how to generate SWL reports by using the ACMS Software Event Log Utility Program(SWLUP).
Chapter 14, "Tuning Your Application"	Describes the major issues in ACMS application performance, ACMS components that affect system performance, and tools for monitoring an ACMS system, and also provides a tuning checklist.
Chapter 15, "Using DECtrace with ACMS Applications"	Describes the use of DECtrace for collecting event-based data gathered from ACMS applications.
Chapter 16, "Managing ACMS Licensing"	Describes the kits and licenses available in ACMS. It also describes how to manage ACMS systems with concurrent-use licenses, unlimited-use licenses, or both.

Part II, "Reference Section"	
Chapter 17, "DDU Commands"	Provides reference information for DDU commands.
Chapter 18, "UDU Commands"	Provides reference information for UDU commands.
Chapter 19, "AAU Commands"	Provides reference information for AAU commands.
Chapter 20, "ACMSQUEMGR Commands"	Provides reference information for ACMSQUEMGR Utility commands.
Chapter 21, "Operator Commands"	Provides reference information for ACMS operator commands.
Chapter 22, "ACMSGEN Commands"	Provides reference information for ACMSGEN Utility commands.

Chapter 23, "ATR Commands"	Provides reference information for ATR Utility commands.
Chapter 24, "SWLUP Commands"	Provides reference information for SWLUP commands.

Appendixes	
Appendix A, "Parameter and Quota Calculations"	Describes the formulas used in the calculation of various parameters and quotas by ACMSPARAM.COM and ACMEXCPAR.COM, as well as further calculations that can be made to fine-tune the system.
Appendix B, "Error Messages"	Explains how error message codes are returned by ACMS for the ACMS application management utilities and for messages returned at run time.
Appendix C, "Requirements for Successful ACMS Sign-Ins"	Gives guidelines to ensure successful user logins.

4. ACMS Help

ACMS and its components provide extensive online help.

- DCL level help

  Enter **HELP ACMS** at the DCL prompt for complete help about the **ACMS** command and qualifiers, and for other elements of ACMS for which independent help systems do not exist. DCL level help also provides brief help messages for elements of ACMS that contain independent help systems (such as the ACMS utilities) and for related products used by ACMS (such as DECforms or Oracle CDD/Repository).

- ACMS utilities help

  Each of the following ACMS utilities has an online help system:

  - ACMS Debugger ACMSGEN Utility
  - ACMS Queue Manager (ACMSQUEMGR)
  - Application Definition Utility (ADU)
  - Application Authorization Utility (AAU)
  - Device Definition Utility (DDU)
  - User Definition Utility (UDU)
  - Audit Trail Report Utility (ATR)
  - Software Event Log Utility Program (SWLUP)

  The two ways to get utility-specific help are:

  - Run the utility and type **HELP** at the utility prompt.

- Use the DCL **HELP** command. At the "Topic?" prompt, type **@** followed by the name of the utility. Use the ACMS prefix, even if the utility does not have an ACMS prefix (except for SWLUP). For example:

  ```
  Topic? @ACMSQUEMGR
  Topic? @ACMSADU
  ```

  However, do not use the ACMS prefix with SWLUP:

  ```
  Topic? @SWLUP
  ```

Note

Note that if you run the ACMS Debugger Utility and then type **HELP**, you must specify a file. If you ask for help from the DCL level with **@**, you do not need to specify a file.

- ACMSPARAM.COM and ACMEXCPAR.COM help

  Help for the command procedures that set parameters and quotas is a subset of the DCL level help. You have access to this help from the DCL prompt, or from within the command procedures.

- LSE help

  ACMS provides ACMS-specific help within the LSE templates that assist in the creation of applications, tasks, task groups, and menus. The ACMS- specific LSE help is a subset of the ADU help system. Within the LSE templates, this help is context-sensitive. Type **HELP/IND (PF1-PF2)** at any placeholder for which you want help.

- Error help

  ACMS and each of its utilities provide error message help. Use **HELP ACMS ERRORS** from the DCL prompt for ACMS error message help. Use **HELP ERRORS** from the individual utility prompts for error message help for that utility.

- Terminal user help

  At each menu within an ACMS application, ACMS provides help about terminal user commands, special key mappings, and general information about menus and how to select tasks from menus.

- Forms help

  For complete help for DECforms or TDMS, use the help systems for these products.

5. Related Documents

The following table lists the documents in the VSI ACMS for OpenVMS documentation set.

ACMS Information	Description
VSI ACMS Version 5.0 for OpenVMS Installation Guide [https://docs.vmssoftware.com/vsi-acms-installation-guide/]	Description of installation requirements, the installation procedure, and postinstallation tasks.

ACMS Information	Description
VSI ACMS for OpenVMS Getting Started [https://docs.vmssoftware.com/vsi-acms-get-started-guide/]	Overview of ACMS software and documentation. Tutorial for developing a simple ACMS application. Description of the AVERTZ sample application.
VSI ACMS for OpenVMS Concepts and Design Guidelines [https://docs.vmssoftware.com/vsi-acms-concepts-and-design-guide/]	Description of how to design an ACMS application.
VSI ACMS for OpenVMS Writing Applications [https://docs.vmssoftware.com/vsi-acms-writing-apps/]	Description of how to write task, task group, application, and menu definitions using the Application Definition Utility. Description of how to write and migrate ACMS applications on an OpenVMS system.
VSI ACMS for OpenVMS Writing Server Procedures [https://docs.vmssoftware.com/vsi-acms-writing-server-proc/]	Description of how to write programs to use with tasks and how to debug tasks and programs.
VSI ACMS for OpenVMS Systems Interface Programming [https://docs.vmssoftware.com/vsi-acms-sys-interface-prog/]	Description of using Systems Interface (SI) Services to submit tasks to an ACMS system.
VSI ACMS for OpenVMS ADU Reference Manual [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/]	Reference information about the ADU commands, phrases, and clauses.
VSI ACMS for OpenVMS Quick Reference [https://docs.vmssoftware.com/vsi-acms-quick-ref/]	List of ACMS syntax with brief descriptions.
VSI ACMS for OpenVMS Managing Applications [https://docs.vmssoftware.com/vsi-acms-managing-applications/]	Description of authorizing, running, and managing ACMS applications, and controlling the ACMS system.
VSI ACMS for OpenVMS Remote Systems Management Guide [https://docs.vmssoftware.com/vsi-acms-remote-systems-management-guide/]	Description of the features of the Remote Manager for managing ACMS systems, how to use the features, and how to manage the Remote Manager.
Online help	Online help about ACMS and its utilities.

6. OpenVMS Documentation

The full VSI OpenVMS documentation set can be found on the VMS Software Documentation webpage at https://docs.vmssoftware.com.

7. VSI Encourages Your Comments

You may send comments or suggestions regarding this manual or any VSI document by sending electronic mail to the following Internet address: <docinfo@vmssoftware.com>. Users who have VSI OpenVMS support contracts through VSI can contact <support@vmssoftware.com> for help with this product.

8. Conventions

The following conventions may be used in this manual:

Ctrl/*x*	A sequence such as **Ctrl/*x*** indicates that you must press and hold the key labeled Ctrl while you press another key or a pointing device button.
PF1 *x*	A sequence such as **PF1 *x*** indicates that you must first press and release the key labeled PF1 and then press and release another key or a pointing device button.
Return	In the HTML version of this document, this convention appears as brackets rather than a box.
. . .	A horizontal ellipsis in examples indicates one of the following possibilities: • Additional optional arguments in a statement have been omitted. • The preceding item or items can be repeated one or more times. • Additional parameters, values, or other information can be entered.
⋮	A vertical ellipsis indicates the omission of items from a code example or command format; the items are omitted because they are not important to the topic being discussed.
`Monospace text`	Monospace type indicates code examples and interactive screen displays. In the C programming language, monospace type in text identifies the following elements: keywords, the names of independently compiled external functions and files, syntax summaries, and references to variables or identifiers introduced in an example. In the HMTL version of this document, this text style may appear as italics.
-	A hyphen at the end of a command format description, command line, or code line indicates that the command or statement continues on the following line.
numbers	All numbers in text are assumed to be decimal unless otherwise noted. Nondecimal radixes—binary, octal, or hexadecimal—are explicitly indicated.
bold text	Bold text represents the introduction of a new term or the name of an argument, an attribute, or a reason. In the HMTL version of this document, this text style may appear as italics.
italic text	Italic text indicates important information, complete titles of manuals, or variables. Variables include information that aries in system output (Internal error *number*), in command lines (**`/PRODUCER=`*`name`***), and in command parameters in text (where *dd* represents the predefined code for the device type).
UPPERCASE	Uppercase text indicates the name of a routine, the name of a file, the name of a file protection code, or the abbreviation for a system

	privilege. In command format descriptions, uppercase text is an optional keyword.
UPPERCASE	In command format descriptions, uppercase text that is underlined is required. You must include it in the statement if the clause is used.
lowercase	In command format descriptions, a lowercase word indicates a required element.
<lowercase>	In command format descriptions, lowercase text in angle brackets indicates a required clause or phrase.
( )	In command format descriptions, parentheses indicate that you must enclose the options in parentheses if you choose more than one.
[| |]	In command format descriptions, vertical bars within square brackets indicate that you can choose any combination of the enclosed options, but you can choose each option only once.
{ | | }	In command format descriptions, vertical bars within braces indicate that you must choose one of the options listed, but you can use each option only once.

9. References to Oracle Products

VSI ACMS documentation set, to which this document belongs, refers to the following Oracle products by their full and abbreviated names:

Full product name	**Shortened product name**
Oracle Common Data Dictionary	CDD
Oracle Rdb	Rdb
Oracle Database/DBMS	DBMS
Oracle Trace	Trace

Part I. Managing the ACMS System and ACMS Applications

This part of the manual contains information about managing the ACMS system and its components. *Part I, "Managing the ACMS System and ACMS Applications"* also contains information about authorizing, installing, running, and monitoring ACMS applications. In addition, it provides information on system tuning and describes how to set up your ACMS system for distributed processing.

Chapter 1. Introduction to Application Management

The ACMS software helps you develop, use, and maintain online applications. Once you define and test an ACMS application, you can make it available to users. Before users can run tasks in the application, you must authorize the users and their terminals for access to ACMS. You can also optionally authorize ACMS applications and the users who can install them. Finally, you can start the ACMS system and applications.

These activities are all part of managing ACMS applications. Other aspects of managing ACMS applications include:

- Maintaining the security of applications
- Controlling their day-to-day operation
- Monitoring applications
- Managing ACMS task queues and queued task elements
- Tuning the ACMS system

This guide discusses the work involved in managing ACMS applications and the tools ACMS provides for this work. Practice using the ACMS management tools discussed in this book by installing and running the ACMS sample application.

See *Chapter 9, "Installing and Managing Applications"* for information about how to install and manage ACMS applications.

This manual does not discuss using the ACMS Remote Manager to manage ACMS systems remotely across a network. For information about managing ACMS systems remotely across a network, see the *VSI ACMS for OpenVMS Remote Systems Management Guide* [https://docs.vmssoftware.com/vsi-acms-remote-systems-management-guide/] in the ACMS documentation set.

1.1. ACMS Authorization Tools

When many users share one OpenVMS system, it is important for the ACMS system manager to control the facilities to which each user has access. For example, some users' jobs require access only to ACMS, while others require access to OpenVMS as well as ACMS.

The five tools that the system manager uses to authorize access to ACMS are:

- The OpenVMS Authorize Utility authorizes users to log in to OpenVMS. All ACMS users must be authorized OpenVMS users, whether they log in to OpenVMS or directly in to ACMS.
- The ACMS User Definition Utility (UDU) controls who can sign in to ACMS and whether a user receives a menu or just a selection prompt after signing in. The system manager must also use UDU to define the user name of ACMS processes. See *Chapter 3, "Authorizing Users"* for information about UDU.
- The ACMS Device Definition Utility (DDU) authorizes the terminals at which users can sign in to ACMS and controls whether a user signs in directly to ACMS, or logs in to OpenVMS and then ACMS. See *Chapter 2, "Authorizing and Controlling Terminals"* for information about DDU.

- The system manager can use the ACMS Application Authorization Utility (AAU) to authorize users to install applications in the directory associated with the logical name ACMS$DIRECTORY. See *Chapter 4, "Authorizing Applications"* for information about AAU.
- The Access Control List (ACL) subclause, used in the application definition, specifies by User Identification Code (UIC) or identifier which users can run certain tasks in an application. See *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/] for information on the ACCESS application-task subclause.

1.2. Controlling ACMS Operations

Controlling the overall operations of an ACMS system includes using the ACMS operator commands to:

- Install ACMS applications
- Set up terminals as ACMS operator terminals
- Control the ACMS system, including starting and stopping the system, and changing system characteristics
- Control the queued task initiator (QTI) and ACMS task queues
- Control ACMS applications, including starting and stopping applications
- Enable and disable tasks
- Enable and disable application auditing
- Control the terminals from which users can sign in to ACMS by starting and stopping the terminal subsystem controller (TSC)
- Cancel tasks when necessary
- Cancel users when necessary
- Display system and application information

Most ACMS operator commands require the OpenVMS OPER privilege. The only commands that do not require the OPER privilege are the **ACMS/SHOW** commands and **ACMS/INSTALL**. See *Chapter 8, "Controlling the ACMS System"*, *Chapter 9, "Installing and Managing Applications"*, and *Chapter 21, "Operator Commands"* for more information on the ACMS operator commands.

1.3. Monitoring an ACMS System

ACMS supplies several monitoring tools to help observe the system and its users:

- The Audit Trail Logger gathers information about an active ACMS system (for example, system and application starts and stops, user sign-ins and sign-outs, processing errors, user task selections, task completions and task cancellations) and generates records of ACMS user and application activity. Use the Audit Trail Report (ATR) Utility to produce reports containing audit trail information. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about the ATL and the ATR Utility.
- The **ACMS/SHOW** commands display information about an active ACMS system and its applications. See *Chapter 21, "Operator Commands"* for information about the **ACMS/SHOW** commands.

- The Software Event Logger (SWL) reports internal software errors that occur during run time. Use the Software Event Log Utility Program (SWLUP) to generate reports containing SWL information. See *Chapter 13, "Logging Software Events"* for information about SWL and SWLUP.

1.4. Tuning an ACMS System

Normally, you set OpenVMS and ACMS system parameters and ACMS run-time process quotas after an installation or an upgrade, or when the ACMS system load changes with, for example, additional applications or users. Use the ACMSPARAM.COM and ACMEXCPAR.COM command procedures to set parameters and quotas.

After you are familiar with the requirements of your system, you might need to change some of the default system parameter values. For example, you might need to change the value set for the maximum number of users who can sign in to ACMS. You can make system parameter changes with the ACMSPARAM and ACMEXCPAR command procedures.

You can also use the ACMSGEN Utility to set or change ACMS parameters. However, the use of ACMSPARAM.COM is preferred because this command procedure automatically changes other parameters related to the ones you modify. ACMSGEN changes values of ACMS parameters similar to the way the OpenVMS SYSGEN Utility lets you change OpenVMS parameters.

You can use ACMSGEN parameters to control the ACMS TSC, the ACC, the CP, the EXC, and the QTI, as well as ACMS message services and workspace pools. These components start and control other ACMS components.

Chapter 14, "Tuning Your Application" discusses tuning considerations, monitoring tools, and ACMS components that affect ACMS performance. It also provides a tuning checklist. *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* and *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"* describe the ACMS system parameters in detail and explain how to change their values using the ACMSPARAM.COM and the ACMEXCPAR.COM procedures and the ACMSGEN Utility.

1.5. ACMS Application Management Tools

ACMS has several application management tools. *Table 1.1, "ACMS Application Management Tools"* lists the ACMS application management tools and tells you where you can find further details on each tool in this book.

Table 1.1. ACMS Application Management Tools

Management Tool	Function
ACMS Operator Commands	Perform standard operator functions such as starting and stopping the ACMS system, the TSC, and the QTI. Other operator commands allow you to start and stop ACMS applications and display application and system information. See *Chapter 8, "Controlling the ACMS System"*, *Chapter 9, "Installing and Managing Applications"*, and *Chapter 21, "Operator Commands"* for information.
ACMSGEN Utility	Changes the values of ACMS parameters. See *Chapter 11, "Changing ACMS Parameter Values*

Management Tool	Function
	with the ACMSGEN Utility" and *Chapter 22, "ACMSGEN Commands"* for information.
ACMSPARAM.COM and ACMEXCPAR.COM procedures	Change the values of OpenVMS and ACMS system parameters, and ACMS run-time process quotas. See *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* for information.
Application Authorization Utility (AAU)	Authorizes applications to be installed in the directory associated with the logical name ACMS $DIRECTORY. See *Chapter 4, "Authorizing Applications"* and *Chapter 19, "AAU Commands"* for information.
Audit Trail Report (ATR) Utility	Returns records of application and user activity. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* and *Chapter 23, "ATR Commands"* for information.
Device Definition Utility (DDU)	Authorizes ACMS terminals and, optionally, defines terminals to sign in directly to ACMS. See *Chapter 2, "Authorizing and Controlling Terminals"* and *Chapter 17, "DDU Commands"* for information.
Queue Manager Utility (ACMSQUEMGR)	Creates and manages ACMS task queues and queued task elements. See *Chapter 5, "Creating and Managing Queues"* and *Chapter 20, "ACMSQUEMGR Commands"* for information.
Software Event Log Utility Program (SWLUP)	Creates reports of selected events recorded by the Software Event Logger. See *Chapter 13, "Logging Software Events"* and *Chapter 24, "SWLUP Commands"* for information.
User Definition Utility (UDU)	Authorizes users to sign in to ACMS and assigns sign-in displays, including default menus, to ACMS users. See *Chapter 3, "Authorizing Users"* and *Chapter 18, "UDU Commands"* for information.

1.6. Learning to Manage an ACMS System

While running the sample applications, you learn to authorize users and terminals and how to start and stop the ACMS system by using ACMS operator commands. In addition, the sample applications help you learn how to:

- Perform other functions with the operator commands, such as enabling and disabling ACMS operator terminals or the Audit Trail Logger.
- Run the ATR Utility to examine an ACMS log report and to familiarize yourself with the **`LIST`** command and its qualifiers.
- Run the ACMSPARAM.COM and ACMEXCPAR.COM command procedures to familiarize yourself with ACMS system parameters and run-time process quotas.

It is recommended that you run the ACMS sample applications if you are a new ACMS user.

Chapter 2. Authorizing and Controlling Terminals

Authorized ACMS users must sign in from terminals that have been authorized for access to ACMS. This chapter describes how to use the ACMS Device Definition Utility (DDU) to authorize terminals by creating DDU device definitions. See *Section 2.14, "Summary of DDU Commands and Qualifiers"* for a summary of DDU commands and qualifiers. For reference information on the commands described in this chapter, refer to *Chapter 17, "DDU Commands"*.

2.1. How DDU Works

System managers use DDU commands and qualifiers to create a device authorization file (ACMSDDF.DAT) that contains authorizations for ACMS terminals. This information includes:

- Device name of the terminal. Use physical device names or group device names to authorize terminals. *Table 2.1, "DDU Group Device Names"* lists the DDU group device names.
- Terminal sign-in characteristics.

When a user tries to sign in to ACMS from a terminal, ACMS checks the ACMSDDF.DAT for a device definition for the user's terminal. If the authorization file does not contain a definition for that device, ACMS then checks for the group device name $ALL to see if *all* devices are authorized for ACMS access. If there is no $ALL definition, ACMS denies access to the terminal. See *Table 2.1, "DDU Group Device Names"* for more information about the $ALL group device name.

When the TSC is started, or when the ACMS operator command **ACMS/RESET TERMINALS** is issued, ACMS reads the device authorization file and establishes the sign-in characteristics for terminals. You can assign the following sign-in characteristics to ACMS terminals:

- Controlled or Not Controlled

  Users at application port terminals with the Controlled sign-in characteristic sign in directly to ACMS. Users at dedicated service port terminals sign in either directly to ACMS or not, depending on the node they connect to at the "Local>" prompt. See *Section 2.11, "Authorizing LAT Terminal Ports as Controlled Terminals"* for a description of application ports and dedicated service ports. A terminal with a Not Controlled characteristic has access to both OpenVMS and ACMS. See *Section 2.10, "Defining ACMS-Controlled Terminals"* for information on how to assign the **/[NO]CONTROLLED** sign-in characteristic.

- Autologin or No Autologin

  A terminal with the Autologin characteristic allows users to sign in without typing a user name. A terminal with the No Autologin characteristic requires that the user enter a user name before gaining access to ACMS. See *Section 2.5.1, "Enabling Autologin Terminals"* for information on how to assign the Autologin or No Autologin characteristic.

2.2. How to Run DDU

You can start DDU from DCL level by using either of the following commands:

```
$ RUN SYS$SYSTEM:ACMSDDU
```

```
DDU>
```

or

```
$ MCR ACMSDDU
DDU>
```

When you start DDU, ACMS displays the DDU prompt (DDU>). You can then enter any DDU command (including the DDU command **HELP** to get online help information) or press **PF1** and **PF2** for access to a keypad of DDU commands. Use **Ctrl/B** to recall each DDU command you enter. To exit from DDU, use the DDU command **EXIT**.

When you run DDU to authorize terminals, DDU searches for the device authorization file in your current default directory. If ACMSDDF.DAT does not exist, ACMS creates it and places it in your current default directory.

At run time, ACMS looks in SYS$SYSTEM by default to find the device authorization file. If you choose to place the authorization file in a directory other than SYS$SYSTEM, you must direct the ACMS system to that directory location by defining the executive mode system logical name ACMSDDF. You can define ACMSDDF as an executive mode system logical name with the DCL **DEFINE** command and the **/SYSTEM** and **/EXECUTIVE** qualifiers. The following command defines ACMSDDF to be the directory DISK1:[SMITH]. You need the SYSNAM privilege to execute this command.

```
$ DEFINE/SYSTEM/EXECUTIVE ACMSDDF DISK1:[SMITH]ACMSDDF.DAT
```

When you run DDU for the first time, ACMS creates a new device authorization file and assigns all devices the characteristics defined by the DDU DEFAULT definition. The initial DEFAULT definition contains the sign-in characteristics Not Controlled and No Autologin. Because of this default, if you use the DDU command **ADD** without qualifiers after running DDU for the first time, all new terminals have access to both OpenVMS and ACMS.

Since DDU only contains the default definition when you run DDU for the first time, you must authorize a terminal name or a group device name before users have access to the ACMS system.

You can change the sign-in characteristics in the DDU default definition by using the DDU command **DEFAULT**. The **DEFAULT** command is described in *Section 2.8, "DDU DEFAULT Definition"*.

2.3. Creating a DDU Definition

Authorize terminal access to ACMS by creating a DDU definition in the ACMSDDF.DAT. To create a new DDU definition, use the DDU command **ADD** and specify a device name. The **ADD** command creates a new DDU definition for the device in the device authorization file. Do not specify a colon at the end of device names. The following command authorizes terminal TTE6. When this command executes, DDU displays a message confirming that the device has been added to the device authorization file.

```
DDU> ADD TTE6
Device TTE6 has been added to the database
```

Instead of specifying a physical device name like TTE6 when you use the **ADD** command, you can quickly create authorizations for all terminals by specifying the group device name $ALL. The $ALL device name is described in *Table 2.1, "DDU Group Device Names"*, with other DDU group device names.

Table 2.1. DDU Group Device Names

Device Name	Description
$ALL	Authorizes all terminals. If you create a $ALL definition, you do not need to create any LT, PT, RT, or VT definitions. The $ALL definition authorizes all of those types of terminals as well as any unauthorized local terminals. Restrict terminal access to ACMS by creating individual definitions instead of using the $ALL device name.
LT	Authorizes all LAT terminals. You *can* authorize individual LAT terminals.
PT	Authorizes all pseudoterminals. You should only use pseudoterminals when you run DEC/Test Manager (DTM) sessions. You *must* authorize the PT device name if you want to run ACMS tasks from DTM. You *cannot* authorize individual pseudo terminals.
RT	Authorizes all remote terminals. You *cannot* authorize individual remote terminals.
TT	Authorizes all local terminals. You *can* authorize individual local terminals.
VT	Authorizes all virtual terminals. You assign virtual terminals for your system with the OpenVMS SYSGEN Utility. You *cannot* authorize individual virtual terminals.

Display the device names and sign-in characteristics for authorized devices by specifying the DDU **SHOW** command. See *Section 2.9, "Displaying DDU Definitions"* for information on the **SHOW** command as well as an example of the output from the **SHOW** command.

2.4. Copying DDU Definitions

When a definition already exists with characteristics similar to a definition you want to create, you can use the DDU command **COPY** to create a new definition based on information in an existing DDU definition. The following command authorizes all local terminals using the device definition for terminal TTB6. When this command executes, DDU displays a message confirming that the device definition has been copied.

```
DDU> COPY TTB6 TT
Device TTB6 has been copied to device TT
```

The first device name you specify with the **COPY** command is the name of the device in the existing device definition. The second device name is the name of the new device. A device name can be a logical name, a physical device name, or a group device name. See *Table 2.1, "DDU Group Device Names"* for a list of DDU group device names. See *Chapter 17, "DDU Commands"* for more information on the **COPY** command.

2.5. Modifying DDU Definitions

Use the DDU **MODIFY** command to change the login characteristics in a device definition. The following subsections explain how to enable Autologin and how to use the **/PRINTFILE** qualifier.

2.5.1. Enabling Autologin Terminals

The following command modifies terminal TTE6 so that it is an ACMS-controlled terminal with Autologin enabled. TURKLES is the user name used for automatic login. When this command executes, DDU displays a message confirming that the device definition has been modified.

```
DDU> MODIFY TTE6 /CONTROLLED /AUTOLOGIN=TURKLES
Device(s) has been modified
```

When users press the **Return** on terminal TTE6, they are prompted for a password (if a password is required) and are logged in to ACMS under the user name TURKLES. The device name you specify with the **MODIFY** command can be a logical name, a physical device name, or a group device name.

2.5.2. Using the /PRINTFILE Qualifier

The **/PRINTFILE** qualifier feature provides hardcopy capability for DECforms panels. In other words, DECforms allows users to send a copy of one or more panel displays to a printer or to a file for subsequent printing. Using DDU, you can specify a Printfile device or file for a terminal. If you specify a device, then it must be a spooled device. Specifying a Printfile for a user is explained in *Chapter 3, "Authorizing Users"*.

To use the **/PRINTFILE** qualifier to specify a device or a file name:

1. Use a DECforms PRINT response step in a form source IFDL file wherever a response step can be used; for example, you can place it in a field exit response or in a panel exit response. You can also define a key that the user can press to issue the PRINT response. See *VSI DECforms Programmer's Reference Manual* [https://docs.vmssoftware.com/vsi-decforms-for-openvms-programmer-s-reference-manual/] for details about response steps and key definitions.

   Note

   If you do not enter a **/PRINTFILE** qualifier either for a device (using DDU) or for a user (with UDU), DECforms nevertheless creates a file if a user presses the key associated with the PRINT response. DECforms names the file form-name.TXT and places it in the default directory of the agent program.

   ---

2. To use the **/PRINTFILE** qualifier to specify a printfile name or a spooled device, you use the DDU **MODIFY** command, the device name, the **/PRINTFILE** qualifier, and the name of the spooled device or printfile specification:

   ```
   DDU> MODIFY <device-name> /PRINTFILE=<spooled-device-name>
   ```

   or

   ```
   DDU> MODIFY <device-name> /PRINTFILE=<print-file-spec>
   ```

   Following is an example of how you might enter the command for a spooled device:

   ```
   DDU> MODIFY TTE5 /PRINTFILE=SPOOLDEV::TXA0:
   ```

   According to the instructions in the preceding example, ACMS modifies the record for the terminal TTE5 in ACMSDDU.DAT to specify that DECforms panel screens are to be output on spooled device SPOOLDEV::TXA0:.

3. After you modify an ACMSDDU.DAT record, use the **SHOW** command, followed by the device name. DDU displays the **/PRINTFILE** specification that you have entered, for example:

```
DDU> SHOW TTE5
Device Name:          TTE5          NOT CONTROLLED
No Autologin
Printfile:       SPOOLDEV::TXA0:
```

See *Table 2.1, "DDU Group Device Names"* for a list of DDU group device names. See *Chapter 17, "DDU Commands"* for more information on the **MODIFY** command.

2.6. Renaming Device Names in DDU Definitions

Change the device name in a DDU definition by using the **RENAME** command. The following command changes the device name of terminal TTE6 to TTE7. DDU displays a confirmation message when the device name is renamed.

```
DDU> RENAME TTE6 TTE7
Device TTE6 has been renamed to device TTE7
```

A device name can be a logical name, a physical device name, or a group device name. See *Table 2.1, "DDU Group Device Names"* for a list of DDU group device names.

Change the login characteristics of a device by using the **/[NO]CONTROLLED** and **/[NO]AUTOLOGIN** qualifiers with the **RENAME** command. See *Section 2.10, "Defining ACMS-Controlled Terminals"* and *Section 2.5.1, "Enabling Autologin Terminals"* for descriptions of these qualifiers.

You cannot use the **RENAME** command to modify the default DDU definition. See *Chapter 17, "DDU Commands"* for more information on the **RENAME** command.

2.7. Removing DDU Definitions

If you want to restrict a terminal from accessing ACMS, use the **REMOVE** command to remove its device definition from the DDU authorization file. The **REMOVE** command deletes the device definition and displays a message confirming the deletion. The following command removes the DDU definitions for all LAT terminals:

```
DDU> REMOVE LT
Device LT has been removed from the database
```

A device name can be a logical name, a physical device name, or a group device name. See *Table 2.1, "DDU Group Device Names"* for a list of DDU group device names. See *Chapter 17, "DDU Commands"* for more information on the **REMOVE** command.

2.8. DDU DEFAULT Definition

The DDU command **DEFAULT** changes information in the DDU default definition. When you use the **ADD** command without any qualifiers, all new terminals receive the characteristics defined in the DDU default definition. The **ADD** command is the only command affected by the DDU default definition.

The first time you run DDU, the DDU default definition specifies that terminals receive the Not Controlled and No Autologin sign-in characteristics. You can use the **/[NO]CONTROLLED**,

/[NO]AUTOLOGIN, and **/PRINTFILE** qualifiers with the **DEFAULT** command to change characteristics in the default definition.

The following **DEFAULT** command changes the DDU default definition so that new terminals receive the Controlled sign-in characteristic. You can use the **/NOCONTROLLED** qualifier to override the default definition. DDU displays a confirmation message when this command executes.

```
DDU> DEFAULT/CONTROLLED
Device(s) has been modified
```

You can display the sign-in characteristics currently defined in the DDU default definition by using the DDU command **SHOW** and specifying DEFAULT as a device name. For example:

```
DDU> SHOW DEFAULT
Device Name:       DEFAULT          CONTROLLED
No Autologin
Printfile:
```

The output display tells you that the default sign-in characteristics are Controlled, No Autologin, and No Printfile. All new terminals added with the **ADD** command without qualifiers are designated as ACMS-controlled terminals with automatic sign-ins disabled and No Printfile.

See *Section 2.9, "Displaying DDU Definitions"* and *Chapter 17, "DDU Commands"* for more information about the **SHOW** command.

2.9. Displaying DDU Definitions

When you add or change device information, you can verify the terminal names and sign-in characteristics in the device authorization file with the DDU **SHOW** command. Specify a device name with the **SHOW** command to display all definitions that contain a particular device name, or use the wildcard character (*) to display all current DDU definitions. *Example 2.1, "DDU SHOW Command"* shows the output from the **SHOW** command.

Example 2.1. DDU SHOW Command

```
DDU> SHOW *
Device Name:            $ALL            NOT CONTROLLED
Printfile:

Device Name:            DEFAULT         CONTROLLED
No Autologin
Printfile:

Device Name:            LT              NOT CONTROLLED
No Autologin
Printfile:

Device Name:            LTA12           CONTROLLED
Autologin Username:     SMITH
Printfile:

Device Name:            TT              NOT CONTROLLED
No Autologin
Printfile:
```

```
Device Name:            TTE5            NOT CONTROLLED
No Autologin
Printfile:       SPOOLDEV::TXA0:

Device Name:            TTE6            CONTROLLED
Autologin Username:     TURKLES
Printfile:

Device Name:            VTA65           NOT CONTROLLED
No Autologin
Printfile:
```

The **SHOW** command displays the name of the device, the sign-in characteristic of the device (whether it is controlled or not controlled), whether the autologin option was chosen for sign-in, whether a Printfile option was used and, if so, which one: print-file-spec or spooled-device-name. If the autologin option was chosen for sign-in, the user name used for automatic sign-in also appears.

To have the device information written to a file instead of displayed on a terminal, use the DDU command **LIST**. See *Chapter 17, "DDU Commands"* for more information about the **LIST** and **SHOW** commands.

2.10. Defining ACMS-Controlled Terminals

You can define local and LAT terminals as ACMS-controlled terminals. Specify the **/CONTROLLED** qualifier with the **ADD**, **COPY**, **DEFAULT**, **MODIFY**, or **RENAME** commands to control ACMS terminals. The **/CONTROLLED** qualifier assigns the sign-in characteristic Controlled to a terminal.

The following **ADD** command creates a device definition with the Controlled sign-in characteristic for local terminal TTE6:

```
$ RUN SYS$SYSTEM:ACMSDDU
DDU> ADD TTE6 /CONTROLLED
Device TTE6 has been added to the database
DDU> EXIT
$
```

The following **ADD** command creates a device definition with the Controlled sign-in characteristic for LAT terminal LTA11:

```
$ RUN SYS$SYSTEM:ACMSDDU
DDU> ADD LTA11 /CONTROLLED
Device LTA11 has been added to the database
DDU> EXIT
$
```

You can only use the **/CONTROLLED** qualifier with physical device names or the group device names LT or TT. You receive an error if you use the **/CONTROLLED** qualifier for definitions with the group device names $ALL, PT, RT, and VT.

To release a terminal from ACMS control, use the **/NOCONTROLLED** qualifier with the **MODIFY** command. See *Section 2.5, "Modifying DDU Definitions"* for information about the **MODIFY** command.

ACMS makes use of login features set by the OpenVMS **AUTHORIZE** command. *Table 2.2, "OpenVMS AUTHORIZE Qualifiers Affecting Sign-in to ACMS-Controlled Terminals"* lists the **AUTHORIZE** qualifiers affecting sign-in to ACMS-controlled terminals.

Table 2.2. OpenVMS AUTHORIZE Qualifiers Affecting Sign-in to ACMS-Controlled Terminals

Qualifier	Description
/PASSWORD=(*password1* [,*password2*])	Allows for processing of multiple passwords.
/FLAGS=DISUSER	Disables account.
/EXPIRATION=*time*	Sets user account expiration.
/ACCESS	Checks user day and hour restrictions.
/FLAGS=DISREPORT	Disables the display of the last date and time of interactive and non-interactive sign-ins. Also disables the display of the number of failed sign-ins since the last successful sign-in.
/FLAGS=DISNEWMAIL	Disables the display of the number of new mail messages.

2.11. Authorizing LAT Terminal Ports as Controlled Terminals

You can use DDU to authorize two types of LAT terminal ports as controlled terminals:

- Application ports

  With an application port, control passes to ACMS as soon as a key is pressed.

- Dedicated service ports

  With a dedicated service port, control passes at the connection to the dedicated service associated with ACMS.

Use LATCP to create both application ports and dedicated service ports. Application ports are mapped directly to a physical port on a specific terminal server, while dedicated service ports are mapped to a service name which may be available on a number of nodes. A dedicated service port does not necessarily map to any specific physical terminal port. Rather, a physical terminal becomes associated with an available dedicated service port name (LTAn:) when that terminal's user connects to the service with which the port is associated (the service to which it is "dedicated ").

From a user perspective, there are two major differences between LAT application ports and dedicated service ports:

- User sign-in

  An application port which is an ACMS-controlled terminal requires only that the user press any typing key to begin signing in to ACMS. When using a dedicated service port as an ACMS-controlled terminal, the user must connect to a predetermined LAT service before pressing any key to begin the ACMS sign-in.

- Connections to other LAT services

  An application port which is an ACMS-controlled terminal gives access only to ACMS. With a dedicated service port, the terminal can be used for purposes other than ACMS application. The user

can connect to other LAT services and the terminal is only controlled by ACMS if the user connects to the LAT service being used by ACMS.

When deciding which type of LAT terminal to use as an ACMS-controlled terminal, there are two major factors to consider:

- Availability

  If the terminal server to which a controlled terminal (application port) is connected suffers a power failure, that terminal can not function again as a controlled terminal until **ACMS/STOP TERMINALS** and **ACMS/START TERMINALS** commands are issued. This means that all ACMS terminal users have to be interrupted before those affected by the power failure can continue working.

  In contrast, dedicated service ports continue to be available as controlled terminals as soon as the terminal server has recovered from the power failure; no intervention is required. If this kind of availability is an important issue, dedicated service ports would be the best choice.

- Versatility

  When an application port is an ACMS-controlled terminal, it cannot be used for anything else. To do so would require "uncontrolling " it by setting the **/NOCONTROLLED** attribute in ACMSDDU and issuing the **ACMS/RESET TERMINALS** command. Dedicated service ports, however, are not actually controlled by ACMS in the same sense that application ports are. A dedicated service port which is a controlled terminal behaves in the same way that an application port does once the user chooses to connect to the appropriate service. But the user can also connect to any other service which is available to the terminal server. As a result, dedicated service ports are a better choice if you wish to use the same terminal for ACMS and non-ACMS work on a regular basis. Conversely, application ports would be a better choice if you wish to restrict a terminal to ACMS use exclusively.

2.12. Controlling LAT Terminals

As described in *Section 2.10, "Defining ACMS-Controlled Terminals"*, you can use the **/CONTROLLED** qualifier to define LAT terminals as ACMS-controlled terminals. However, before you can control a LAT terminal, you must use the OpenVMS LAT Control Program (LATCP) Utility to define the terminal as an applications port or a dedicated service port and map the port to a terminal server. The following sections explain how to do this.

2.12.1. LAT Setup for an Applications Port

After you have used ACMSDDU to specify that certain terminals are controlled, take the following steps to define the terminal as an applications port:

1. Invoke the LATCP Utility and use the LATCP command **CREATE PORT** with the **/APPLICATION** qualifier to define the LAT terminal as an applications port. For example:

   ```
   $ RUN SYS$SYSTEM:LATCP
   LCP> CREATE PORT LTA11: /APPLICATION
   ```

2. Use the **SET PORT** command to map the LAT terminal to a port on the terminal server and then exit from the LATCP Utility:

   ```
   LCP> SET PORT LTA11: /APPLICATION /NODE=SAILS /PORT=PORT_1
   LCP> EXIT
   ```

This command specifies that the applications port LTA11 is associated with the port named PORT_1 on the server named SAILS.

3. To use a LAT terminal as an application port, you must set access on the corresponding physical port to remote. Use the **SHOW PORT** command at the terminal server's "Local > " prompt to determine the access type of the LAT terminal at which you are working. If your terminal is defined as a local or dynamic LAT terminal, you must redefine your terminal to be remote by using the **DEFINE PORT** command. This command is a privileged LAT command that requires you to use the **SET PRIVILEGED** command and enter the server's privileged password to enable LAT privileges.

   Use the following commands to define your port to be remote:

   ```
   Local> SHOW PORT
   Local> SET PRIVILEGED
   Password>
   Local> DEFINE PORT <port-number> ACCESS REMOTE
   ```

4. Use the DCL **SET TERMINAL** command to set the device type of the terminal and the **ACMS/RESET TERMINALS** command to set the new terminal characteristics:

   ```
   $ SET TERMINAL LTA11 /PERM /DEVICE=VT200
   $ ACMS/RESET TERMINALS
   ```

   LTA11 can now be used as an ACMS-controlled terminal. See *VSI Console Management for OpenVMS Administration Guide* [https://docs.vmssoftware.com/vsi-console-management-administration-guide/] for more information about LAT terminals.

Instead of using this sequence of commands to define LAT terminals each time you start OpenVMS, you can create a command file of LATCP Utility commands. Create a file called LAT$SYSTARTUP.COM in SYS$MANAGER, and include the commands. OpenVMS provides you with a template LAT definition command file, LAT$SYSTARTUP.TEMPLATE, which is copied to SYS$MANAGER when you install OpenVMS.

2.12.2. LAT Setup for a Dedicated Service Port

Creating a LAT dedicated service port involves the following steps, which are discussed in the following sections:

- Setup of the terminal server port (using terminal server local mode at the "Local > " prompt)
- Creation of a service (using LATCP)
- Creation of dedicated service ports (using LATCP)
- Association of the dedicated service with the desired service (using LATCP)

2.12.2.1. Setup of the Terminal Server Port

Dedicated service ports which are used as ACMS-controlled terminals should be placed in local access mode:

```
Local> SHOW PORT
Local> SET PRIVILEGED
```

```
Password>
Local> DEFINE PORT <port-number> ACCESS LOCAL
```

See *Section 2.12.1, "LAT Setup for an Applications Port"* for a description of **DEFINE PORT**.

You may want to make the service which will be used for dedicated service port connections the preferred service for a LAT terminal which will be controlled by ACMS. Once the preferred service attribute is in effect, the specified service becomes the default parameter of the LAT **CONNECT** command. This means that the ACMS user can connect to an ACMS application by following this sequence:

1. Enter the **CONNECT** command at the "Local > " prompt
2. Press **Return**
3. Press any typing key

This minimizes the difference between the two types of controlled terminals. Preferred service setup is accomplished with the following commands:

```
Local> SET PORT <port-number> PREFERRED <service name>
Local> DEFINE PORT <port-number> PREFERRED <service name>
```

The **SET PORT** command takes effect immediately and lasts only until the current user logs out of the terminal server. If you wish to make any port attribute last beyond the current login, you must also use the **DEFINE PORT** command.

As a further convenience to the ACMS user, you may wish to enable the Autoconnect port attribute. This has two results:

- When a new LAT login is initiated, the terminal server will automatically attempt to connect to the preferred service (if one has been defined).
- If the user attempts to connect to any service which is not currently available, the terminal server will periodically attempt to connect to that service for the user.

The LAT commands used to enable the Autoconnect attribute are:

```
Local> SET PORT <port-number> AUTOCONNECT ENABLED
Local> DEFINE PORT <port-number> AUTOCONNECT ENBABLED
```

2.12.2.2. Creation of a Service

Terminal servers make various nodes or applications running on those nodes available to all the terminals connected to the server. A node or application known to a terminal server is called a LAT service.

Note

An "application " LAT service could be ACMS, not to be confused with an application within ACMS.

Dedicated service ports must be associated with a LAT service before they can be used. The following LATCP command creates a service named ACMS_SERVICE:

```
LCP> CREATE SERVICE /APPLICATION ACMS_SERVICE
```

The service type (APPLICATION) and service name (ACMS_SERVICE) will be referred to later when setting up dedicated service ports in LATCP. You can also associate a dedicated service port with a service which is a node. This can create complications for other LAT terminal users on the node in question, however, and is not recommended for that reason. For example, if you associate a node name with a dedicated service port and not all dedicated service ports are currently in use, no one will be able to connect to that node from the "Local > " prompt without ACMS controlling the terminal.

Care should be taken when creating service names on particular nodes. If a given service is defined on two different nodes known to the terminal server in use, connections will only complete to the node on which the service has the highest rating. If the ACMS Terminal Subsystem Controller (TSC) is not started on the node on which the connection is completed, no connection will occur (unless a program running on the node happens to have opened a channel to the terminal – in that case, the connection will be established and the terminal will be usable by that program). If the service is defined on different nodes with the same static rating, it is unpredictable which node will receive a given connection. Therefore, it is recommended that each service be defined on only one node unless ACMS (including TSC) will generally be started on all nodes on which the service is defined.

2.12.2.3. Creation of Dedicated Service Ports

It is important to understand that there is no direct correlation between a particular physical port on a DECserver and a dedicated service port created with LATCP. When a terminal connects to a service for which dedicated service ports exist, that terminal becomes associated with an available dedicated service port name for the duration of the connection. Typically, there will be a many-to-one mapping between dedicated service ports and a service name.

If a direct correspondence between physical ports and dedicated service ports is desired, it can only be achieved by creating a service for each port, and connecting to only that service when using the given terminal.

The names of dedicated service ports must be of the form LTAn:, where n is a number. One such port name should be created for each terminal which is to be used as a controlled dedicated service port. To do this, use the following command:

```
LCP> CREATE PORT LTAn: /DEDICATED
```

2.12.2.4. Association of the Dedicated Service Port with the Desired Service

Once a dedicated service port has been created, it must be associated with a service before it can be used. This is done with the LATCP **SET PORT** command:

```
LCP> SET PORT LTAn: /DEDICATED/SERVICE=<service name>
```

Note that the **/SERVICE** qualifier cannot be used with the **CREATE PORT** command.

2.12.2.5. Terminal Setup

Once a dedicated service port has been created, its terminal type should be identified on the node to which it will connect. For example, if LTA1 is a VT300, the following command should be entered:

```
$ SET TERMINAL LTA1: /DEVICE=VT300/PERMANENT
```

This should be done for all dedicated service ports when they are created in LATCP. It is possible (and most probably desirable) to create dedicated service ports, associate them with a service, and set the terminal type using DCL command procedure(s).

2.12.2.6. Using a Dedicated Service Port

Before a dedicated service port can be used as an ACMS-controlled terminal, the user must connect to the correct service. When the connect command has been issued at the " Local> " prompt, one of three responses should occur. If the connection is possible, the following message will be displayed:

```
Local -010- Session 1 to ACMS_CT on node ORANGE established
```

This assumes that this is the user's only current connection and that the service name is ACMS_CT on node ORANGE.

At this point, TSC will begin listening for a keystroke at the terminal. When one is detected, the process of signing the terminal in to ACMS will proceed in the same way as it does for application ports.

If the service is known but a connection could not be established, the following message will be displayed:

```
Local -011- Connection to ACMS_CT not established
            Insufficient Node resources
```

This message is displayed when there are no channels open to the dedicated service port on the node with which LAT attempted to establish a connection. In some cases, it is normal to see this message after a hangup occurs; this is because of a necessary delay in opening a new channel to the terminal.

If repeated attempts to connect result in this message, the ACMS terminal subsystem may need to be started on that node. Because the message can be displayed for a variety of reasons, the system manager or person in charge of managing the ACMS application should be notified.

If the connection cannot be connected because the service has not been created, the following message will be displayed:

```
Local -711- Service ACMS_CT not known
```

If this occurs, refer to the instructions for creating services with LATCP.

A dedicated service port user signs out of ACMS exactly as if using an application port. The only difference is that a dedicated service port will return the user to the "Local > " prompt; with an application port, TSC would display a logout message and immediately begin listening again.

The following example illustrates all the steps involved in setting up dedicated service ports for use as ACMS-controlled terminals. A new service is created for controlled terminal connections, and three ports dedicated to the new service are created. Terminal output from LATCP and ACMSDDU is omitted.

Note that with the exception of the ACMSDDU portion, all of these actions need to be taken each time the system is booted. As a result, it is recommended that they be included in a system startup command procedure, such as the following:

```
$!
$! Create service and ports in LATCP
$!
$ RUN SYS$SYSTEM:LATCP
LCP> CREATE SERVICE /APPLICATION ACMS_CT
LCP> CREATE PORT LTA101: /DEDICATED
LCP> SET PORT LTA101: /DEDICATED/SERVICE=ACMS_CT
LCP> CREATE PORT LTA102: /DEDICATED
```

```
LCP> SET PORT LTA102: /DEDICATED/SERVICE=ACMS_CT
LCP> CREATE PORT LTA103: /DEDICATED
LCP> SET PORT LTA103: /DEDICATED/SERVICE=ACMS_CT
LCP> EXIT
$!
$! Define terminal device type
$!
$ SET TERM LTA101: /DEV=VT300/PERM
$ SET TERM LTA102: /DEV=VT300/PERM
$ SET TERM LTA103: /DEV=VT300/PERM
$!
$! Authorize terminals in ACMSDDU
$!
$ RUN SYS$SYSTEM:ACMSDDU
DDU>ADD LTA101: /CONTROLLED
DDU>ADD LTA102: /CONTROLLED
DDU>ADD LTA103: /CONTROLLED
DDU>EXIT
$!
$! Terminals LTA101:, LTA102: and LTA103: are now ready for use
$!
```

The following is an example of what the user sees when using a dedicated service port as an ACMS-controlled terminal.

If the terminal is not logged in to the terminal server, the user should press **Return** twice. A display similar to this will appear:

```
DECserver 200 Terminal Server V3.0 (BL31) - LAT V5.1

Please type HELP if you need assistance

Enter username>
```

At the username prompt, the user should enter a string (this is not subject to any verification) and press **Return**.

If the autoconnect attribute has been enabled for the user's port, the terminal server will immediately attempt to connect to any preferred service that may have been defined; otherwise, the user must connect to the appropriate service (in this example, we assume that the service name for ACMS sign-ins is ACMS_CT).

If ACMS_CT is the preferred service, the following will suffice:

```
Local> CONNECT
```

If ACMS_CT is not the preferred service, the user must enter:

```
Local> CONNECT ACMS_CT
```

The connection will be established or fail, accompanied by the messages detailed earlier.

Between the time the LAT connection is established and when the user signs out of ACMS, there is no visible difference between the types of LAT terminals. In both cases, the user presses any typing key in order to begin signing in to ACMS. A prompt for user name and password may or may not follow, depending on how the user's account and ACMS authorization are defined.

When the user signs out of ACMS, control will be returned to the terminal server's "Local > " prompt.

2.13. Enabling Automatic User Sign-ins

Use the **/AUTOLOGIN** qualifier with the **ADD**, **COPY**, **DEFAULT**, **MODIFY** or **RENAME** commands to allow users of ACMS-controlled terminals to sign in directly to ACMS without typing a user name. When a user presses **Return** on an ACMS-controlled terminal with Autologin enabled, ACMS retrieves the user name for that terminal from the device authorization file. If no password is required, the user is signed in automatically.

The **/AUTOLOGIN** qualifier enables automatic sign-ins for controlled terminals only. If a terminal has the Not Controlled sign-in characteristic, the Autologin characteristic has no effect; users must use the **ACMS/ENTER** command for access to ACMS from DCL as usual.

You can disable automatic sign-ins by using the **/NOAUTOLOGIN** qualifier. The **/NOAUTOLOGIN** qualifier is the default.

2.14. Summary of DDU Commands and Qualifiers

DDU commands allow you to display, create, modify, and remove device definitions stored in the DDU device authorization file. *Table 2.3, "Summary of DDU Commands"* lists the DDU commands and qualifiers and provides a brief description of each command. For more detailed information on a DDU command, see *Chapter 17, "DDU Commands"*.

Table 2.3. Summary of DDU Commands

Commands and Qualifiers	Description
ADD /[NO]AUTOLOGIN=*username* /[NO]CONTROLLED /PRINTFILE[=*print-file-spec/spooled-device-name*]	Authorizes and assigns sign-in characteristics to ACMS terminals by adding DDU definitions to the device authorization file. If you omit qualifiers, the new definition takes information from the DDU default definition.
COPY /[NO]AUTOLOGIN=*username* /[NO]CONTROLLED /PRINTFILE[=*print-file-spec/spooled-device-name*]	Authorizes and assigns sign-in characteristics to ACMS terminals by copying information from an existing DDU definition.
DEFAULT /[NO]AUTOLOGIN=*username* /[NO]CONTROLLED /PRINTFILE[=*print-file-spec/spooled-device-name*]	Changes information in the DEFAULT definition. If you omit qualifiers from the **ADD** command, the new definition takes information from the existing DDU default definition.
EXIT	Ends the DDU session and returns you to the DCL prompt.
HELP /[NO]PROMPT	Displays information about DDU commands, qualifiers, and parameters.
LIST /BRIEF /OUTPUT[=*file-spec*]	Writes DDU definitions to ACMSDDU.LIS in your default directory, or to the output file you specify.
MODIFY	Changes information in DDU definitions.

Commands and Qualifiers	Description
/[NO]AUTOLOGIN=*username* /[NO]CONTROLLED /PRINTFILE[=*print-file-spec/spooled-device-name*]	
REMOVE	Removes DDU definitions from the device authorization file.
RENAME /[NO]AUTOLOGIN=*username* /[NO]CONTROLLED /PRINTFILE[=*print-file-spec/spooled-device-name*]	Changes the device name and, optionally, the sign-in characteristic information in DDU definitions.
SHOW /BRIEF	Displays DDU definitions at your terminal.

Chapter 3. Authorizing Users

This chapter describes how to use the ACMS User Definition Utility (UDU) to create or change user definitions that UDU stores in the user authorization file (ACMSUDF.DAT). *Section 3.6, "Summary of UDU Commands and Qualifiers"* provides a summary of UDU commands and qualifiers. For reference information on the commands described in this chapter, refer to *Chapter 18, "UDU Commands"*.

3.1. How UDU Works

Use UDU commands and qualifiers to create a database user authorization file (ACMSUDF.DAT) that contains records of individual user information. Using UDU is similar to using the OpenVMS Authorize Utility. With UDU, you define the characteristics under which a user signs in to ACMS. These characteristics include:

- The name of the user
- Whether or not a user name can submit tasks to ACMS for other users
- Whether or not the user runs an initial task when signing in
- What the terminal screen displays upon sign-in: either a menu and a selection prompt, or just a selection prompt
- Which menu ACMS should display if the initial sign-in screen displays a menu
- Whether or not the user runs a final task when signing out

When a user tries to sign in to ACMS, ACMS checks the user authorization file for a definition with that user name. If the authorization file does not contain a definition for that user name, ACMS checks for a $ALL definition to see if all OpenVMS user names are authorized for ACMS access. If there is no $ALL definition, ACMS denies access to the user.

3.2. How to Run UDU

Before using UDU to authorize ACMS users, you must authorize users to log in to the OpenVMS operating system. ACMS users must first be authorized OpenVMS users because their OpenVMS user names and passwords are verified against the OpenVMS SYSUAF.DAT file. See the OpenVMS documentation on the Authorize Utility for information about authorizing OpenVMS users.

When you run UDU to authorize users, UDU creates the user authorization file in your current default directory. By default, at run time ACMS looks in SYS$SYSTEM to find the user authorization file. If you choose to place the authorization file in a directory other than SYS$SYSTEM, you must direct the ACMS system to that location by defining an EXEC mode system logical name, called ACMSUDF, to point to that directory.

For example:

```
$ DEFINE/SYSTEM/EXEC ACMSUDF DEVDISK:ACMSUDF.DAT
```

Run UDU by entering either of the following commands:

```
$ RUN SYS$SYSTEM:ACMSUDU
UDU>
```

or

```
$ MCR ACMSUDU
UDU>
```

When you see the UDU prompt (UDU>), you can begin entering UDU commands. If you enter a UDU command and want to include several qualifiers, you can include all the qualifiers on one line, for example:

```
 ADD user-name /MDB=ACMS.MDB /MENU=EMPLOYEE /AGENT
```

The same command can be entered on several lines if you use the hyphen (–) to indicate a continuation line. For example:

```
UDU> ADD user-name -
_UDU> /MDB=ACMS.MDB /MENU=EMPLOYEE /AGENT
```

You can recall each UDU command you enter by pressing **Ctrl/B**. UDU also supplies a keypad of UDU commands. Press **PF1** and **PF2** to see the keypad display. Type **EXIT** or press **Ctrl/Z** to exit from UDU.

Chapter 18, "UDU Commands" contains information about each UDU command and its qualifiers. You can also get information by using the UDU **HELP** command followed by the command name:

```
UDU> HELP ADD
```

General information about UDU is available at the DCL prompt by typing:

```
$ HELP @ACMSUDU
```

3.3. Running UDU the First Time

ACMS creates a default definition the first time you run UDU, or when you create a new user authorization file. At run time, ACMS assigns the top-level menu and selection prompt, the menu database file specification ACMS$DIRECTORY:ACMS.MDB, and a blank menu path name to the DEFAULT definition.

When you use the **ADD** command to create a new UDU definition, the new definition takes the default information defined in the DEFAULT definition. You can use qualifiers with the **ADD** command to override information from the DEFAULT definition.

Before authorizing multiple new users, it might be convenient to change the initial values in the DEFAULT definition. For example, if you plan to authorize 10 users, all of whom use the menu database PERS_MENU.MDB, you can change the name of the menu database using the UDU **DEFAULT** or **MODIFY** command. For example:

```
UDU> DEFAULT /MDB=PERS_MENU
UDU> ADD $ALL
```

When you authorize the 10 users with the **ADD** command, you do not need to use the **/MDB** qualifier because the **ADD** command uses the default value from the UDU DEFAULT definition.

When you specify a menu database with the **/MDB** qualifier, ACMS assumes the default menu database is in the directory that the logical ACMS$DIRECTORY points to. However, if the database is in another location, you must include in the **DEFAULT** command the device and directory name where the file is stored. For example:

```
UDU> MODIFY DEFAULT /MDB=DISKNAME:[GORDON]ACMS.MDB
```

If you do not specify a file type, UDU assumes the .MDB file type by default.

3.4. Authorizing New Users

The following sections show several different approaches to take when authorizing users. For example, if you have few users to authorize, you may want to write individual authorizations for each user. If you have many users to authorize, you may want to take advantage of the DEFAULT authorization and the $ALL user name.

The next six sections describe the UDU commands you use to authorize new ACMS users and give examples of how to use these commands.

3.4.1. Authorizing Users with ADD, COPY, DEFAULT, and $ALL

Use the **ADD** or **COPY** commands to create definitions that authorize ACMS users. Using the **ADD** command, you create a new definition by either allowing the user information to come from the UDU DEFAULT definition, or typing in the necessary qualifier information yourself. This example adds the user name RICHARDS to ACMSUDU.DAT, taking all information from the UDU DEFAULT definition except the menu database file:

```
UDU> ADD RICHARDS /MDB=DISK02:[USERMENUS]ADDTASKS
```

When a definition already exists with characteristics similar to one you want to create, you can use the **COPY** command to create a new definition based on information from the existing UDU definition. This example copies information from the RICHARDS user definition to create the new GORDON definition:

```
UDU> COPY RICHARDS GORDON
```

You can quickly create authorizations for all OpenVMS users by specifying $ALL as the user name with the **ADD** or **COPY** command. A $ALL definition authorizes all users at once, assigning them the same sign-in display, default menu, and menu database file.

If the user authorization file does not contain a $ALL definition, each ACMS user must have a separate user definition. With separate user definitions, you can restrict some OpenVMS users from signing in to ACMS.

Depending on how many users you are authorizing and the characteristics you want to assign them, you might want to use a $ALL definition to provide generic definitions for all users. Then, you can create separate definitions for those users who need characteristics that most other users do not, such as the agent qualifier.

You must create at least two user definitions: one to authorize the ACMS user (or a $ALL definition to authorize all OpenVMS users), and one to authorize the user name of the ACMS Command Process (see *Section 3.4.6, "Authorizing User Names as Agents"* for information on authorizing the Command Process).

3.4.2. Defining User Initial and Final Tasks

As system manager, you can specify that a user runs a specific task when signing in to ACMS and that the user runs a specific task when signing out of ACMS. For example, you can specify that whenever a user signs in, a task asks for the user's name and telephone number. Or, if a user only runs one particular task all the time, you can specify that that task runs whenever the user signs in without having to select that task from a menu. When the user signs out, you can specify that an accounting task runs to log the

user's work for the day – sign in and sign out time, number of files created, amount of disk space used, and so forth.

To specify an initial or final task for a user, use the **/INITIAL** or **/FINAL** qualifier with the UDU **ADD**, **COPY**, **MODIFY**, **DEFAULT**, or **RENAME** commands. The **/INITIAL** qualifier specifies the name of a task the user runs when signing in. The **/FINAL** qualifier specifies the name of a task the user runs when signing out.

The following command specifies that a user runs the task BOOKING_INFO in the application RESERVATIONS whenever signing in to ACMS:

```
UDU> ADD FORRESTER/INITIAL=(APPLICATION=RESERVATIONS,TASK -
_UDU> =BOOKING_INFO)
```

This command specifies that a user runs the task ACCOUNTING in the application CLERK_REC whenever signing out of ACMS:

```
UDU> ADD KNUTH/FINAL=(APPLICATION=CLERK_REC,TASK=ACCOUNTING)
```

You can use keywords to the **/INITIAL** and **/FINAL** qualifiers to specify how errors are handled if an error occurs in an initial or final task. By default, if the specified initial task fails, UDU displays an error message describing the reason for the failure, records the task's status in the Audit Trail Log, and signs the user out of ACMS. The final task (if one is specified) does not execute. You can specify that ACMS ignore errors in an initial task by specifying the IGNORE_ERROR keyword with the **/INITIAL** qualifier. When an error occurs in the initial task, the user remains signed in. For example:

```
UDU> ADD EINSTEIN/INITIAL=(APPLICATION=RESOURCES,TASK=ACCT, -
_UDU> IGNORE_ERROR)
```

If an error occurs in a final task, ACMS displays the error message "Final task failed" and records the reason for the error in the Audit Trail Log. You can use the IGNORE_ERROR keyword with the **/FINAL** qualifier to specify that ACMS ignore an error in the final task. For example:

```
UDU> ADD PLATO/FINAL=(APPLICATION=REC_APPL,TASK=UPDATE,IGNORE_ERROR)
```

When you use the IGNORE_ERROR keyword for a final task, ACMS does not issue an error message or record the error in the Audit Trail Log when an error occurs.

Specify a parameter (such as a file name) with an initial or final task, by using the SELECTION_STRING keyword. The following command specifies that a user run the final task SHOW_TRANSACTIONS whenever signing out of ACMS. SHOW_TRANSACTIONS displays a file containing a record of the day's events. TRANSACTION_OUTPUT.DAT is the log file displayed:

```
UDU> ADD TOLSTOY/FINAL=(APPLICATION=ACCOUNTING,TASK= -
_UDU> SHOW_TRANSACTIONS, SELECTION_STRING="TRANSACTION_OUTPUT.DAT")
```

You can display the initial and final tasks defined for a user by using the **SHOW** command. For example:

```
UDU> SHOW TOLSTOY

User Name:          TOLSTOY           DISPLAY MENU
Default Menu:
Default MDB:        INVENTORY
Initial Task:                          IGNORE ERROR
  Application:      RESOURCE
  Task:             ACCT
  Selection:
Final Task:                            IGNORE ERROR
  Application:      ACCOUNTING
```

```
  Task:           SHOW_TRANSACTIONS
  Selection:      TRANSACTION_OUTPUT.DAT
Language:
Printfile:
```

ACMS has a special menu called ACMS$EXIT to use when no menu processing should be performed for a user. For example, if users have an initial task established that performs menu control for those users, you can assign the ACMS$EXIT menu to those users to perform an exit from ACMS whenever they exit from the initial task. For example:

```
UDU> MODIFY LAO/MDB=ACMS /MENU=ACMS$EXIT/INITIAL= -
_UDU> (APPLICATION=RESERVATIONS,TASK=RESERVE_MENU)
```

This example defines an initial task for user LAO that serves as a menu control task. When this task exits, user LAO does not have a menu displayed at the terminal. Instead, the user is signed out of the ACMS system.

The TDMS request for the ACMS$EXIT menu returns "Exit" as if it were typed by the user at the selection prompt, but does this without terminal interaction.

3.4.3. Defining the Initial Menu Display

Menu displays help users to select tasks. Upon signing in, each ACMS user sees either a menu and a selection prompt, or just a selection prompt. For users who need a menu and a selection prompt, specify a default menu in the user definition by assigning each user a menu database file with the **/MDB** qualifier, and a menu path name with the **/MENU** qualifier. If you do not include this information in the UDU definition, the ACMS default is to assign the user the top-level menu in the menu tree. This feature provides security to the system, because it enables you to restrict certain menus to selected users.

Menus offer a limited amount of task protection, since a menu can restrict the tasks that a user can select (if the **SELECT** command is disabled). However, other measures are required for adequate task protection. For more information on task protection, refer to *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/].

For users who need only the selection prompt, specify that no menu be displayed by using the **/NODISPLAY_MENU** qualifier in the user definition. For example, you might want to suppress the menu display for more experienced users. Or, if the default menu is the highest menu in the menu tree, you might want to reduce the need to page through several levels of menus by having the initial menu display be lower in the menu tree.

The following example shows how the **/NODISPLAY_MENU** qualifier suppresses the menu display for the user name WINSTON:

```
UDU> SHOW WINSTON
User name:          WINSTON       DISPLAY MENU
Default menu:
Default MDB:        EMPLOYEE
Initial Task:
  Application:
  Task:
  Selection:
Final Task:                       IGNORE ERROR
  Application:      PAYROLL
  Task:             SHOW_CHANGES
  Selection:        PAYROLL.DAT
Language:
Printfile:
```

```
UDU> MODIFY WINSTON /NODISPLAY_MENU
UDU> SHOW WINSTON
User name:        WINSTON
Default menu:
Default MDB:      EMPLOYEE
Initial Task:
  Application:
  Task:
  Selection:
Final Task:                    IGNORE ERROR
  Application:    PAYROLL
  Task:           SHOW_CHANGES
  Selection:      PAYROLL.DAT
Language:
Printfile:
```

The sign-in display you define with UDU is only the initial display characteristic. Users can modify their sign-in displays at run time by selecting the **MENU** and **NOMENU** commands in the ACMS command menu.

3.4.4. Specifying a Language for a User

With DECforms, you can create a number of different layouts for a form. One way to use the multiple-layout feature is to specify a natural language for each layout in a form. For example, within the same form, use one layout for panels in French, another layout for panels in Spanish, and a third layout for panels in English.

Note

If you define several layouts in a form, you **must** specify a language for each layout if you want to display any layout other than the first one.

To specify a language for an existing form, first select the "Modify Layout" option on the DECforms FDE Main Menu. DECforms then displays the Modify Layout Screen, where the "Language" prompt appears. To assign a language to a layout, enter the name of the language, for example:

```
Layout Name: FRENCH_PANEL
.
.
.
Language: FRENCH
```

You can use the language specification for purposes other than to associate a natural language with a layout. You can, for example, use the layout language specification to distinguish panels designed for novice, experienced, and expert users.

To select a layout for each user of DECforms forms, you assign a language to a user by adding a language specification to the UDU utility database. You do this by using the **MODIFY** command with the **/LANGUAGE** qualifier. To select panels in French for the user LeBlanc, for example, you enter the following:

```
UDU> MODIFY LEBLANC/LANGUAGE=FRENCH
```

When you specify a language for a user in UDU, the language is used to select the appropriate layout among DECforms forms and to display the correct panels to the user. The name of the language also appears when you use the **SHOW** command to display a user's record, for example:

```
UDU> SHOW LEBLANC
User name:          LEBLANC           DISPLAY MENU
.
.
.
Language:    FRENCH
```

You can specify a language for DECforms forms that is used both in ACMS tasks and in ACMS menus. The DECforms menu form supplied by ACMS contains a standard layout without any language name. You need to specify a language in a menu form to display the menu to users who enter through the Command Process (CP) and who have a corresponding language specified in the ACMSUDU.DAT file.

By specifying a language for a menu form layout, you can update the prompt and the instruction line of the menu to use the appropriate language. To translate the header and the entries of the menu, however, you must use a different menu definition (.MDF) for each language.

You can display the same menu to all users, whether they have a language specified for them or not. In this case, use only one language for the prompt and instruction line; this saves the step of adding a layout for each language in the menu form. An additional benefit is to keep the size of the menu form to a minimum.

To specify a language for a user for all forms except menu forms, you use the **/SKIPMENULANGUAGE** qualifier. To select NOVICE forms to be displayed to Smith for tasks but not for menus, you enter the following:

```
UDU> MODIFY SMITH/LANGUAGE=NOVICE/SKIPMENULANGUAGE
```

After you add the **/SKIPMENULANGUAGE** qualifier, it appears on the user's record when you issue the **SHOW** command:

```
UDU> SHOW LEBLANC

User name:          LEBLANC           DISPLAY MENU
.
.
.
Language:    FRENCH        SKIPMENULANGUAGE
```

3.4.5. Specifying a Printfile for a User

Besides using the **/PRINTFILE** qualifier to specify a printfile name or a spooled device name for a terminal device (which is explained in *Chapter 2, "Authorizing and Controlling Terminals"*), you can also use this qualifier to specify a printfile name or spooled device name for a user.

When a form is enabled, ACMS uses the Printfile characteristic for the terminal device, if it is available. If the characteristic is not found, ACMS uses the Printfile characteristic for the user. If neither has been specified, but a PRINT response and a print key are defined in the form source IFDL file, a file with the name <form-name>.TXT is placed in the SYS$MANAGER directory (if the CP is the agent), or in the default directory of the agent.

To use the **/PRINTFILE** qualifier for a user, follow these steps:

1. Use a DECforms PRINT response step in a form source IFDL file wherever a response step can be used; for example, you can place it in a field exit response or in a panel exit response. Also define a print key that users press when they want to print a panel. See *VSI DECforms Programmer's Reference Manual* [https://docs.vmssoftware.com/vsi-decforms-for-openvms-programmer-s-reference-manual/] for details about response steps and defining DECforms keys.

2. To specify a printfile for a user in ACMS, use UDU to enter your printfile specification:

```
 UDU> MODIFY <username>/PRINTFILE=<print-file-spec>/<spooled-device-
name>
```

   When you enter a printfile specification, ACMS uses this name for the DECforms panel screen. When you enter a spooled device name, ACMS sends any panel screen for this user to the spooled device that you specify.

After you modify a user's record with the **/PRINTFILE** qualifier, the new specification appears when you display user information using the **SHOW** command, for example:

```
 UDU> MODIFY WINSTON /PRINTFILE=SPOOLDEV::TXA0:
UDU> SHOW WINSTON
User name:        WINSTON
Default menu:
Default MDB:      EMPLOYEE
Initial Task:
  Application:
  Task:
  Selection:
Final Task:                    IGNORE ERROR
  Application:    PAYROLL
  Task:           SHOW_CHANGES
  Selection:      PAYROLL.DAT
Language:
Printfile:  SPOOLDEV::TXA0:
```

When a form is enabled, ACMS uses the printfile specification for a device assigned by the Device Definition Utility (DDU), if it is available. If it is not, ACMS uses the printfile specification for the user, as specified in UDU.

3.4.6. Authorizing User Names as Agents

Normally, ACMS users can submit tasks only under their own user names. An agent is an OpenVMS process that submits ACMS tasks for processing on behalf of ACMS users whose user names are different from the agent's user name. For security reasons, you must authorize agents by adding the user name of the agent process and including the **/AGENT** qualifier.

The CP and the Queued Task Initiator (QTI) are agents supplied by ACMS. ACMS requires that you create separate user definitions using the **/AGENT** qualifier to authorize the CP and the QTI as agents. If your system does not have any agents created with the ACMS Systems Interface (SI), you need only authorize the user name of the CP and QTI as agents.

Although ACMS assigns the user name SYSTEM to the Command Process when you install ACMS, it does not automatically authorize the SYSTEM user name. You must authorize the user name of the Command Process as an agent before it can handle sign-ins, task submission, and interaction between ACMS and ACMS users. If you wish to change the user name of the Command Process to something other than SYSTEM, you can do so using the ACMSGEN Utility. To authorize the Command Process with the SYSTEM user name, use these UDU commands:

```
UDU> ADD SYSTEM/AGENT
User SYSTEM         has been added to the data base
UDU> SHOW SYSTEM
User name:       SYSTEM     DISPLAY MENU      AGENT
Default menu:
Default MDB:
```

```
Initial Task:
  Application:
  Task:
  Selection:
Final Task:
  Application:
  Task:
  Selection:
Language:
Printfile:
```

If your system has agents that were created using the ACMS Systems Interface (SI), you must authorize the user names of these OpenVMS processes using the **/AGENT** qualifier. For example, to authorize an SI agent with the user name SI_AGENT, use these commands:

```
UDU> ADD SI_AGENT/AGENT -
_UDU> /MDB=DISK$:[TOPLEVEL]ACMS.MDB -
_UDU> /MENU=PERSONNEL
User SI_AGENT has been added to the data base
UDU> SHOW SI_AGENT
User name:        SI_AGENT          AGENT
Default menu:     PERSONNEL
Default MDB:      DISK$:[TOPLEVEL]ACMS.MDB
Initial Task:
  Application:
  Task:
  Selection:
Final Task:
  Application:
  Task:
  Selection:
Language:
Printfile:
```

As the example shows, when authorizing a user name with the **/AGENT** qualifier, you must explicitly assign the display characteristic and a menu database file to that user name. You can also assign a default menu path name. With its user name defined in the user authorization file, SI_AGENT can submit tasks to ACMS under any user name. See *VSI ACMS for OpenVMS Systems Interface Programming* [https://docs.vmssoftware.com/vsi-acms-sys-interface-prog/] for more information on the SI.

3.5. Working with Existing UDU Definitions

From time to time you have to update UDU definitions. During a UDU session you may need to display, list, delete, or rename the user definitions in the user authorization file. This section shows you how to manipulate existing UDU definitions.

3.5.1. Looking at UDU Definitions with SHOW and LIST

When you add or change user information, you can verify information in the authorization file with either the **SHOW** or the **LIST** command.

UDU provides a **SHOW** command to display information on your terminal and a **LIST** command to copy UDU definitions to an output file. Use the **SHOW** and the **LIST** commands to verify the names and default menus after you have added several users. For example:

```
UDU> SHOW *
```

```
User name:      $ALL             DISPLAY MENU
Default Menu:
Default MDB:    INVENTORY
Initial Task:                    IGNORE ERROR
  Application:  VALIDATE_APPL
  Task:         ACCESS_RIGHTS
  Selection:
Final Task:
  Application:
  Task:
  Selection:
Language:
Printfile:
User name:      CRAWFORD         DISPLAY MENU
Default Menu:
Default MDB:    ACCOUNTING
Initial Task:
  Application:
  Task:
  Selection:
Final Task:                       IGNORE ERROR
  Application:  PAYROLL
  Task:         SHOW_CHANGES
  Selection:    PAYROLL.DAT
Language:
Printfile:
```

When you specify the wildcard character (*), UDU displays all definitions in the user authorization file. To see a particular user definition, specify the user name with the **SHOW** command.

To copy information from the user authorization file to the ACMSUDU.LIS file, type the **LIST** command with the user name or wildcard character (*) at the UDU prompt:

```
UDU> LIST GORDON
```

This command copies the GORDON definition to the ACMSUDU.LIS file in your default directory.

3.5.2. Deleting UDU Definitions

If a user is no longer a valid ACMS user, remove the user definition from the user authorization file with the **REMOVE** command. The **REMOVE** command deletes the user definition from ACMSUDF.DAT and displays a message confirming the action. For the user name parameter, you can use an OpenVMS user name or $ALL.

3.5.3. Renaming UDU Definitions

Use the **RENAME** command when you want to change a user name. Because the **RENAME** command uses the same qualifiers as the **ADD**, **COPY**, **DEFAULT**, and **MODIFY** commands, you can change any of the original characteristics while you change the user name.

3.6. Summary of UDU Commands and Qualifiers

UDU commands allow you to create, change, and remove user definitions, and change user names. *Table 3.1, "Summary of UDU Commands"* lists the UDU commands and qualifiers and provides a brief

description of each command. For a complete description of the UDU commands and qualifiers, see *Chapter 18, "UDU Commands"*.

Table 3.1. Summary of UDU Commands

Commands and Qualifiers	Description
ADD /[NO]AGENT /[NO]DISPLAY_MENU /[NO]FINAL /[NO]INITIAL /LANGUAGE[=*language-name*] /MDB=*menu-database-file* /MENU[=*menu-path-name*] /PRINTFILE[=*print-file-spec/spooled-device-name*] /[NO]SKIPMENULANGUAGE	Adds a new user record to the user authorization file. Unless qualifiers are included, the user information comes from the DEFAULT definition.
ADD /PROXY	Adds a user proxy to the ACMS proxy file (ACMSPROXY.DAT). Before you can use the **ADD /PROXY** command, you must have already created a proxy file with the **CREATE /PROXY** command.
COPY /[NO]AGENT /[NO]DISPLAY_MENU /[NO]FINAL /[NO]INITIAL /LANGUAGE[=*language-name*] /MDB=*menu-database-file* /MENU[=*menu-path-name*] /PRINTFILE[=*print-file-spec/spooled-device-name*] /[NO]SKIPMENULANGUAGE	Authorizes and assigns sign-in characteristics to new users by copying information from an existing UDU definition.
CREATE /PROXY	Creates an empty ACMS proxy file (ACMSPROXY.DAT).
DEFAULT /[NO]AGENT /[NO]DISPLAY_MENU /[NO]FINAL /[NO]INITIAL /LANGUAGE[=*language-name*] /MDB=*menu-database-file* /MENU[=*menu-path-name*] /PRINTFILE[=*print-file-spec/spooled-device-name*] /[NO]SKIPMENULANGUAGE	Changes information in the DEFAULT definition. If you omit one or more qualifiers from the **ADD** command, the new definition takes information from the existing DEFAULT definition.
EXIT	Ends the UDU session and returns you to the DCL prompt.
HELP /[NO]PROMPT	Provides online information about UDU commands.

Commands and Qualifiers	Description
LIST /BRIEF /output=[*file-spec*]	Writes UDU definitions to ACMSUDU.LIS in your default directory or to an output file you specify.
LIST /PROXY /OUTPUT=*file-spec*	Writes all the proxies in the ACMS proxy file to the output file ACMSPROXY.LIS. You can use the **/OUTPUT** qualifier to specify a different output file name.
MODIFY /[NO]AGENT /[NO]DISPLAY_MENU /[NO]FINAL /[NO]INITIAL /LANGUAGE[=*language-name*] /MDB=*menu-database-file* /MENU[=*menu-path-name*] /PRINTFILE[=*print-file-spec/spooled-device-name*] /[NO]SKIPMENULANGUAGE	Changes information in UDU definitions.
REMOVE	Removes UDU definitions from the user authorization file, ACMSUDF.DAT.
REMOVE /PROXY	Removes the specified proxy from the ACMS proxy file (ACMSPROXY.DAT).
RENAME /[NO]AGENT /[NO]DISPLAY_MENU /[NO]FINAL /[NO]INITIAL /LANGUAGE[=*language-name*] /MDB=*menu-database-file* /MENU[=*menu-path-name*] /PRINTFILE[=*print-file-spec/spooled-device-name*] /[NO]SKIPMENULANGUAGE	Changes the user name and, with qualifiers, other information in UDU definitions.
SHOW /BRIEF	Displays UDU definitions at your terminal.
SHOW /PROXY	Displays one or more proxies in the ACMS proxy file (ACMSPROXY.DAT).

Chapter 4. Authorizing Applications

This chapter describes the use of the ACMS Application Authorization Utility (AAU) to authorize ACMS applications. See *Section 4.6, "Summary of AAU Commands and Qualifiers"* for a summary of AAU commands and qualifiers. For reference information on the commands described in this chapter, refer to *Chapter 19, "AAU Commands"*.

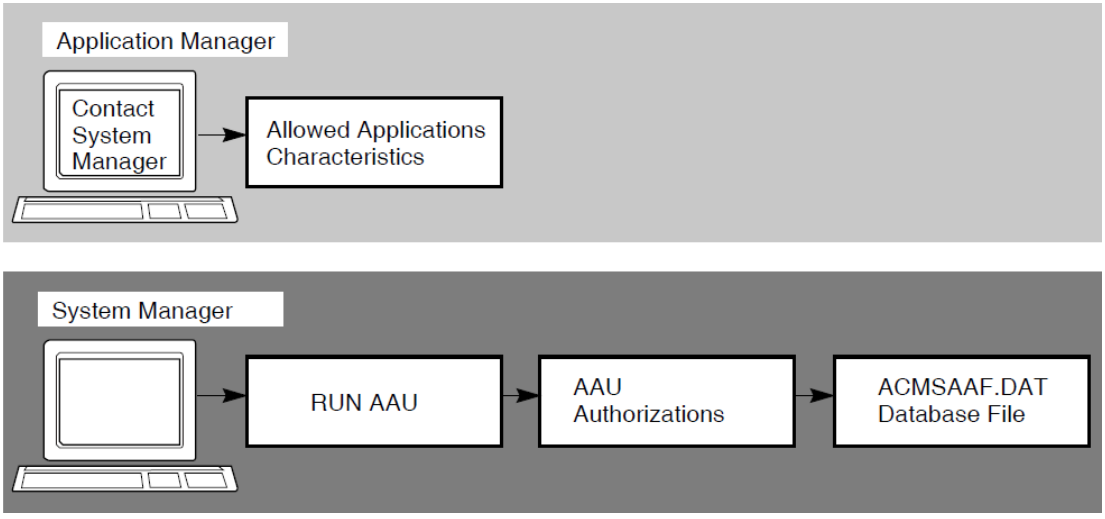
4.1. How AAU Works

System managers use the Application Authorization Utility (AAU) to create an application authorization file (ACMSAAF.DAT) that contains records, called **authorizations**, of an application's information. Authorizing applications lets a system manager define the characteristics of an application, such as:

- Name of the application
- UIC and/or identifier of each user authorized to install the application in ACMS$DIRECTORY
- User name of the application
- User names of the server processes used by the application
- Specification for whether the application can run with dynamic user names or the user names of terminal users

Figure 4.1, "AAU Application Authorization Process" shows the authorization portion of the AAU process.

Figure 4.1. AAU Application Authorization Process



Before users can start an ACMS application, the application database file for that application must be stored in the directory pointed to by the logical name ACMS$DIRECTORY. For security reasons, this directory is set up as a protected directory to prevent an unauthorized user from storing applications containing tasks that run under privileged user names.

With the AAU commands and qualifiers, a system manager can authorize applications and grant application installation rights to users who otherwise do not have access to ACMS$DIRECTORY. Users

who are authorized to install .ADB files can then install the application in ACMS$DIRECTORY by using the **ACMS/INSTALL** operator command.

Using AAU is optional for users who already have access to ACMS$DIRECTORY. These users can store .ADB files in ACMS$DIRECTORY without authorization in the AAU. For example, these users could use the DCL **COPY** command to copy an .ADB file into ACMS$DIRECTORY.

By authorizing users to install applications, you gain the following benefits:

- Assigning installation of applications to the users most involved with those applications leaves system managers free for other tasks.
- By systematically checking applications, the AAU provides extra security and frees system managers from manually checking applications.
- Users can install applications at their convenience without having privileged access to the ACMS$DIRECTORY directory. The system manager can also limit the applications a user is allowed to install.

Users named in the AAU database can use the **ACMS/INSTALL** operator command to install any application for which they have installation authorization. When a user issues this command, ACMS checks the AAU authorization file (ACMSAAF.DAT) to see if the application has an authorization in the file and if the user running the **ACMS/INSTALL** command is authorized to install the application. If either the application or the user trying to install it is not authorized in the AAU authorization file, ACMS prevents the installation of the application.

4.2. How to Run AAU

Use either of the following commands to run AAU:

```
$ RUN SYS$SYSTEM:ACMSAAU
AAU>
```

or

```
$ MCR ACMSAAU
AAU>
```

When you run AAU, ACMS displays the AAU prompt (AAU <!close>). Then enter any AAU command (including the AAU command **HELP** to get online help information) or press the **PF1** and **PF2** keys for access to a keypad of AAU commands. Press **Ctrl/B** to recall each AAU command you enter. To exit from AAU, use the AAU command **EXIT** or press **Ctrl/Z**.

When you run AAU, ACMS searches for the ACMSAAF.DAT in SYS$SYSTEM. If ACMSAAF.DAT does not exist, you are asked if you want to create a new authorization file. You can store ACMSAAF.DAT in a directory other than SYS$SYSTEM by defining the executive mode system logical name ACMSAAF:

```
$ DEFINE/SYSTEM/EXEC ACMSAAF DEVDISK:ACMSAAF.DAT
```

ACMS creates a DEFAULT authorization the first time you run AAU, or any time you run AAU from a directory that has no ACMSAAF.DAT. The DEFAULT authorization is created with an empty access control list; by default, no users are authorized to install applications in ACMS$DIRECTORY. *Table 4.1, "Initial Settings for the DEFAULT Authorization"* contains a list of the initial values that AAU assigns to the DEFAULT authorization when it is created.

Table 4.1. Initial Settings for the DEFAULT Authorization

Qualifier	Default Setting
/ACL	(IDENTIFICATION=*, ACCESS=NONE) *The default ACL denies installation rights.*
/APPL_USERNAME	/APPL_USERNAME=*
/[NO]WILD_SUFFIX	/NOWILD_SUFFIX
/[NO]DYN_USERNAMES	/NODYN_USERNAMES
/SRV_USERNAMES	/SRV_USERNAMES=*

In *Table 4.1, "Initial Settings for the DEFAULT Authorization"*, the wildcard character (*) indicates that any user name or ID in the application is acceptable. To ensure that an application is running with the right user names, override the wildcard defaults by assigning user names in application authorizations.

4.3. Before Authorizing Applications

Before starting to authorize applications, you may want to change the initial default values in the DEFAULT authorization. Do this with either the **DEFAULT** or the **MODIFY** command. The new values should reflect the characteristics that you intend to assign to the majority of applications you plan to authorize.

For example, suppose you have to authorize five applications and plan to give the same users the right to install all the applications. Assign a default value to those users in the DEFAULT authorization. When you authorize the five applications with the **ADD** command, you do not need to use the **/ACL** qualifier. The **ADD** command uses the default **/ACL** value from the DEFAULT authorization.

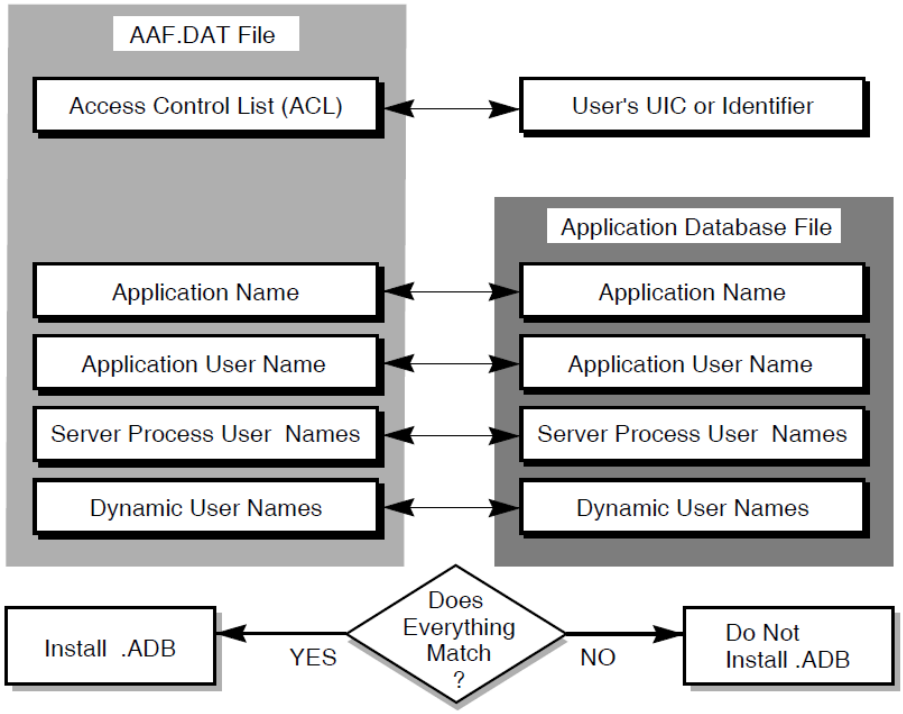
Because of privileges and quotas that are associated with certain user names, you must be careful about:

- User name under which an application runs
- User names of server processes for an application
- Whether or not server processes in an application should run with dynamic user names

For example, suppose an application manager decides that several applications should run only with particular user names and server process user names, and that these applications should run without server processes having dynamic user names. The application manager can use AAU to create applications in such a way that the application is not installed unless these settings match the ones found in the .ADB file.

Figure 4.2, "Conditions for Installing an Application" shows the information that must match before an application can be installed.

Figure 4.2. Conditions for Installing an Application



Even if the application information is changed, the application cannot be installed unless it has the same values the application manager originally assigned in the application authorization. This extra layer of security ensures that each application running on an ACMS system has passed a series of tests that protect applications from unauthorized use.

4.4. Authorizing New Applications

The following sections show several different approaches to take when authorizing applications. For example, if you have few applications to authorize, you may want to write individual authorizations for each application. If you have many applications to authorize, you may want to take advantage of the DEFAULT authorization using the $ALL application name.

4.4.1. Authorizing All Applications with $ALL

The quickest and simplest way to authorize applications is to create a $ALL authorization. Use $ALL as the application name when you enter the **ADD** command in response to the AAU prompt. For example:

```
AAU> ADD $ALL /ACL=(IDENTIFIER=[GORDON],ACCESS=CONTROL)
```

If you have not altered the DEFAULT authorization, the $ALL authorization takes the default values that ACMS originally sets for all the qualifiers you do not include with the **ADD** command. The preceding **ADD** command, therefore, creates a $ALL authorization allowing user GORDON to install any application on the system.

4.4.2. Authorizing Individual Applications

If you choose to create individual authorizations for each application, name the application with the **ADD** command and assign any necessary qualifiers. For example:

```
AAU> ADD INVENTORY /ACL=(ID=[GORDON],ACCESS=CONTROL) -
```

```
_AAU> /APPL_USERNAME=INVTRY -
_AAU> /SRV_USERNAMES=(PARTS,STOCK) -
_AAU> /DYNAMIC_USERNAMES -
_AAU> /NOWILD_SUFFIX
```

This command authorizes user GORDON to install the application INVENTORY if the application database file (.ADB) has the application user name INVTRY and two server processes with user names PARTS and STOCK. The **/DYNAMIC_USERNAMES** qualifier lets user GORDON install the INVENTORY application with the dynamic user name characteristic. Because all qualifiers are included, the **ADD** command does not use any default values from the DEFAULT authorization.

When there is an authorization in the AAU authorization file with characteristics similar to one you want to create, you can save time by using the **COPY** command. For example:

```
AAU> COPY INVENTORY ACCOUNTING /ACL=(ID=[SMITH],ACC=CON)-
_AAU> /SRV_USERNAMES=(ADD,SUB)
```

Here, the **COPY** command creates an exact copy of the INVENTORY application authorization and names it ACCOUNTING. The qualifiers with the **COPY** command change the authorized user to SMITH and the two server user names to ADD and SUB.

4.4.3. Authorizing Applications with /[NO]WILD_SUFFIX

The **/[NO]WILD_SUFFIX** qualifier allows a user to install or prevents a user from installing any application whose name begins with the letters of the application name you are installing.

If your ACMS system has many applications that begin with the same characters, the **/WILD_SUFFIX** qualifier can save you time and give you additional flexibility when you are creating authorizations. For example:

```
AAU> ADD TEST /WILD_SUFFIX /APPL_USERNAME=TEST_EXE -
_AAU> /ACL=(ID=[SMITH],ACCESS=CONTROL) -
_AAU> /SRV_USERNAMES=(TEST1,TEST2) -
_AAU> /NODYN_USERNAMES
```

This command lets the authorized user SMITH install any application that starts with the letters TEST. SMITH can install applications such as TEST, TESTA, TESTB, TESTC, TEST1.

4.5. Working with Existing AAU Authorizations

During an AAU session you may need to display, list, delete, or rename the application authorizations in the AAU authorization file. The following sections describe these functions.

4.5.1. Looking at AAU Authorizations with SHOW and LIST

There are many occasions when a quick check of authorizations in the AAU authorization file is helpful. For example, you may need to check the DEFAULT authorization if you cannot remember its current settings. To display application authorizations on your terminal screen, use the **SHOW** command. The output from the **SHOW** command is shown in *Example 4.1, "AAU SHOW Command"*.

When you use the wildcard character (*), AAU displays all authorizations in the AAU authorization file. To see a particular application authorization, include the application name with the **SHOW** command.

To obtain a hardcopy listing of information in the authorization file, use the **LIST** command with the application name at the AAU> prompt. For example:

```
AAU> LIST CREDITOR
```

This command copies the contents of the CREDITOR application authorization to the ACMSAAU.LIS file in your default directory.

Example 4.1. AAU SHOW Command

```
AAU> SHOW *

================================================================
Appl Name:  $ALL
Appl Username:  *
Server Usernames:
   *
Access Control List:
    (IDENTIFIER=[*,*],ACCESS=CONTROL)
================================================================
Appl Name:  CREDITOR
Appl Username:  CREDIT
Server Usernames:
    CREDIT1
    CREDIT2

Access Control List:
    (IDENTIFIER=[PAYUP,*],ACCESS=CONTROL)
================================================================
Appl Name:  DEFAULT                                    WILD SUFFIX
Appl Username:  DEBT
Server Usernames:
    DEBT1
    DEBT2

Access Control List:
    (IDENTIFIER=[PERSONNEL,*],ACCESS=CONTROL)
================================================================
AAU>
```

4.5.2. Deleting Authorizations from ACMSAAF.DAT

If an application is no longer being used, you need to remove its authorization from the AAU authorization file. When you identify unused applications, you can delete them with the **REMOVE** command. The **REMOVE** command deletes the application authorization from the authorization file and prints a message confirming the action. The application name can be that of an application, or it can be $ALL.

4.5.3. Renaming AAU Authorizations

You can use the **RENAME** command when you want to change the name of an authorization. Because the **RENAME** command uses the same qualifiers as the **ADD**, **COPY**, **DEFAULT**, and **MODIFY** commands, you can change any of the original authorization's characteristics while you change the authorization's name.

4.6. Summary of AAU Commands and Qualifiers

AAU commands allow you to create, change, and remove device definitions stored in the AAU authorization file. *Table 4.2, "Summary of AAU Commands"* lists the AAU commands and qualifiers and provides a brief description of each command. See *Chapter 19, "AAU Commands"* for a complete description of each AAU command and qualifier.

Table 4.2. Summary of AAU Commands

Commands and Qualifiers	Description
ADD /ACL=(*ace*[,...]) /APPL_USERNAME=*appl-username* /[NO]DYNAMIC_USERNAMES /[NO]WILD_SUFFIX /SRV_USERNAME [=(*srv-username*[,...])]	Creates authorizations so that AAU authorized users can install application database files in ACMS$DIRECTORY. If you omit the qualifiers, the new definition takes qualifier information from the DEFAULT definition.
COPY /ACL=(*ace*[,...]) /APPL_USERNAME=*appl-username* /[NO]DYNAMIC_USERNAMES /[NO]WILD_SUFFIX /SRV_USERNAME [=(*srv-username*[,...])]	Creates a new authorization by copying information from an existing authorization and, with qualifiers, changes other information.
DEFAULT /ACL=(*ace*[,...]) /APPL_USERNAME=*appl-username* /[NO]DYNAMIC_USERNAMES /[NO]WILD_SUFFIX /SRV_USERNAME [=(*srv-username*[,...])]	Changes information in the DEFAULT authorization. If you omit one or more qualifiers from the **ADD** command, the new authorization takes information from the existing DEFAULT authorization.
EXIT	Ends the AAU session and returns you to the DCL prompt.
HELP /[NO]PROMPT	Displays information about AAU commands, parameters, and qualifiers.
LIST /BRIEF /OUTPUT=[*file-spec*]	Writes AAU definitions to ACMSAAU.LIS in your default directory or to an output file you specify.
MODIFY /ACL=(*ace*[,...]) /APPL_USERNAME=*appl-username* /[NO]DYNAMIC_USERNAMES /[NO]WILD_SUFFIX /SRV_USERNAMES [=(*srv-username*[,...])]	Changes information in AAU authorizations.
REMOVE	Deletes an authorization from the authorization file (ACMSAAF.DAT).
RENAME /ACL=(*ace*[,...]) /APPL_USERNAME=*appl-username*	Changes the name of an application authorization and, with qualifiers, other information in the AAU authorization.

Commands and Qualifiers	Description
/[NO]DYNAMIC_USERNAMES /[NO]WILD_SUFFIX /SRV_USERNAMES [=(*srv-username*[,...])]	
SHOW /BRIEF	Displays application authorizations at your terminal.

Chapter 5. Creating and Managing Queues

This chapter describes how to create and manage ACMS queues and how to manage queued task elements using the ACMSQUEMGR Utility. This chapter assumes a general knowledge of the ACMS Queued Task Facility. Please read the description of the ACMS Queued Task Facility in *VSI ACMS for OpenVMS Concepts and Design Guidelines* [https://docs.vmssoftware.com/vsi-acms-concepts-and-design-guide/] before reading this chapter. See *Section 5.6, "Summary of ACMSQUEMGR Commands and Qualifiers"* for a summary of ACMSQUEMGR commands and qualifiers. For reference information on the commands described in this chapter, refer to *Chapter 20, "ACMSQUEMGR Commands"*.

5.1. How ACMSQUEMGR Works

Use ACMS Queue Manager (ACMSQUEMGR) Utility commands to create and manage task queues and to manage the elements in the task queues. In addition to using the ACMSQUEMGR, system managers and application managers who are responsible for the ACMS Queued Task facility may need to:

- Control the Queued Task Initiator (QTI) to process task queues. The QTI must be started before you can start task queues. See *Chapter 8, "Controlling the ACMS System"* for information on the operator commands you can use to control the QTI and start task queues.
- Set up an OpenVMS user name for the QTI process. See *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"* for information about defining a user name for the QTI.
- Monitor the QTI process by reading the QTI audit reports generated by the Audit Trail Logger. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about monitoring the QTI process.

Use the ACMSQUEMGR commands to perform operations directly on task queues or queued task elements while you use queuing operator commands to control the QTI's processing of task queues.

Note

ACMS task queues are totally independent from OpenVMS task queues.

Use ACMSQUEMGR commands to create and delete task queues and display information about the task queues as well as to modify static and dynamic characteristics of task queues. When you create a task queue, ACMSQUEMGR creates a queue definition file to keep information about each of the queues on a system or cluster. The queue definition file contains the following information about a queue:

- Name of the task queue
- Whether or not tasks can be queued (the enqueue state)
- Whether or not queued task elements in the queue can be read and processed by the QTI (the dequeue state)
- Maximum workspace size for a task executing in the task queue
- File specification of the task queue repository file

You can also use ACMSQUEMGR commands to manage any queued task elements in the task queues. When you queue a task, the ACMS$QUEUE_TASK service creates a record of information for that task called a queued task element. Queued task elements for a queue are stored in a queue repository file. A queued task element contains the following information about a task:

- Task name
- Application name
- Workspace values
- Element priority
- Queue name
- Enqueuer user name
- Enqueue time
- Enqueue state
- Element ID
- Error count

The information in a queued task element is specified by using parameters to the ACMS$QUEUE_TASK service. See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for more information about the ACMS Queued Task Services.

An element ID is assigned to the queued task element when it is created with the ACMS$QUEUE_TASK service. Use the element ID with ACMSQUEMGR commands to set the processing characteristics of a queued task element, delete a queued task element, or display information about queued task elements.

5.2. How to Run ACMSQUEMGR

Use either of the following commands to start the ACMSQUEMGR Utility:

```
$ RUN SYS$SYSTEM:ACMSQUEMGR
ACMSQUEMGR>
```

or

```
$ MCR ACMSQUEMGR
ACMSQUEMGR>
```

When you see the ACMSQUEMGR prompt (ACMSQUEMGR>), you can begin entering ACMSQUEMGR commands, including the **HELP** command, to get online help information.

Instead of typing in individual ACMSQUEMGR commands, you can enter ACMSQUEMGR commands by pressing keypad keys. Press the **PF1** and **PF2** keypad keys for access to the ACMSQUEMGR command keypad. Press **Ctrl/B** to recall each of the last 20 ACMSQUEMGR commands you entered. To exit from the ACMSQUEMGR, press **Ctrl/Z** or use the **EXIT** command.

ACMSQUEMGR also supports DCL foreign commands. From DCL level, define the DCL symbol ACMSQUEMGR as a foreign command in your LOGIN.COM file. For example:

```
$ ACMSQUEMGR:==$SYS$SYSTEM:ACMSQUEMGR
```

Once you define ACMSQUEMGR as a DCL foreign command, you can issue ACMSQUEMGR commands from DCL level. For example:

```
$ ACMSQUEMGR SHOW ELEMENT * PAYROLL_QUEUE
$ ACMSQUEMGR DELETE ELEMENT PAYRLL::2F600041 PAYROLL_QUEUE
$ ACMSQUEMGR SET QUEUE PAYROLL_QUEUE /ENQUEUES=SUSPENDED
```

See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/#SYMBOLS_CH] for more information on foreign commands.

To run the ACMSQUEMGR, you need:

- Read/write access to the ACMS queue definition file (ACMSQDF.DAT)
- Access to the queue file or files with which you are going to work

When you run ACMSQUEMGR for the first time, it searches for an existing queue definition file and, if it does not find one, asks you if you want to create a new file. For example:

```
 %ACMQUEMGR-I-ERROPNFIL, Unable to open the ACMS Queue Definition File
                         SYS$SYSROOT:[SYSEXE]ACMSQDF.DAT
-RMS-F-FNF, file not found
Do you want to create a new file?
```

If you answer YES to this question, the ACMSQUEMGR creates a new queue definition file. Otherwise, the ACMSQUEMGR exits.

By default, the queue definition file is named SYS$SYSTEM:ACMSQDF.DAT, but you can define the logical name ACMSQDF to point to a different file specification or location:

```
$ DEFINE /SYSTEM /EXEC ACMSQDF $DISK1:[MYDIR]ACMSQDF.DAT
```

When you are using the ACMSQUEMGR Utility, you can use any access mode for the ACMSQDF logical. However, at run time, ACMS Queued Task Services require that ACMSQDF be an executive-mode logical name. If you expect a queue definition file to exist when you run ACMSQUEMGR, check that the logical name ACMSQDF is pointing to the correct file specification.

5.3. Managing Task Queues

Use the following ACMSQUEMGR commands to create and manage ACMS task queues:

- **CREATE QUEUE**
- **SET QUEUE**
- **MODIFY QUEUE**
- **DELETE QUEUE**
- **SHOW QUEUE**

These commands are described in the following sections.

5.3.1. Creating Task Queues

You use the **CREATE QUEUE** command to create a task queue. Once you have created a queue, it can be reached through the ACMS$QUEUE_TASK service to enqueue elements to the queue, and also by the QTI to process the elements in the queue. The following command creates a queue called PERS_QUEUE. Because this command does not include a full file specification for the queue, the ACMSQUEMGR Utility creates the queue SYS$SYSTEM:PERS_QUEUE.DAT.

```
ACMSQUEMGR> CREATE QUEUE PERS_QUEUE
```

When you use the **CREATE QUEUE** command to create a queue, the ACMSQUEMGR Utility sets the owner of the queue file to [1,4] and sets the protection of the file to S:RWED,O:RWED,G,W. Therefore, to access the queue file, a user must have a system UIC or must have the SYSPRV privilege.

5.3.2. Setting the Characteristics of Task Queues

You can dynamically control the availability of task queues by using the **SET QUEUE** command. For example, the **SET QUEUE** command can be used to prevent queued task elements from being queued to a task queue. Likewise, the **SET QUEUE** command can prevent queued task elements from being dequeued from a task queue.

When you use the **SET QUEUE** command, you must use either the **/DEQUEUE** or **/ENQUEUE** qualifier.

The **/ENQUEUE** qualifier allows or disallows queued task elements to be queued. The following example disables the queuing of queued task elements to queue HISTORY_QUE:

```
ACMSQUEMGR> SET QUEUE /ENQUEUE=SUSPENDED HISTORY_QUE
```

When the enqueue state of a task queue is set to SUSPENDED, the ACMS$QUEUE_TASK service returns an error when elements are queued to the task queue. Use **/ENQUEUE=RESUMED** to enable queuing of elements.

Allow or disallow the QTI to dequeue all queued task elements in a queue by using the **/DEQUEUE** qualifier. Dequeuing is the process whereby the QTI reads and then deletes a queued task element to make a task available for processing. The **/DEQUEUE** qualifier in the following command specifies that no queued task elements can be dequeued from MY_QUE. No queued task elements are processed until you set the dequeue state to RESUMED.

```
ACMSQUEMGR> SET QUEUE /DEQUEUE=SUSPENDED MY_QUE
```

By using the **/DEQUEUE=SUSPENDED** qualifier, you can allow tasks to be queued to a queue, but suspend their processing. When dequeues are suspended, the ACMS$DEQUEUE_TASK service returns an error. When you want tasks to be processed by the QTI, specify the **/DEQUEUE=RESUMED** qualifier.

5.3.3. Modifying Task Queues

You can modify the static characteristics of a task queue by using the **MODIFY QUEUE** command. This can include changing the disk where a queue repository file is located, or increasing the maximum workspace size for a task queue to allow for the size requirements of a new task in your application. In any case, you do not need to modify the characteristics of a task queue on a frequent basis.

The **MODIFY QUEUE** command requires exclusive access to the task queue. Make sure that no processes have access to the queue by setting the enqueue and dequeue state of the task queue

to suspended. To do this, use the **SET QUEUE** command and then stop the queue with the **ACMS/STOP QUEUE** command.

The following command modifies the maximum workspace size allowed for a queued task element in task queue PAY_QUE:

```
ACMSQUEMGR> MODIFY QUEUE PAY_QUE/MAX_WORK=450
```

Use the **/FILE_SPECIFICATION** qualifier with the **MODIFY QUEUE** command to specify the name of a new queue repository file. The queue repository file contains the queued task elements for a queue and is created when you create the queue with the **CREATE QUEUE** command. The following command changes the location of the queue repository file for queue MY_QUE:

```
ACMSQUEMGR> MODIFY QUEUE MY_QUE/FILE_SPEC=DISK2:MY_QUE.DAT
```

5.3.4. Deleting Task Queues

Use the ACMSQUEMGR **DELETE QUEUE** command to delete a task queue. To delete a task queue, you need to delete access to the queue repository file, and the task queue must be stopped. The following command deletes task queue PAY_QUE:

```
ACMSQUEMGR> DELETE QUEUE PAY_QUE
```

The **/PURGE** qualifier deletes all queued task elements in the queue when you delete the queue. For example:

```
ACMSQUEMGR> DELETE QUEUE/PURGE PAY_QUE
```

If you do not specify the **/PURGE** qualifier and there are queued task elements in the task queue, ACMSQUEMGR is unable to delete the task queue and displays an error message.

5.3.5. Displaying Task Queue Information

The **SHOW QUEUE** command displays information about task queues currently defined in the queue definition file. The **SHOW QUEUE** command in *Example 5.1, "ACMSQUEMGR SHOW QUEUE Command"* displays information about the queue PAYROLL_QUE. You can display information about all queues by using the wildcard character (*).

Example 5.1. ACMSQUEMGR SHOW QUEUE Command

```
ACMSQUEMGR>
SHOW QUEUE PAYROLL_QUE

❶ Queue Name: PAYROLL_QUE
❷ Enqueues State:  RESUMED ❸ Dequeues State:  RESUMED   ❹ Max Wsp Size:
256
❺ File Specification:  SYS$SYSTEM:PAYROLL_QUE.DAT
```

The following is a description of the numbered items in *Example 5.1, "ACMSQUEMGR SHOW QUEUE Command"*:

❶ Queue Name

The name of the task queue.

❷ Enqueues State

Whether or not new tasks can be queued. If the enqueues state is enabled, new tasks can be queued. If it is disabled, they cannot be queued.

❸ Dequeues State

If the dequeues state is enabled, queued tasks can be removed from the queue. If it is disabled, they cannot be removed.

❹ Max Wsp Size

The maximum total size (in bytes) of workspaces allowed in a queued task element.

❺ File Specification

The file specification of the queue repository file. The queue repository file stores the queued task elements. By default, the queue repository file has the file specification SYS$SYSTEM: *queue-name*.DAT; however, you can specify another file specification by using the **/FILE_SPECIFICATION** qualifier with the **CREATE QUEUE** command.

See *Chapter 20, "ACMSQUEMGR Commands"* for more information about the **SHOW QUEUE** command.

5.4. Managing Queued Task Elements

Use ACMSQUEMGR commands to:

- Alter the processing priority or state of a queued task element
- Delete a queued task element
- Display information about a queued task element

The commands you can use to perform these operations are described in the following sections.

Associated with each queued task element is an element ID. The element ID is returned by the ACMS$QUEUE_TASK programming service. ACMSQUEMGR commands that perform operations on queued task elements require that you specify the element ID of the queued task element. This implies that your application program, which called the ACMS$QUEUE_TASK programming service, made available to you the element ID. Another way to obtain an element ID is to display all queued task elements (or a subset thereof) using the ACMSQUEMGR command **SHOW ELEMENT** (see *Section 5.4.3, "Displaying Queued Task Elements"*). Then, once you locate the element you are interested in, note its element ID.

If you specify a partial element ID, the omitted fields are wildcarded. For example, an element ID of ABCD:: matches all element IDs beginning with ABCD::; that is, all elements enqueued from node ABCD. See *Chapter 20, "ACMSQUEMGR Commands"* for more information about specifying an element ID.

Although you can perform operations on specific queued task elements by specifying element IDs, you can use the wildcard character (*) instead of an element ID, and then use the **/SELECT**, **/EXCLUDE**, and **/CONFIRM** qualifiers to limit the scope of the command to the specified elements. This approach is best if you do not know the element ID or you want to perform operations on several elements at once.

For example, the following command deletes all queued task elements in queue INVENTORY_QUE for tasks UPDATE_PART1 and UPDATE_PART2 that were queued today but are not priority 1 or 2:

```
ACMSQUEMGR> DELETE ELEMENT * INVENTORY_QUE -
_ACMSQUEMGR> /SELECT=(TASK=(UPDATE_PART1,UPDATE_PART2), -
_ACMSQUEMGR> SINCE=TODAY) -
_ACMSQUEMGR> /EXCLUDE=PRIORITY=(1,2)
```

5.4.1. Setting the Characteristics of Queued Task Elements

Set the state or priority of a queued task element with the ACMSQUEMGR **SET ELEMENT** command. Setting the attributes of a queued task element allows you to control how it is dequeued.

Setting the priority of an element allows you to control when the element is dequeued relative to other elements in the queue. You can specify a priority of 0 through 255. The QTI and the ACMS$DEQUEUE_TASK service dequeue highest priority elements first, and, within priority, dequeue elements on a first-in/first-out (FIFO) basis. For example, if all queued task elements in a queue are set at priority 10, then normally they would be processed in FIFO order. To cause a particular queued task element to be processed first, you issue the following command:

```
ACMSQUEMGR> ELEMENT NODE1:22D00082-0000000E PARTS_QUE /PRIORITY=11
```

To control whether or not the QTI and the ACMS$DEQUEUE_TASK service dequeue a queued task element, use the **/STATE** qualifier with the **SET ELEMENT** command. For instance, if you set the state of a queued task element to HOLD, then the element is not dequeued from the queue. For example:

```
ACMSQUEMGR> SET ELEMENT NODE1:22D00082-0000000E PARTS_QUE -
_ACMSQUEMGR> /STATE=HOLD
```

Setting an element to HOLD is useful when you want to start a queue, but do not want certain elements to be processed by the QTI. To allow a queued task element to be dequeued, specify **/STATE=NOHOLD**.

You can specify a wildcard character (*) instead of an element ID, and use the **/SELECT** or **/EXCLUDE** qualifiers to limit the scope of the command.

For example, if you want the QTI to process queued task elements for the task UPDATE_INVENTORY only between the hours of 6:00 and 10:00 at night, then set the state of the queued task elements to HOLD and submit a batch job to run at 6:00 that issues the following command:

```
ACMSQUEMGR> SET ELEMENT * INVENTORY_QUE /STATE=NOHOLD -
_ACMSQUEMGR> /SELECT=TASK=UPDATE_INVENTORY
```

Assuming that INVENTORY_QUE is started, then these elements are now available for dequeuing and processing by the QTI. If you want processing to stop at 10:00 P.M. that evening, run a batch job at that time containing the following command:

```
ACMSQUEMGR> SET ELEMENT * INVENTORY_QUE /STATE=HOLD  -
_ACMSQUEMGR> /SELECT=TASK=UPDATE_INVENTORY
```

5.4.2. Deleting Queued Task Elements

Use the **DELETE ELEMENT** command to delete one or more queued task elements in a task queue. Identify a particular element to delete by specifying part or all of an element ID, or use the wildcard character (*) to delete all queued task elements in a queue. This command deletes all queued task elements submitted from node AVERTZ in queue MY_QUE:

```
ACMSQUEMGR> DELETE ELEMENT AVERTZ:: MY_QUE
```

Use the **/SELECT** or **/EXCLUDE** qualifiers to select a category of queued task elements to delete, or exclude a category from being deleted. The following command deletes all queued task elements submitted before today on queue PAY_QUE:

```
ACMSQUEMGR> DELETE ELEMENT * PAY_QUE /SELECT=BEFORE=TODAY
```

5.4.3. Displaying Queued Task Elements

The **SHOW ELEMENT** command displays one or more queued task elements in a queue. Unless you specify the **/FULL** qualifier, brief information is provided by default. The brief display contains the following information:

- Task name
- Element state
- Application name
- Element priority

When you use the **/FULL** qualifier, the following additional information is displayed. See *Example 5.2, "ACMSQUEMGR SHOW ELEMENT/FULL"* for an example of a full display.

- Enqueuer user name
- Time the task element was created
- Queue name
- Element ID
- Error count (if any) for the queue element
- Task error (if any)

Example 5.2. ACMSQUEMGR SHOW ELEMENT/FULL

```
ACMSQUEMGR> SHOW ELEMENT * INVENTORY_QUE/FULL
        ACMS Queued Tasks                    Current Date/Time: 2-FEB-1994
 13:21:31.13
 ❶    Task:  PARTS_AVAIL           ❷  State:     NOHOLD
 ❸    Appl:  SITE_INVENT           ❹  Priority:  20
 ❺    Username:   NORTH            ❻  Enq Time:  2-FEB-1994 10:13:17.71
 ❼    Queue Name: PAYROLL_QUEUE
 ❽    Element Id: MYNODE::28C00082-0000000F-FDE272E0-0090AB3F
 ❾    Error Cnt:  1
 ❿   Last Error:  %ACMS-E-NOSUCH_PKG, There is no such package defined
 ⓫   Error Time:  2-FEB-1994 11:38:39.24


    Task:  PARTS_REQ                       State:     NOHOLD
    Appl:  SITE_INVENT                       Priority:  20
    Username:   JONES                        Enq Time:  15-JAN-1994
 10:13:16.85
    Queue Name: PAYROLL_QUEUE
```

```
    Element Id: MYNODE::28C00082-0000000E-FD5F3920-0090AB3F
    Error Cnt:  0
    Queued Task total for this display: 2
```

The following is a description of the numbered items in *Example 5.2, "ACMSQUEMGR SHOW ELEMENT/FULL"*:

❶ Task

The name of the task.

❷ State

The processing characteristics of the task element – whether it is set to HOLD or NOHOLD.

❸ Appl

The name of the application containing the task.

❹ Priority

The priority of the queued task element.

❺ Username

The enqueuer user name specified explicitly or implicitly with ACMS$QUEUE_TASK service.

❻ Enq time

The time the queued task element was created.

❼ Queue name

The name of the task queue.

❽ Element ID

The ID for the queued task element.

❾ Error cnt

The number of times this queued task element has failed.

❿ Last error

The last error that occurred while attempting to process the queued task element. This field is not displayed when the error count is zero.

⓫ Error time

The time that the last error occurred. This field is not displayed when the error count is zero.

A queued task element within a queue can have two states: HOLD and NOHOLD. Each of these states can be further qualified to yield a total of four different states/substates:

- NOHOLD – The element is available for processing by the QTI, or available for dequeuing by the ACMS$DEQUEUE_TASK service.

- NOHOLD (LOCKED) – The element is locked because it is currently being processed by the QTI, or it is being dequeued by the ACMS$DEQUEUE_TASK service.
- HOLD – The element is not available for processing by the QTI or for dequeuing by the ACMS$DEQUEUE_TASK service. If an element in this state is set to NOHOLD using the ACMSQUEMGR, then the element immediately becomes a candidate for subsequent dequeue operations (either by the QTI or by the ACMS$DEQUEUE_TASK service).
- HOLD (RETRY PENDING) – The element has been processed by the QTI and the called task failed. The QTI retries the task call at a later time depending on the value of the ACMSGEN QTI_RETRY_TIMER parameter. At the appropriate time, the QTI sets the element to NOHOLD, allowing the element to become a candidate for subsequent dequeue operations by either the QTI or the ACMS$DEQUEUE_TASK service. If an element in this state is set to HOLD using ACMSQUEMGR, then the QTI does not automatically set the element back to NOHOLD. If an element in this state is set to NOHOLD using the ACMSQUEMGR, then the element immediately becomes a candidate for subsequent dequeue operations.

5.5. Backing Up Task Queue Files Online

ACMS task queue files can be backed up without the QTI process being stopped and without terminating programs that call the ACMS$QUEUE_TASK and ACMS$DEQUEUE_TASK services. To perform an online backup of your task queue files:

- Use the ACMS operator command **ACMS/STOP QUEUE** to stop each queue that needs to be backed up.
- Use the ACMSQUEMGR Utility to suspend dequeues and suspend enqueues for each queue that needs to be backed up. This causes ACMS to close the queue files that are opened in processes calling the ACMS$QUEUE_TASK and ACMS$DEQUEUE_TASK services. If the queue file is participating in a transaction at the time ACMSQUEMGR suspends the dequeue or enqueue, the queue file cannot be closed. If the queue file cannot be closed for that reason, another close is retried 10 seconds later. If the queue file is not closed after 10 retries then the file is left open and an error is logged to SWL.
- Back up the queue files that need to be backed up.
- Use the ACMSQUEMGR Utility to resume dequeues and resume enqueues for each queue that was backed up.
- Use the ACMS operator command **ACMS/START QUEUE** for each queue that was backed up.

For programs that call the ACMS$QUEUE_TASK and ACMS$DEQUEUE_TASK services to continue while a backup of a queue file is taking place, the programs must check the return statuses of ACMS$_QUEDEQSUS and ACMS$_QUEENQSUS. See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for details.

5.6. Summary of ACMSQUEMGR Commands and Qualifiers

QUEMGR commands allow you to create and manage ACMS queues. *Table 5.1, "Summary of ACMSQUEMGR Commands"* lists the ACMSQUEMGR commands and qualifiers and provides a brief description of each command. See *Chapter 20, "ACMSQUEMGR Commands"* for a complete description of the ACMSQUEMGR commands and qualifiers.

Table 5.1. Summary of ACMSQUEMGR Commands

Commands and Qualifiers	Description
CREATE QUEUE /DEQUEUE=*keyword* /ENQUEUE=*keyword* /FILE_SPECIFICATION=*file-spec* /MAX_WORKSPACES_SIZE=*n*	Creates a queue for queued task elements.
DELETE ELEMENT /[NO]CONFIRM /EXCLUDE=*keyword* /SELECT=*keyword*	Deletes one or more queued task elements.
DELETE QUEUE /[NO]PURGE	Deletes a queue.
EXIT	Exits the ACMSQUEMGR Utility.
HELP /[NO]PROMPT	Provides information about ACMSQUEMGR commands.
MODIFY QUEUE /FILE_SPECIFICATION=*file-spec* /MAX_WORKSPACES_SIZE=*n*	Modifies the static characteristics of a queue.
SET ELEMENT /[NO]CONFIRM /EXCLUDE=*keyword* /PRIORITY=*n* /SELECT=*keyword* /STATE=[NO]HOLD	Sets the state and/or priority of one or more queued task elements.
SET QUEUE /DEQUEUE=*keyword* /ENQUEUE=*keyword*	Dynamically sets the queue state.
SHOW ELEMENT /BRIEF /EXCLUDE=*keyword* /FULL /OUTPUT[=*file-spec*] /SELECT=*keyword* /TOTAL_ONLY	Displays one or more queued task elements in a queue.
SHOW QUEUE /OUTPUT[=*file-spec*]	Displays the characteristics of a queue.

Chapter 6. Using Distributed Forms Processing

This chapter describes how to set up applications with **distributed forms processing** in a transaction processing (TP) system. Applications with distributed forms processing are sometimes called distributed applications.

6.1. What Is Distributed Forms Processing?

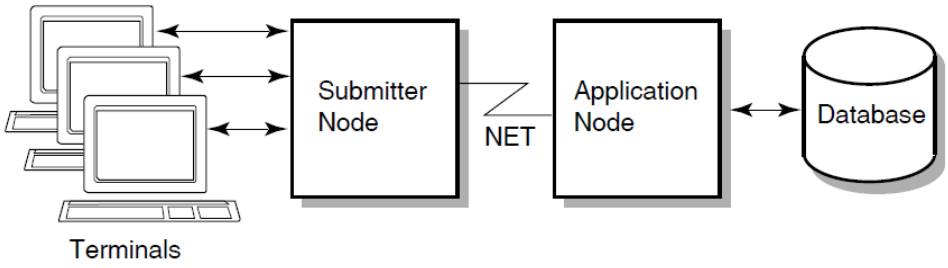
An ACMS application consists of forms processing and database processing. In a distributed ACMS TP system, one or more nodes, called the **back end**, handle the database processing and computation, while the forms processing is offloaded onto another node or set of nodes called the **front end**. The front end is sometimes referred to as the **submitter** node or nodes, and the back end is sometimes referred to as the **application** node or nodes.

This distribution of tasks over more than one node in a distributed system improves the speed and reliability of ACMS transactions by allowing the configuration of a distributed system where more powerful machines are dedicated to database processing and smaller machines handle the forms processing. You can configure each node in the distributed system for the processing of specific tasks.

Reliability of a system can be enhanced by installing applications on more than one node of a system and using search lists so that, if a node fails, users are switched to a second node where the same application is running.

Figure 6.1, "Distributed Forms Processing" shows an example of a typical distributed ACMS system.

Figure 6.1. Distributed Forms Processing



On the front end, or submitter node, terminal users use menus to select tasks for applications running on the application node. The applications, in turn, interact with **resource managers** such as Rdb, DBMS, and RMS. Resource managers are the tools which manipulate your data. A distributed system can be established in an OpenVMS Cluster, a local-area network, or a wide-area network. ACMS uses DECnet to communicate between the front end and the back end of a distributed system.

The front-end system is often called the **submitter node** because it refers to a node on which tasks are being selected. The back-end system is often called the **application node** because it refers to the node where the application is executing and where all the actual processing of an application takes place.

Because many applications can run at a single time on one distributed system, it is important that application specifications in menu definitions on the submitter node point to the correct applications on the application node. *Section 6.3, "Defining Application Specifications"* describes how you define

application specifications for a distributed TP system. The following section describes what you must do to enable your system for distributed forms processing.

6.2. Preparing Your System for Distributed Forms Processing

Once you have designed your distributed system to the extent of deciding which nodes are to be used as the front end and which nodes are to be used as the back end, you can configure each node in your system for distributed forms processing. This section describes actions the system manager takes to enable processing of applications with distributed forms. This includes actions that must be taken in all environments and some actions that are specific to an OpenVMS Cluster environment, submitter nodes, or application nodes.

6.2.1. Common Setup Tasks for Distributed Forms Processing

The following procedures must be performed for both submitter and application nodes to set up your system for processing distributed forms processing:

- You must set the node name parameter in the ACMS parameter file before ACMS makes use of DECnet. The recommended way to set the node name parameter is to edit the ACMVARINI.DAT file in SYS$MANAGER to include a line that specifies the DECnet node name of the system. For example:

  ```
  .
  .
  .
  NODE_NAME="MYNODE"
  .
  .
  .
  ```

- The node name you specify in the ACMS parameter file must be the same as your DECnet node name. By default, the NODE_NAME parameter is null, and ACMS disables distributed processing. When you assign a node name, ACMS enables distributed processing, provided that DECnet is running.

- Invoke the ACMSPARAM.COM procedure in SYS$MANAGER to apply the change to the ACMS parameter file.

  Note

  In an OpenVMS Cluster environment, you must ensure that the ACMS parameter file, ACMSPAR.ACM, is stored in the SYS$SPECIFIC directory before invoking the ACMSPARAM.COM command procedure. Because each node has a different DECnet node name, each node must have its own node-specific ACMSPAR.ACM file. Check this on each node of the cluster.

- Alternatively, you can run the ACMSGEN Utility directly. Run the ACMSGEN Utility as follows:

  ```
  $ RUN SYS$SYSTEM:ACMSGEN
  ```

```
ACMSGEN> SET NODE_NAME DOVE
ACMSGEN> WRITE CURRENT
```

Note that **WRITE CURRENT** was used in the preceding example. This ensures that a new ACMSPAR.ACM file is not created where one already exists. It also provides a check that the file exists on each node in an OpenVMS Cluster.

Finally, note that regardless of which method you use to set the node name parameter, you must stop and restart the ACMS system for the change to take effect.

6.2.2. Actions Required on Submitter Nodes

After you have completed the actions listed in *Section 6.2.1, "Common Setup Tasks for Distributed Forms Processing"* detailing common steps that must be taken, the following additional actions are needed to enable distributed processing on a submitter, or front-end, node:

- Ensure that application specifications in menu definitions point to the application, or back-end, node.

  Logical names provide a way to ensure that application specifications in menu database files (.MDB files) refer to the correct applications on the application node. See *Section 6.3, "Defining Application Specifications"* for information about how to use logical names for application specifications.

- Place DECforms escape routines in a protected directory.

  A DECforms escape routine is an ACMS application program subroutine that is called during the processing of an external DECforms exchange request. See *Section 6.6, "Managing and Caching DECforms Escape Routine Files"* for a description of managing DECforms escape routines.

6.2.3. Actions Required on Application Nodes

Make sure that each step in *Section 6.2.1, "Common Setup Tasks for Distributed Forms Processing"* has been completed. Then, take these additional steps to enable distributed processing by authorizing remote access to ACMS on the application node.

The system manager on an application node can authorize remote task submitter nodes using these methods:

- By assigning individual ACMS proxy accounts to task submitters
- By assigning individual OpenVMS proxy accounts to task submitters
- By assigning a default submitter user name account for those task submitters who do not have individual proxies
- By creating a single wildcard proxy account for all submitters in the case where the submitter and application nodes are in a single OpenVMS Cluster

These methods are described in the following paragraphs.

When ACMS uses a proxy account or a default submitter user name for a remote task submitter, tasks executed by the remote submitter are executed as if they were selected by a local task submitter using the same account. If a proxy or default submitter user name does not exist for a remote task submitter, ACMS rejects the remote task selection.

6.2.3.1. Assigning Individual Proxy Accounts

The ACMS proxy enables system managers to give ACMS users on remote nodes access to ACMS applications on application nodes without granting access to other files and OpenVMS resources on the application node.

Note

For existing ACMS sites, simply adding a new user proxy to the ACMS proxy file does not make a system more secure. You must also remove the user's proxy from the OpenVMS proxy file to deny users on remote nodes access to other files and OpenVMS resources.

6.2.3.1.1. How ACMS Searches for a User's Proxy

When a user on a remote node first attempts to select a task on the application node, the following occurs:

1. The ACC on the application node checks that the ACMS proxy file, ACMSPROXY.DAT, exists.
2. If the ACMSPROXY.DAT file exists, the ACC checks the file contents for the proxy of the user on the remote node.

   If the remote user's proxy is in the file, the user is authorized to select the task.

   If the ACMSPROXY.DAT file does not exist, or if the remote user's proxy is not in the file, the procedure in the next step is followed.
3. The ACC on the application node checks the OpenVMS proxy file, NETPROXY.DAT, for the remote task submitter's proxy.
4. If the proxy file exists and the remote user's proxy is in the NETPROXY.DAT file, the user is authorized to select the task.
5. If the proxy file does not exist or no proxy exists in NETPROXY.DAT, the ACC checks if the USERNAME_DEFAULT parameter is defined in the ACMS parameter file, ACMSPAR.ACM. The USERNAME_DEFAULT parameter defines the default submitter user name account used for remote task submitters that do not have an individual proxy account, or for task submitters from non-ACMS agents.
6. If the parameter is defined in ACMSPAR.ACM, the remote user is authorized to select tasks.
7. If the USERNAME_DEFAULT parameter is not defined and there is no OpenVMS proxy, the ACC rejects the remote user.

6.2.3.1.2. Deciding Which Proxy to Use

To decide which type of proxy is appropriate for a user on a remote node, first determine the type of access to the system that the user needs and what level of security is required. Then, decide whether to create an OpenVMS proxy, an ACMS proxy, or both.

Before making changes in the security level of users on remote nodes, consider the needs of the following types of users:

- OpenVMS only user

This user needs to access files and other OpenVMS resources on the application node, but does not need to select ACMS tasks on that node.

- ACMS only user

  This user needs to select ACMS tasks on the application node, but does not require access to OpenVMS.

- OpenVMS and ACMS user

  This user requires OpenVMS access and also needs to select ACMS tasks on the application node.

Table 6.1, "Proxy Choices" identifies the types of proxies these users require.

Table 6.1. Proxy Choices

	OpenVMS Proxy	ACMS Proxy
OpenVMS Only User	+	
ACMS Only User		+
OpenVMS and ACMS User	+	+

An OpenVMS proxy allows users to select ACMS tasks remotely and users on remote nodes to access other files and OpenVMS resources on the application node.

An ACMS proxy allows users to select ACMS tasks remotely. Unlike an OpenVMS proxy, an ACMS proxy does not grant users on remote nodes access to any other files or OpenVMS resources on the application node, except through an ACMS task.

6.2.3.1.3. Setting Up the ACMS Proxy File

Use the ACMS User Definition Utility (UDU) to create and maintain the ACMS proxy file, ACMSPROXY.DAT. This file contains the mapping of <remote-node>::<remote-user> to <local-user>.

You also use UDU to add, remove, and display the proxy specifications in the ACMS proxy file. The UDU interface, including the command syntax and the use of wildcards, is similar to the proxy command interface in the OpenVMS Authorize Utility.

By default, UDU and run-time ACMS look for the ACMS proxy file, ACMSPROXY.DAT, in two different places:

- In the current directory for UDU
- In the file location SYS$SYSTEM:ACMSPROXY.DAT for run-time ACMS

UDU looks for the default ACMS proxy file ACMSPROXY.DAT in the current directory. You can define the logical name ACMSPROXY to specify another location for the file, define it in any logical name table in your process directory table, and in any access mode.

The SYS$SYSTEM:ACMSPROXY.DAT file location is the run-time default specification of the proxy file. You can define the system-level executive-mode logical name ACMSPROXY to specify an alternate file location, which the ACMS run-time system uses. For example, issue the following command to create the proxy file FOO.BAR in the SYS$TEST directory:

```
$ DEFINE/SYSTEM/EXECUTIVE ACMSPROXY SYS$TEST:FOO.BAR
```

If the ACC encounters any problems the first time it opens the ACMS proxy file, an error message is written to the SWL log file.

If you want the proxy file to be in SYS$SYSTEM and accessible to all nodes in the cluster, you must specify a SYS$COMMON directory, not SYS$SPECIFIC. In order for ACMS to search the file for remote proxies, the ACC process must be able to read the ACMS proxy file.

To allow ACC access to the ACMS proxy file, perform one of the following actions:

- Set the ACMS proxy file owner UIC to be the same as the UIC of the ACC or the SYSTEM account.
- Set the ACMS proxy file protection so that the ACC process has read access.

6.2.3.1.4. Creating ACMS Proxies

To implement the ACMS proxy, perform the following steps:

1. Create the proxy file and add entries for remote users who need to select tasks in ACMS applications.
2. Create proxies in the OpenVMS proxy file for remote users who additionally require access to other files and OpenVMS resources.
3. Remove proxies in the OpenVMS proxy file for existing users on remote nodes who need only to select tasks in ACMS applications. Add these users to the ACMS proxy instead.

Performing these operations increases security and also ensures that the use of the ACMS proxy mechanism does not cause a degradation in ACMS performance. When ACC needs to search only one proxy file for a proxy, the ACMS performance is the same as in Version 3.2. However, even when ACMS needs to search both the ACMS and OpenVMS proxy files, there is only slight negative impact on the performance of ACMS.

The format you choose for creating ACMS proxies has security implications. The following formats are listed from most secure to least secure. The ACC process follows this order when it searches the ACMS proxy file for a match with a remote user proxy. If the ACC finds no match in the search list, it searches the OpenVMS proxy file in the same order for a remote user proxy.

- An exact match of remote-node::remote-user

  This is the most secure way to set up ACMS proxies. This format allows only a specified user on a specified node to select tasks on the application node.

- A match of remote-node::*

  Use this format to create ACMS proxies in an OpenVMS Cluster environment, where the submitter and application nodes are in the same cluster.

  You can also use this format outside an OpenVMS Cluster environment, but you need to understand its security implications; this format allows any user on the submitter node to select tasks on the application node.

- A match of *::remote-user

This format allows a user with a specified user name on any node in the network to select tasks on the application node.

- A match of *::*

  This is the least secure format; it allows any user on any node to select tasks on the application node.

The application node ACC checks for a remote task submitter's proxy. In addition, the application node ACC requests that the submitter node ACC validate the task submitter based on a security token and submitter ID that the submitter node ACC assigned to the user. When the task submitter first enters ACMS, the submitter node ACC verifies the following items to make sure that the user is authorized:

- Submitter terminal is in ACMSDDF.DAT
- Submitter user name is in SYSUAF.DAT
- Submitter user name is in ACMSUDF.DAT

6.2.3.1.5. Creating OpenVMS Proxies

The OpenVMS proxy file can have more than one <local-user> for each <remote-node>::<remote-user> combination. The ACMS proxy file, on the other hand, can have only one <local-user> for each <remote-node>::<remote-user> combination. Therefore, for an OpenVMS proxy, you must specify a default <local-user>. This allows ACMS, when it searches the OpenVMS proxy file, to find one <local-user> to associate with <remote-node>::<remote-user> for the remote user proxy.

For example, to allow user JONES on the submitter node COWBOY to select tasks under the user name PERS, create an OpenVMS proxy account as follows:

```
UAF>  CREATE/PROXY COWBOY::JONES PERS/DEFAULT
```

When starting DECnet, to allow remote users access to files and other OpenVMS resources, issue the NCP command **SET KNOWN PROXIES ALL**. If you do not execute this command on a node, remote users do not have access to files and other OpenVMS resources. However, ACMS opens and reads the OpenVMS proxy file and the ACMS proxy file whether or not you enable OpenVMS proxy access to files and OpenVMS resources with NCP.

6.2.3.2. Assigning a Default Submitter User Name Account

The recommended way to set the default submitter user name is by editing the ACMVARINI.DAT file in SYS$MANAGER. Include a line that specifies the default submitter user name.

```
.
.
.
USERNAME_DEFAULT = "ACMS_USER"
.
.
.
```

Invoke the ACMSPARAM.COM procedure in SYS$MANAGER to apply the change to the ACMS parameter file. Note that in an OpenVMS Cluster environment, you must ensure that the ACMS parameter file, ACMSPAR.ACM, is stored in the SYS$SPECIFIC:[SYSEXE] directory before invoking the ACMSPARAM.COM command procedure. The value you assign to the USERNAME_DEFAULT

parameter is used as the submitter user name if ACMS cannot find a specific proxy user name for a remote submitter.

You can also define a default submitter user name using the ACMSGEN Utility. For example:

```
$ RUN SYS$SYSTEM:ACMSGEN
ACMSGEN> SET USERNAME_DEFAULT ACMS_USER
ACMSGEN> WRITE CURRENT
```

The **SET** command defines ACMS_USER as the new default submitter user name, which the **WRITE CURRENT** command uses to update the current setting. The user name you set as the USERNAME_DEFAULT must be authorized by the OpenVMS Authorize Utility, and must exist in the ACMS User Definition File.

6.2.3.3. Assigning Proxy Accounts in an OpenVMS Cluster Environment

In an OpenVMS Cluster environment, where the submitter and application nodes are in the same cluster, you can create a wildcard proxy account for all users on a submitter node.

For example, to allow all users on the submitter node, COWBOY, to select tasks on an application node, you create a proxy account for users with the OpenVMS Authorize Utility:

```
UAF> CREATE/PROXY COWBOY::* */DEFAULT
```

Note that this technique can also be used outside an OpenVMS Cluster environment, but the security implications should be well understood. Specifically, the system manager on the application node must understand that this method allows any user on the submitter node access to the application node.

6.2.4. File Protection for Application and Form Files

You must also ensure that application and form files have the correct file protection assigned.

When a terminal user on the submitter node selects a task in an application on the application node, ACMS automatically copies the application database and forms files used by the application from the application node to the submitter node. For ACMS to automatically distribute these files, they must be accessible by the ACMS Central Controller (ACC) and the CP on the submitter node, or remote task selections fail. You can ensure that these files are accessible on the application node by giving them WORLD:RE protection. See *Section 6.4, "Distributed Operations ACMS Performs Automatically"* for more information about how ACMS performs this automatic distribution.

Alternatively, if you do not wish to change the protection of the application databases and form files to WORLD:RE, you can create proxy accounts on the application node for the ACC and CP user names on the submitter node. The following example shows how to allow the ACC and CP processes on the submitter node, COWBOY, to access their respective files on an application node. The example assumes that on both the submitter and the application nodes, the ACC and CP processes run under the ACMS$ACC and ACMS$CP user names.

```
UAF> ADD/PROXY COWBOY::ACMS$ACC ACMS$ACC/DEFAULT
UAF> ADD/PROXY COWBOY::ACMS$CP ACMS$CP/DEFAULT
```

Note

If a proxy account is created on the application node for the ACC or CP processes on the submitter node, ensure that the account on the application node is authorized for network access and that it is not defined

with the **/DISUSER** qualifier. Failure to do this prevents a cache operation from taking place and causes the task selection to fail.

ACMS uses the DFECnet File Access Listener (FAL) object to copy from one node to another. FAL is an object that is defined by default in the DFECnet configuration database. This FAL object must exist and be enabled for ACMS to distribute needed files from one node to another.

To confirm that the FAL object is present, you can use the Network Control Program (NCP) **SHOW** command. First use RUN SYS$SYSTEM:NCP to obtain the NCP> prompt. At the NCP> prompt, type **SHOW** and at the following prompts, type **OBJECT** and **FAL**, as shown in the following example:

```
$ RUN SYS$SYSTEM:NCP
NCP> SHOW
(ACTIVE, ADJACENT, AREA, CIRCUIT, EXECUTOR,
KNOWN, LINE, LOGGING, LOOP, MODULE, NODE, OBJECT):
OBJECT Object name (8 characters):
FAL
Object Volatile Summary as of 21-JUL-1989 14:57:57
      Object   Number  File/PID              User Id          Password
     FAL           17  FAL.EXE NCP>
EXIT
$
```

You must also ensure that files needed for DECforms escape routines have the correct file protection assigned.

Place DECforms escape routines in a restricted directory because they contain user-written code that runs in a privileged process. DECforms escape routines are not distributed automatically by ACMS. Hence, the system manager on the submitter node needs to copy these files manually from the application node. Consequently, make sure the files are accessible to the submitter node. See *Section 6.6, "Managing and Caching DECforms Escape Routine Files"* for a description of managing DECforms escape routines.

6.3. Defining Application Specifications

In a distributed TP system, it is important that the application specifications in menu definitions point to the node on which the application is running.

You can "hardcode" an application file name and node name in the menu definition, or use a logical name to reference the application. Logical names allow you to change the application to which a menu definition or definitions refers by simply redefining a logical name. This avoids the need to redefine and rebuild a menu definition. If an application is installed on more than one node in the system, you can define a logical name to translate to a search list specifying all locations for the application. The following sections describe how to define logical names and search lists.

6.3.1. Using Logical Names for Applications

If task submitters on the submitter node access several applications that are always stored together on another node, define a logical name for that node. For example, if the applications ACCOUNTING, PERSONNEL, and BUDGET are all installed on node DOVE, place the following logical name assignment in the system startup file:

```
$ DEFINE/SYSTEM APPL_NODE DOVE::
```

The menu definitions can refer to APPL_NODE::ACCOUNTING, APPL_NODE::PERSONNEL, and APPL_NODE::BUDGET. Then, if you need to move these applications to another node, you can simply redefine APPL_NODE to be the new node name without changing the menu definitions.

Example 6.1, "Using a Logical Name for a Node" shows how a menu definition refers to the node DOVE after it has been defined with the logical name APPL_NODE as explained in the previous paragraphs.

Example 6.1. Using a Logical Name for a Node

```
 ENTRIES ARE:
.
.
.
NEW_EMPLOYEE: TASK IS NEW_EMPL_TASK IN "APPL_NODE::PERSONNEL";
.
.
.
END ENTRIES;
```

If you want control of specific applications rather than groups of applications, define a logical name for that application. For example, if the application PAYROLL is installed on node DOVE, place this command in the system startup file:

```
$ DEFINE/SYSTEM PAYROLL DOVE::PAYROLL
```

The menu definition simply refers to PAYROLL, as in *Example 6.2, "Using a Logical Name for an Application"*.

Example 6.2. Using a Logical Name for an Application

```
ENTRIES ARE:
.
.
.
NEW_EMPLOYEE: TASK IS NEW_EMPL_TASK IN "PAYROLL";
.
.
.
END ENTRIES;
```

When an ACC on a submitter node asks an application node for an application, the ACC process on the application node attempts to translate the application name locally. If a logical name does exist for the application name, then the translation is used to access the application on the application node.

Any name changes that occur on the application node do not affect the submitter's file name. For example, if a logical name on submitter node ARK exists which defines PAYROLL as DOVE::PAYROLL, node ARK asks application node DOVE for application PAYROLL. On node DOVE, ACMS tries to translate the PAYROLL logical again. If the logical translates to NEW_PAYROLL, for instance, the NEW_PAYROLL application is accessed on node DOVE. When files relating to that application are copied to node ARK, they are stored as PAYROLL.

The copying of application database (.ADB) and form files from a remote node to the local node where users are selecting tasks is referred to as **caching**. This is done to increase system performance, by avoiding the need for network access to the application node for application database and form files. A fuller explanation of this process is found in *Section 6.4, "Distributed Operations ACMS Performs Automatically"*.

If an application specification or a translation of a logical application specification does not contain a node name, ACMS looks for the application on the submitter's node. If you do use node names, they cannot contain access control strings. For example, ALPHA"ADAMS JOHNQUINCY"::PAYROLL is not a valid application specification because it includes the access control string, "ADAMS JOHNQUINCY".

ACMS follows OpenVMS conventions when translating logical names. For information about how OpenVMS translates logical names and how it translates logical names interactively, refer to *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/]. See *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/] for more information about ACMS application specifications.

6.3.2. Search Lists and Primitive Failover

If an application moves between nodes, or you want to provide a backup node for an application in the event that a node fails, use search lists. Search lists are used to specify all locations for an application. For example, if the application PAYROLL is installed on node DOVE *and* on node RAVEN, define the logical name PAYROLL to be the following search list:

```
$ DEFINE/SYSTEM PAYROLL DOVE::PAYROLL,RAVEN::PAYROLL
```

The menu definition then specifies PAYROLL as the application name. ACMS searches for the application on each node listed until it locates an available application, or until it reaches the end of the search list. You can define a search list for an application name, a node name, or both.

For example, if the applications ACCOUNTING, PERSONNEL, and BUDGET are all installed on nodes DOVE, ARK, and BRANCH, you can define the logical name APPL_NODE to be the following search list:

```
$ DEFINE/SYSTEM APPL_NODE DOVE::, ARK::, BRANCH::
```

Menu definitions then specify APPL_NODE::ACCOUNTING. When APPL_NODE::ACCOUNTING is translated, the first available application in the search list is used. Therefore, DOVE::ACCOUNTING is used if it is available. If it is not available, ACMS continues to process the search list from left to right until an available application is located.

Search lists provide a primitive form of failover. When an application goes down, an application node goes down, or the link between the submitter node and the application node is severed for some reason, ACMS cancels all active tasks on the submitter node. When a user attempts to select another task in the same application, ACMS reprocesses the search list for an available application.

Once an available node or application is found, all subsequent task selections are redirected to the available application, and terminal users are once again able to select tasks. No group or user workspace context in the failed application is saved. Users receive an error message when this type of failover situation occurs.

If you want to stop an application and cause users to select tasks in an application executing on another node, you can force failover to another application by using the **ACMS/REPROCESS APPLICATION** command. This command is described in the next section.

6.3.3. Redirecting Users to Other Applications at Run Time

ACMS translates logical names for applications only when a task is first selected in an application. Once ACMS on a submitter node locates an application node, all task selections from the submitter node go to

that application node until that application is either stopped or the link between the submitter node and the application node is broken.

However, you can cause ACMS to direct task selections to another application in a search list (or return users to an application that previously failed), by using the **ACMS/REPROCESS APPLICATION** command. The **ACMS/REPROCESS APPLICATION** command causes ACMS to retranslate the search list for a logical name. For example:

```
$ ACMS/REPROCESS APPLICATION PAYROLL
Reprocess Specification for Application PAYROLL (Y/[N]):
```

This command causes ACMS to retranslate the logical name PAYROLL the next time a task submitter selects a task in the application.

The **ACMS/REPROCESS APPLICATION** command is especially useful for system managers who need to install an updated version of an application, but do not want to cause application downtime during this procedure. Simply redirect user task selections to an application executing on another node by using the **ACMS/REPROCESS APPLICATION** command; install the updated version; and then issue another **ACMS/REPROCESS APPLICATION** command to redirect user task selections back to the original node, which is now executing the updated application.

The **ACMS/REPROCESS APPLICATION** command can also be used to switch between versions of an application where the submitters and the application are running on the same system, as illustrated in the following example.

A site has two copies of an application, PAYROLL_A and PAYROLL_B, with the logical name PAYROLL defined as PAYROLL_A, PAYROLL_B. Note that no node names are used. The assumption is that the system is running and the system manager wants to make a new version of the payroll application available without interrupting the company's flow of work.

The system manager copies the new application database file (the .ADB file) to ACMS$DIRECTORY and calls it PAYROLL_B. The order of the PAYROLL logical is then redefined to PAYROLL_B, PAYROLL_A. The **ACMS/REPROCESS APPLICATION PAYROLL** command is then issued, causing all subsequent task selections to go to the new PAYROLL_B application. When there are no more submitters using PAYROLL_A, that application can be stopped. To switch users back to PAYROLL_A after it has been updated, the logical names are reversed, and the process is repeated.

In a distributed ACMS environment, the process goes as follows: If PAYROLL is defined as the search list: DOVE::PAYROLL, ARK::PAYROLL, RAVEN::PAYROLL, and you want to install an updated version of the PAYROLL application on node DOVE (the application currently being used), redefine the search list to point to ARK::PAYROLL, RAVEN::PAYROLL and execute the **ACMS/REPROCESS APPLICATION** command. Terminal users make new task selections in ARK::PAYROLL. After you install the updated application on node DOVE, redefine the search list to point to DOVE::PAYROLL, ARK::PAYROLL, RAVEN::PAYROLL and issue another **ACMS/REPROCESS APPLICATION** command. Users make new task selections in the updated application.

The **ACMS/REPROCESS APPLICATION** command can also be used to cause submitters to "failover" to an application that previously failed but has now been made available. For example, if PAYROLL is defined as the search list: DOVE::PAYROLL, ARK::PAYROLL, RAVEN::PAYROLL, and node DOVE goes down, ACMS automatically retranslates the search list for PAYROLL, and terminal users make new task selections in ARK::PAYROLL. When node DOVE again becomes available, issue the **ACMS/REPROCESS APPLICATION** command to redirect subsequent user task selections back to the DOVE::PAYROLL application.

6.4. Distributed Operations ACMS Performs Automatically

When an **ACMS/START APPLICATION** command is issued, the application execution controller (EXC) checks that all form files referenced by task groups in the application definition exist. The EXC uses the default directory and logical names to locate the form files.

Once all the form files are found, EXC stores the full file specification for each form file. When EXC makes a DECforms I/O request to the agent process, it passes the full file specification to the agent process.

In ACMS, all DECforms requests run in the agent process, whether the task is submitted locally or remotely. Therefore, the agent process must have access to the form files. If a task is selected from a remote agent, the form files must be distributed to the remote node.

All form files used by an application must be on the application node, because the application execution controller (EXC) checks that all files are present when the application starts. The form files must also be accessible to the submitter node, because code running in the task submitting agent on the submitter node issues the calls to DECforms requests. Escape routine files, however, are *not* checked when the application starts.

Note

ACMS uses the translation of the SYS$NODE system logical name from an application node to form the directory specification when caching DECforms form files and TDMS request library files. DECnet defines the logical name when it is started. Do not change the definition of this system-defined logical name. If this logical name is changed, then the ACMS caching routines do not function correctly and place files in directories with incorrect names. If this happens, ACMS cannot open the necessary form or request library files and, as a result, cancels tasks.

6.4.1. Automatic File Distribution

When a user selects a task in an application, the ACMS run-time system checks to see if the application and form files are accessible on shared disks available to both the submitter and the application nodes. If the files are not located on shared disks and are not already resident on the submitter node, ACMS automatically copies the application and forms files used by the application from the application node to the submitter node. ACMS does not automatically distribute DECforms escape routines. You must distribute these files manually. See *Section 6.5.1, "Manually Distributing Applications"* and *Section 6.6, "Managing and Caching DECforms Escape Routine Files"* for information on how to manually copy DECforms escape routines and where to store them.

These copies are made automatically by ACMS to increase the performance of the system by avoiding having to access these form and application files over a network.

For ACMS to perform this automatic distribution of application and form files, the ACC and the CP must have access to these files. On the application node, you can use proxies for the remote ACC and CP in combination to allow access to these files by the ACC and CP on the submitter node. Alternatively, assigning the files WORLD:RE protection ensures that these files are accessible.

Using proxies allows a submitter node ACC or CP to access the files on the application node as if they were being accessed by the application node's ACC or CP. In this case, the files do not need

WORLD:RE access. However, if proxies are not used, the submitter node's ACC and CP are accessing the files as if they were nonprivileged users on the application node, which is why the files must have WORLD:RE protection. If this no-proxy method is used, the application node must have set up a default DECnet account which does not have privileges, but does allow remote nodes to access files which have WORLD:RE protection on the local node. For ACMS caching to work without the use of proxies, this DECnet default account must exist.

6.4.2. ACMS Systemwide Cache Directory

When ACMS automatically distributes files to the submitter node, it places the files in a special directory hierarchy created by ACMS specially for this purpose. This directory structure is known as the ACMS systemwide cache directory. By default, on the submitter node, ACMS creates this systemwide cache directory structure by using the translated directory specification of ACMS$DIRECTORY with ACMS$CACHE appended as a rooted directory. For example, if ACMS$DIRECTORY translates to DRA1:[ACMSDIR], then the systemwide cache directory on submitter node DOVE is DOVE::DRA1:[ACMSDIR.ACMS$CACHE].

To create and reference files in the systemwide cache directory hierarchy, ACMS uses three logical names:

- ACMS$ADB_CACHE
- ACMS$RLB_CACHE
- ACMS$FORMS_CACHE

ACMS defines these logical names as rooted directories. For example, consider a system where the ACMS$DIRECTORY logical is defined to be SYS$SYSDEVICE:[ACMSDIR]. If the physical system disk device name is 1DUA0:, then ACMS defines ACMS$ADB_CACHE as 1DUA0:[ACMSDIR.ACMS$CACHE.]. Note that a physical device name must be used when defining a rooted directory logical name.

ACMS creates subdirectories (on the submitter node) for each node to which it copies application databases. Each node needs its own subdirectory in case two nodes have different applications with the same name. ACMS does not create subdirectories if the databases are accessed remotely. The location of these subdirectories is controlled by cache logicals, described in the preceding paragraphs. These subdirectories are used to store the .ADB and form files for applications access on that remote node.

For example, assume that the following nodes are running these applications:

- NODE COMET

```
Application AVERTZ    using DRA1:[TWEETY]INVENTORY.FORM
                      and   DRA1:[TWEETY]INVENTORY.EXE

Application PAYROLL   using DRA1:[HECKLE]PAYROLL.RLB
                      and   DRA1:[HECKLE]GENERAL.RLB
                      and   DRA1:[HECKLE]PAYROLL_REQ.RLB

Application STOCK     using DRA1:[JECKLE]GENERAL.RLB
                      and   DRA1:[JECKLE]STOCK.RLB
```

- NODE STAR

```
Application PAYROLL   using DRA1:[TWEETY]PAYROLL.RLB
```

```
Application AVERTZ    using DRA1:[TWEETY]GENERAL.FORM
                      and   DRA1:[TWEETY]GENERAL.EXE
```

Once a terminal user on submitter node COMET has selected tasks in each of these applications, the ACMS$CACHE directory on node COMET contains the subdirectories for the applications on each remote node.

Referred to under node COMET is PAYROLL.ADB, PAYROLL.DIR, STOCK.ADB, and STOCK.DIR. Referred to under node STAR is PAYROLL.ADB and PAYROLL.DIR. In this way, the ACMS system can discriminate among applications with the same name running on different nodes.

Also note that each subdirectory contains an .ADB and a .DIR for each application. Each .DIR contains the application's request libraries (.RLB) and/or forms files (.FORM and .EXE).

In most cases, the file name and type of the request libraries and forms files are the same as the file name and type on the remote node. If a remote application uses two different files with the same file name and type, but the files reside in a different disk or a different directory, the file type is modified to include the index of the task group within the application and of the request libraries and/or forms files of the task group.

This information can be obtained from the ADU **DUMP APPLICATION** and **DUMP GROUP** commands. The file type is modified to be .file-type_g_r, where file-type is the original file type, "g " is the index of the task group (leading zeros suppressed) as recorded in the .ADB and "r " is the index of the request library of forms file (leading zeros suppressed) as recorded in the .TDB.

Given that there are two file specifications with the same file name and type, the second file by alphabetical order of the full file specification will have the file type modified. For example, you have this definition in the task group:

```
FORMS ARE
   form_a IN "DISK1$:[USER1]FORM_X.FORM" WITH NAME F1,
   form_b IN "DISK2$:[USER2]FORM_X.FORM" WITH NAME F2;
```

The first file will retain the file name and type. The second file will have FORM_X.FORM_1_2 as the file type. The same rule applies to request libraries (.RLB) and forms image files (.EXE). However, you should not use the same file name for forms image files (.EXE) because of the restrictions of the OpenVMS image activator. For details about forms image files, see *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/].

When files are updated on the application node, ACMS automatically copies the new version of each file to the submitter node and deletes the old version the next time a user on a submitter node selects a task in an application containing updated files.

Note that ACMS does *not* make the copy at the time the change is made on the application node. The copy is made only when a user on the submitter node selects a task in the updated application. When updating application and form files, ACMS maintains a single copy of each file. It deletes old versions as soon as it makes an updated copy. Once the files are updated, the copies remain on each node until they are superseded by new versions or until they are explicitly deleted.

When a terminal user selects a task, ACMS processes the search list in an application specification from the first specification on the left to subsequent specifications, using the following sequence of actions:

- The Command Process (CP) sends a message to the ACMS Central Controller (ACC) to get information about the application.

- The ACC looks at the application specification and attempts to translate it as a logical name.
- The ACC then finds out if the application is running on the first, and possibly only, node named in the application specification. If it is, ACC uses that application.
- If the node is not reachable, or the application is not running, ACC looks at the next node in the application specification. If there are no more entries in the search list, or the logical name is not a search list, or the application specification contains a single hard-coded node name, then the task selection fails.
- If a usable application is found, however, ACMS then looks for an application database file (.ADB file) in the following manner:
    - First, ACMS translates the ACMS$ADB_CACHE logical and looks in the first directory specified in the search list (assuming that the logical translates to a search list).
    - If an up-to-date version of the .ADB is found, the task then executes.
    - If the .ADB is out-of-date, ACMS tries to update it. If this is impossible, perhaps because the directory is write-protected, then ACMS proceeds to the next translation of the ACMS$ADB_CACHE logical name.
    - If, in the process described in the preceding paragraphs, a translation is found that equals "NET", then ACMS uses DECnet to access the .ADB file.
    - If ACMS reaches the end of the search list and has not found a directory that contains the .ADB file, or found an obsolete file and could not update it, then ACMS starts at the beginning of the search list and tries to copy the .ADB file into each directory on the list.
    - As soon as ACMS finds a directory to which it can copy the .ADB file, it does so, and the task then executes.
    - However, if the end of the search list is reached and ACMS finds that all the directories are write-protected, or perhaps the disk is full or there is no disk quota left, then the task selection fails.

Note that during the preceding sequence of events, ACMS does not attempt to look for another application using the application specification, because a running application has already been found and it is the cache problem that has caused the task cancellation.

Periodically, you may want to delete little-used files in the system cache directory. This could involve rarely used applications or nodes. This ensures that databases and forms that are infrequently used do not consume disk space. However, deleting files in the cache directory can cause slow response time for the first task selected in a remote application while ACMS copies the application and forms files to the submitter node.

On nodes with large disks, you can allow ACMS to automatically distribute all application database and forms files for all applications accessed by terminal users. On nodes with limited disk space, you may want to manually copy the forms and application files most frequently used and use access over the network for other, less frequently used, applications.

However, remember that performance may be affected when one of these less frequently used applications is selected, due to the need for network access to the form and application database files. The following section describes how to determine whether the manual distribution of application and forms files is advantageous for your particular site.

6.5. Tailoring ACMS Distributed Forms Processing to Your Site

You may be a system manager on a submitter node that has limited disk space, and want to avoid allocating the space needed for the automatic distribution of application and forms files. If this is the case, you can perform the following operations:

- Manually copy the application and forms files for the applications you use most often to the cache directory on the submitter node.
- Cause ACMS to search a local cache directory before it searches the systemwide cache directory by redefining cache logical names.
- Allow remote access to application files that are infrequently used.

These methods are described in the following sections.

6.5.1. Manually Distributing Applications

To copy application and forms files when manually populating the system cache directory on a submitter node, you must know the remote file specifications of the application and forms files, and the application names that the files belong to. Assuming you have the needed file specifications and application names, you then take the following steps:

- Copy .ADB files to ACMS$ADB_CACHE:[node]*

  You must use a wildcard file name to preserve the creation date. If the local application name is different from the remote name, you must rename the file.

- Copy TDMS .RLB files to ACMS$RLB_CACHE:[node.application]*

  You must use a wildcard file name to preserve the creation date. If the local application name is different from the remote name, you must rename the file. If an index must be attached to the file type, use the **RENAME** command.

- Copy DECforms .FORM and .EXE files to ACMS$FORMS_CACHE :[node.application]*

- Copy DECforms .FORM and .EXE files to ACMS$FORMS_CACHE:[node.application]*

  You must use a wildcard file name to preserve the creation date. If the local application name is different from the remote name, you must rename the file. If an index must be attached to the file type, use the **RENAME** command. ACMS does not perform automatic installation of image form files. If you want to make shared image format a known shareable image, you must issue the **INSTALL** command manually.

  You must also manually distribute escape routine files that are not part of a shareable image. An escape routine can do anything that is allowed in the environment in which it runs; it can, for example, call routines in shared images, use logicals, and use global sections. Because it has no way of knowing what parts of the environment must be duplicated on a remote node, ACMS cannot automatically distribute escape routine files. See *Section 6.6, "Managing and Caching DECforms Escape Routine Files"* for a description of managing DECforms escape routines.

ACMS carefully preserves the original creation date and time on the local copy when it distributes files. You are responsible for this information if you manually distribute application and forms files. If you

copy the files over the network using the OpenVMS **COPY** command, and specify the wildcard output file name and type, the COPY operation maintains the original creation date and time of the file.

If the destination application or forms file names differ from the source file names, you must still use the wildcard output file name and type when you copy the files. You can then use the OpenVMS **RENAME** command to add the necessary index to the file type of these files or to use the fully translated local application name as the file name of .ADB files. The **RENAME** command maintains the original creation date and time.

Destination application and forms file names can be different from the source names when an application uses two or more different application or forms files with the same file name and type, or when the local application name differs from the remote application name. If an application node has an application that uses two different forms files with the same file name and file type, there must be some way to distinguish them. This is done by modifying the file type.

For example, if application PAYROLL has two different files both called GENERAL.FORM, the file type is modified to include the index of the task group within the application and the index of the .FORM within the task group. The file index is obtained from the ADU **DUMP APPLICATION** and **DUMP GROUP** commands.

For example, the file type is modified to be .FORM_g_r, where *g* is the index of the task group (leading zeros suppressed) as recorded in the .ADB, and *r* is the index of the form file (leading zeros suppressed) as recorded in the .TDB. This method of indexing file types is the same for both DECforms and TDMS forms files.

ACMS automatically updates distributed files whenever they become outdated, however, you can prevent ACMS from automatically updating files by write-protecting the directories in which the files reside. ACMS does not update DECforms escape routines or their resources.

6.5.2. Creating Agent-Specific Cache Directories

An agent must have write access to the cache directory to update it. However, you usually do not want nonprivileged agents to update the cache directory. ACMS defines a nonprivileged agent as one that is not authorized as an agent with the User Definition Utility (UDU), and therefore cannot submit tasks for other users. Examples of nonprivileged agents are:

- ALL-IN-1
- Customer-written agents running the debugger
- Customer-written agents being executed directly by terminal users

An agent image can be installed with privileges; however, do not assign privileges to an agent haphazardly, since an agent process executes under the terminal user's OpenVMS user name. Theoretically, the user whose name the agent process is running under could cause problems by adding an incorrect file to the system cache, thereby denying service to another user. For example, if you made ALL-IN-1 a privileged agent, ALL-IN-1 users would then be able to access the system cache directory with ALL-IN-1 commands. This could corrupt the system cache directory and its files, or cause other unexpected results.

You can avoid giving nonprivileged agents access to the system cache by creating an agent-specific cache directory. The agent-specific cache directory could be shared between agents (for example, all ALL-IN-1 users), or could be separate for each agent (for example, customer-written agents running the debugger).

Create the agent-specific cache directory in SYS$DISK. Then, define the logical name ACMS$RLB_CACHE or ACMS$FORMS_CACHE to point to either the agent-specific cache directory or a search list of directories.

The logical name can point to a local, agent-specific cache, and then to a central cache to which the agent does not have write access. For example:

```
$ DEFINE/EXEC ACMS$FORMS_CACHE -
_$ DRB2:[ALLIN1_CACHE.],DRA1:[ACMSDIR.ACMS$CACHE.]
```

Here, ACMS searches the private cache [ALLIN1_CACHE] for the DECforms file. If ACMS does not find the file there, it searches the public cache [ACMSDIR.ACMS$CACHE.]. If ACMS still does not locate the file, it creates a new version in the local cache.

The logical name ACMS$ADB_CACHE, which is normally a system logical name, must be available to the ACC. The ACMS$RLB_CACHE and ACMS$FORMS_CACHE logical names, however, can be defined as system, group, job, or user logical names, provided the logical name can be translated by the agent. They are usually defined as system logical names.

The ACMS remote request code in the agent process can only allow an agent to update a cache to which it has write access. If ACMS finds an out-of-date file in the central cache, it updates the file in the agent-specific cache.

If you are supporting multiple caches by using search lists, control where application and forms files are placed the first time they are copied from the application node. This is controlled through the use of a write-protected directory in the search list.

6.5.3. Accessing Remote Application Files

You can allow remote access for infrequently used application and forms files by adding the characters "NET:" to the end of your search list. For example, if you want to allow remote access to all DECforms files that are not found locally in DRA1:[ACMSDIR.ACMS$CACHE.], you define the ACMS$FORMS_CACHE logical as follows:

```
$ DEFINE ACMS$FORMS_CACHE DRA1:[ACMSDIR.ACMS$CACHE.],NET:
```

The "NET:" designation tells the ACMS run-time system that if the application or forms file is not found in the local ACMS$CACHE directory, it must open the application or forms file using remote DECnet file access. This requires that there be a process on the application node for each agent for each application and forms file. ACMS reads the .ADB files once and then keeps them in memory. See *Section 6.4, "Distributed Operations ACMS Performs Automatically"* for information on how ACMS updates remote application and forms files.

6.6. Managing and Caching DECforms Escape Routine Files

With DECforms, application program subroutines can be called during the processing of an external request. These subroutines, called escape routines, are executed in the context of the agent process. Because of this, application and system managers must consider the following:

- Making escape routines available to the CP agent
- Protecting privileged agents that execute escape routines

- Caching escape routines in a distributed environment

Caution

Many agents, including the ACMS-supplied CP agent, perform work on behalf of multiple users. These agents are *multithreaded* or *asynchronous*. However, DECforms escape routines provide only a **synchronous** interface. When you use an escape routine in a multithreaded agent, be careful not to do anything that might delay the CP agent in processing other users' requests. For example, do not use an escape routine to perform terminal or disk I/O, because this stalls other users.

6.6.1. Making Escape Routines Available to the CP Agent

The two methods for making escape routines available to the CP agent are: link them with the form image, or link them in a separate image. There are advantages and disadvantages to each method, as follows:

- Linking escape routines with the form image

  You can make escape routines available to the CP agent by linking them into the same image as the form. An advantage to this method in a distributed processing environment is that the escape routines are automatically cached, with the forms files, to the remote submitter node.

  By using this method, however, you allow application code from a remote system to execute in a privileged environment on your system. But if the remote application node and the local submitter node are in a common security domain, this may not be a concern.

  To avoid the possible security problem of executing escape routines that are linked with the forms shareable image, ACMS, by default, does not execute these escape routines. To execute them, you must define the following system-level logical:

  ```
  ACMS$ESC_RTN_IN_FORM
  ```

  If the value of this logical is set to "T", "t", "Y", "y", or "1", then ACMS allows these escape routines to run. If this logical is not defined or has another value, ACMS does not execute the escape routines.

- Linking escape routines in a separate image

  You can also link escape routines in their own shareable image. You then need to make that image available to the CP agent by defining this logical:

  ```
  FORMS$IMAGE
  ```

  If you have more than one escape routine image, you can make the logical a search list of all images. For the ACMS-supplied CP agent, this logical must be in either the system group name table or the system name table. Refer to DECforms documentation for more information about defining this logical.

  If you use the FORMS$IMAGE logical to specify escape routine images, these escape routines can be shared by all of the applications that the CP agent references. However, sometimes the different applications may have the same escape routine name for different functions. To settle this possible naming conflict, ACMS provides an additional logical:

  ```
  ACMS$ESC_RTN_<node>_<application>
  ```

You can use this logical to define an escape routine image for a particular application on a particular node. If the application uses more than one image, this logical can be a search list. When you use this logical name on a system where the NODE_NAME parameter is not defined in ACMSGEN, you must omit the <node> part from the logical name. Therefore, the logical name looks like:

```
ACMS$ESC_RTN_<application>
```

If you do not define this logical, or the specified logical is not on the search list, DECforms then uses the FORMS$IMAGE logical.

6.6.2. Privileged Agents that Execute Escape Routines

Certain agents, such as the ACMS-supplied CP agent, run in a privileged environment. Any escape routines that execute in a privileged agent also execute in the same privileged environment. Be sure to develop escape routines to execute in a privileged agent in the same way as you develop any other privileged code. Carefully review the code for any possible security violations before you run it live on the system.

Place the escape routine images in a write-protected directory; also write-protect the images themselves. After you place the file in a protected directory, you can define the logicals that make the escape routines available to the agent process.

You may not, however, need to place escape routines executed by a nonprivileged agent in a protected directory. In some cases, such as debugging, you may want the person running the CP agent to be able to change the escape routines executed. Use the methods described previously to make the escape routine images available to the CP agent.

Chapter 7. Using Data Compression

This chapter describes the data compression feature that can improve system response time and reduce the cost of transmitting data across networks.

For information on designing ACMS applications, refer to *VSI ACMS for OpenVMS Concepts and Design Guidelines* [https://docs.vmssoftware.com/vsi-acms-concepts-and-design-guide/].

7.1. Overview of Data Compression

This section provides an overview of data compression, by describing the purpose of data compression and how this feature works.

7.1.1. Purpose of Data Compression

In wide area networks, data must often be transmitted over relatively slow links. Also, many public networks charge for each packet of data transmitted over the network. In these situations, compressing the data before sending it over the link can accomplish one or both of the following:

- Provide a faster response time for the user

  Providing high-speed links is often far too costly in an application with a widely distributed user base and relatively few users at each of many different sites. As an alternative to providing high-speed links, data compression can reduce the size of network messages, thereby reducing the time taken for the messages to be transmitted over the network. Thus, data compression can result in an improvement in the response time of an application for a user on a distributed front-end system.

- Reduce the cost of using the system

  Many public networks, such as various X.25 packet-switching networks, charge for data sent over the network from one node to another. Clearly, you can realize a cost savings by transmitting less data over the network while still providing the same service to users of applications on that network.

7.1.2. How ACMS Uses Data Compression

You can enable data compression selectively between systems in a network. You might, for example, have a mixed configuration that has both wide area and local area networks. If both the submitter and application nodes exist on the same local area network, the cost of compressing data far outweighs the cost of transmitting uncompressed data over the network.

You can control data compression on a per-process basis. For example, data compression might be beneficial if you enable it for a forms-based agent such as the Command Process (CP). On the other hand, data compression might not be appropriate for a specialized user-written agent, if that agent processes data that is not compressible using the ACMS data compression algorithm.

ACMS provides system management tools that allow you to control the use of the data compression. One mechanism enables you to verify that data compression is enabled and used correctly. Another mechanism allows you to monitor the efficiency of the data compression algorithm in terms of the amount of data compression that is achieved.

ACMS compresses the following types of workspace data:

- Data in task argument workspaces that an agent sends to and receives from a task
- Data in send and receive workspaces, send and receive shadow workspaces, and send and receive control text workspaces passed to DECforms forms
- Data in workspaces passed to TDMS requests
- Data in workspaces read or written using stream I/O

ACMS does not compress other data such as DECforms send and receive record names or TDMS request names.

7.1.3. How Data Compression Works

The amount that data can be compressed must be offset against the cost involved in compressing the data before it is sent over the network, and decompressing the data after it has been received. The cost is measured by CPU and memory usage.

To implement data compression, ACMS uses a simple run-length encoding algorithm that aims to provide a reasonable data compression ratio in typical applications, while not consuming excessive CPU or memory resources. In most cases, a higher compression ratio provides better performance in terms of less CPU usage and improved response time. See *Table 15.2, "ACMS Data Items"* for more information about the compression ratio.

Due to the overhead of the information necessary to describe the compressed data, compressed data sometimes occupies the same or more space than its original uncompressed form. In this situation, ACMS uses the uncompressed form when constructing a message to transmit over a network. However, when data compression is enabled, ACMS always sends less data, even if the workspaces data cannot be compressed; at the very least, the message overhead is optimized for space rather than for speed of processing.

In general, applications benefit most when using data compression under the following conditions:

- When minimal data is passed in large workspaces. In this case, the workspace should be space filled or zero filled.
- When large workspaces are sent over relatively low speed links.
- When the data in the workspaces contain long strings of consecutively identical bytes.

7.2. How to Use Data Compression

The following sections describe:

- Managing data compression by defining the logical names ACMS$ENABLE_DATA_COMPRESSION and ACMS$AUDIT_NETWORK_CONNECTIONS for processes on application and submitter nodes
- Enabling data compression in either the restricted or unrestricted mode
- Disabling data compression
- Enabling logging of data compression

- Disabling logging of data compression

Note

You must upgrade both the submitter and the application nodes to ACMS Version 3.3 or higher before you can use data compression for data in workspaces used in exchange steps.

Also, to use data compression for data in task argument workspaces that agents supply, you must rebuild any application database (ADB) files after you install ACMS.

7.2.1. Rules for Defining Logical Names

ACMS uses two logicals to manage data compression:

- ACMS$ENABLE_DATA_COMPRESSION
- ACMS$AUDIT_NETWORK_CONNECTIONS

You must define both the ACMS$ENABLE_DATA_COMPRESSION and ACMS$AUDIT_NETWORK_CONNECTIONS logical names as executive mode system logical names or as process logical names.

In an agent process, ACMS translates the logical names when the first submitter signs in. Therefore, for an ACMS-supplied CP agent, define the logical names as system logicals in executive mode before you start the ACMS terminal subsystem. For a user-written agent, you must either define the logical names before the agent program is started, or the agent program itself must define the logical names before calling ACMS$SIGN_IN to sign in the first submitter.

In the Application Execution Controller (EXC) process, ACMS translates the logical names as part of the application startup processing. Therefore, you either must define the logical names as system logicals in executive mode before you start the application, or you must define them using the APPLICATION LOGICAL NAME clause in the application definition.

If you need to enable or disable data compression or the auditing of network connections after an agent process or an application process has been started, you must restart the process after you define, redefine, or deassign the appropriate logical names.

7.2.2. Using Restricted and Unrestricted Modes

You can enable data compression in one of two modes:

- Unrestricted mode

  In unrestricted mode, ACMS uses data compression on all network connections to remote nodes that also have data compression enabled.

- Restricted mode

  In restricted mode, ACMS uses data compression only on network connections to a specified set of remote nodes.

ACMS never uses data compression automatically. You must always explicitly enable data compression on both the application node and the submitter node before ACMS uses data compression between the two nodes. ACMS never uses data compression for communications between processes on the same node.

7.2.2.1. Enabling Data Compression in Unrestricted Mode

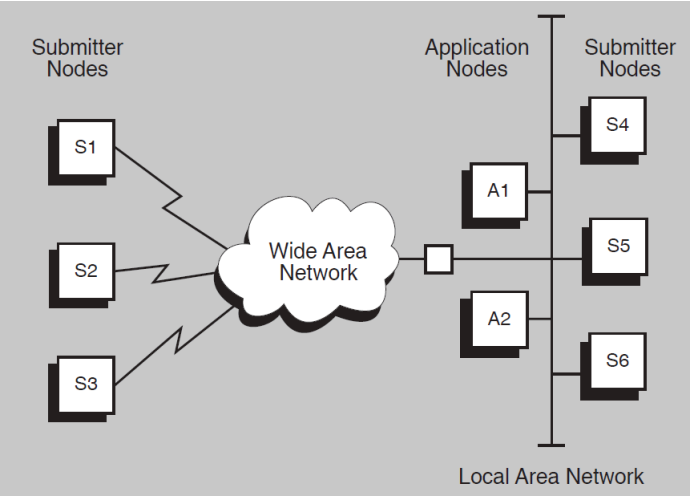
To enable data compression in unrestricted mode, define the ACMS$ENABLE_DATA_COMPRESSION logical name as the wildcard asterisk character (*).

For example, use the following command to enable data compression in unrestricted mode:

```
$ DEFINE/SYSTEM/EXECUTIVE   ACMS$ENABLE_DATA_COMPRESSION *
$ DEFINE/SYSTEM/EXECUTIVE ACMS$ENABLE_DATA_COMPRESSION *
```

Figure 7.1, "Simple Mixed-Interconnect Network" illustrates a distributed configuration consisting of three submitter nodes, each connected by a wide area network to a local area network consisting of two application nodes and three more submitter nodes.

Figure 7.1. Simple Mixed-Interconnect Network



In the configuration in *Figure 7.1, "Simple Mixed-Interconnect Network"*, data compression is required between submitter nodes S1, S2, and S3 and application nodes A1 and A2, because the submitter and application nodes are separated by a wide area network. Data compression is not required between submitter nodes S4, S5, and S6 and application nodes A1 and A2, because the submitter and application nodes are on the same local area network.

To use data compression in this configuration, enable data compression in unrestricted mode on submitter nodes S1, S2, and S3 and on application nodes A1 and A2, using the following command:

```
$ DEFINE/SYSTEM/EXECUTIVE   ACMS$ENABLE_DATA_COMPRESSION *
$ DEFINE/SYSTEM/EXECUTIVE ACMS$ENABLE_DATA_COMPRESSION *
```

Because data compression is not enabled on nodes S4, S5, and S6,data compression is not used between these nodes and application nodes A1 and A2.

7.2.2.2. Enabling Data Compression in Restricted Mode

You might sometimes want to limit the use of data compression to network connections between specific nodes in a network. To enable data compression in restricted mode, define the ACMS$ENABLE_DATA_COMPRESSION logical name as a search list, with each node name separated by a comma. You can specify node names with or without the trailing double-colon (::).

In restricted mode, ACMS uses data compression only for network nodes defined in the ACMS$ENABLE_DATA_COMPRESSION logical name. You do not need to enable data

compression in restricted mode on both nodes. For example, you can enable data compression on a submitter node in unrestricted mode, and enable data compression on an application node in restricted mode. To do this, include the name of the submitter node in the list of nodes that the ACMS$ENABLE_DATA_COMPRESSION logical name identifies.

For example, use the following command to enable data compression in restricted mode from the application node to nodes S1 and S2:

```
$ DEFINE/SYSTEM/EXECUTIVE ACMS$ENABLE_DATA_COMPRESSION S1,S2
```

On nodes S1 and S2, define the logical name in unrestricted mode:

```
$ DEFINE/SYSTEM/EXECUTIVE ACMS$ENABLE_DATA_COMPRESSION *
```

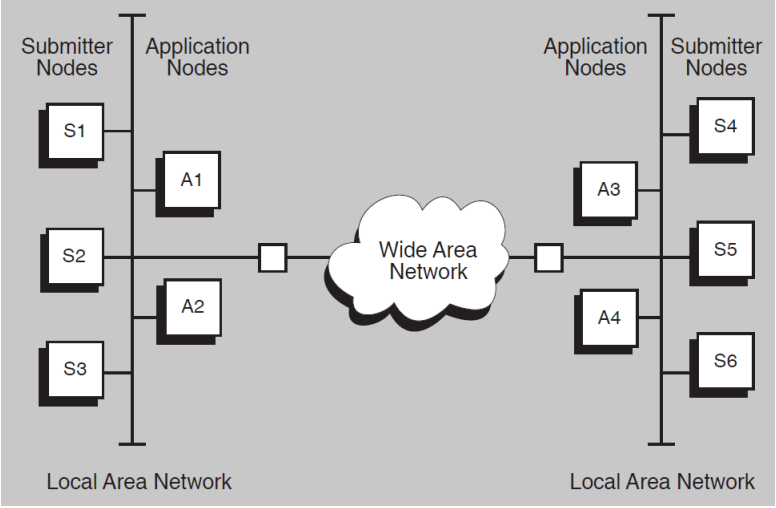
Note

In listing node names as the equivalence names in the search list when you define the ACMS$ENABLE_DATA_COMPRESSION logical name, do not specify the unrestricted mode (*) symbol as a node name. If you use the unrestricted mode (*) symbol in place of a node name in the search list, ACMS writes an error entry to the ACMS audit log and does not enable data compression.

Figure 7.2, "Complex Mixed-Interconnect Network" extends the example shown in *Figure 7.1, "Simple Mixed-Interconnect Network"* by adding a second local area network containing two application nodes in addition to three submitter nodes. In the example, users on any submitter node can select tasks on any of the application nodes.

In the configuration shown in *Figure 7.2, "Complex Mixed-Interconnect Network"*, data compression is required between submitter nodes S1, S2, and S3 and application nodes A3 and A4, and between submitter nodes S4, S5, and S6 and application nodes A1 and A2. Data compression is not required between any other nodes in this network.

Figure 7.2. Complex Mixed-Interconnect Network



To use data compression in this configuration, enable data compression in unrestricted mode on the application nodes. On the submitter nodes, enable data compression so that it is used only when communicating with application nodes over the wide area network. Follow these steps:

1. Enable data compression in unrestricted mode on all the application nodes (A1, A2, A3, and A4) as follows:

```
$ DEFINE/SYSTEM/EXECUTIVE   ACMS$ENABLE_DATA_COMPRESSION *
```

2. Enable data compression in restricted mode on submitter nodes S1, S2, and S3 as follows:

```
$ DEFINE/SYSTEM/EXECUTIVE ACMS$ENABLE_DATA_COMPRESSION A3, A4
```

3. On submitter nodes S4, S5, and S6, enable data compression in restricted mode as follows:

```
$ DEFINE/SYSTEM/EXECUTIVE ACMS$ENABLE_DATA_COMPRESSION A1, A2
```

An alternative approach in this example is to enable data compression in unrestricted mode on all the submitter nodes and then enable data compression in restricted mode on each application node. Follow these steps:

1. Enable data compression in unrestricted mode on all the submitter nodes (S1, S2, S3, S4, S5, and S6):

```
$ DEFINE/SYSTEM/EXECUTIVE ACMS$ENABLE_DATA_COMPRESSION *
```

2. Enable data compression in restricted mode on application nodes A1 and A2:

```
$ DEFINE/SYSTEM/EXECUTIVE ACMS$ENABLE_DATA_COMPRESSION S4,S5,S6
```

3. Enable data compression in restricted mode on application nodes A3 and A4:

```
$ DEFINE/SYSTEM/EXECUTIVE ACMS$ENABLE_DATA_COMPRESSION S1,S2,S3
```

7.2.3. Disabling Data Compression

You might sometimes want to enable data compression on a general, system-wide basis, but disable it for specific processes. For example, you might want to disable it for a specialized user-written agent, if that agent processes data that cannot be compressed using the ACMS data compression algorithm.

To explicitly disable data compression, define the ACMS$ENABLE_DATA_COMPRESSION logical name as a hyphen character enclosed in quotation marks ("-"). For example, use the following command to disable data compression for a specific process:

```
$ DEFINE/PROCESS ACMS$ENABLE_DATA_COMPRESSION "-"
```

Note

DCL uses the hyphen character (-) to indicate the continuation of a DCL command line; therefore, you must enclose the character in quotation marks to differentiate it.

Do not specify the disable symbol ("-") as a node name when you list node names as the equivalence names in the search list when you define the ACMS$ENABLE_DATA_COMPRESSION logical name. If you use the disable symbol ("-") in place of a node name in the search list, ACMS writes an error entry to the ACMS audit log and does not enable data compression.

7.2.4. Enabling Logging of Data Compression

To verify that data compression is enabled correctly, enable logging of ACMS network connection information. When you do this, ACMS writes an entry to the ACMS audit log every time a new ACMS process is started and every time a process initiates or accepts a new network connection.

You can enable auditing on a submitter node, an application node, or both. You can then use the information written to the audit log to determine if ACMS is using data compression correctly on network connections to the appropriate remote nodes.

ACMS uses the ACMS$AUDIT_NETWORK_CONNECTIONS logical name to enable logging of ACMS network connection information. You must define the ACMS$AUDIT_NETWORK_CONNECTIONS logical name as an executive-mode system logical name or as a process logical name in any mode.

To log ACMS network connection information, define the ACMS$AUDIT_NETWORK_CONNECTIONS logical name as a string beginning with T or t (true) or, Y or y (yes), or define it as a success status (an odd number). For example, use the following command to log network connection information for all processes on a node:

```
$ DEFINE/SYSTEM/EXECUTIVE ACMS$AUDIT_NETWORK_CONNECTIONS Y
```

7.2.4.1. Entries Written to the Audit Log When a New Process Is Started

When verification of network connection information is enabled, ACMS writes an entry to the audit log whenever a new process is started. The following examples illustrate each type of entry.

Example 7.1, "Data Compression Is Not Enabled" illustrates the format of the entry ACMS logs when a process is started and data compression has not been enabled.

Example 7.1. Data Compression Is Not Enabled

```
*********************************************************
Type   : OTHER     Time   : 31-Jul-1992 15:20:01.15
Text   : Process ACMS01EXC001000 started
Data compression is not enabled
*********************************************************
```

Example 7.2, "Data Compression Is Disabled" illustrates the entry ACMS logs when a process is started and data compression has been explicitly disabled.

Example 7.2. Data Compression Is Disabled

```
*********************************************************
Type   : OTHER     Time   : 31-Jul-1992 15:21:02.16
Text   : Process ACMS01EXC002000 started
Data compression is explicitly disabled
*********************************************************
```

Example 7.3, "Data Compression Is Enabled in Unrestricted Mode" illustrates the entry ACMS logs when a process is started and data compression has been enabled in unrestricted mode.

Example 7.3. Data Compression Is Enabled in Unrestricted Mode

```
*********************************************************
Type   : OTHER     Time   : 31-Jul-1992 15:22:03.17
Text   : Process ACMS01EXC003000 started
Data compression is enabled for all nodes
*********************************************************
```

Example 7.4, "Data Compression Is Enabled in Restricted Mode" illustrates the entry ACMS logs when a process is started and data compression has been enabled in restricted mode.

Example 7.4. Data Compression Is Enabled in Restricted Mode

```
*********************************************************
Type   : OTHER     Time   : 31-Jul-1992 15:23:04.18
Text   : Process ACMS01EXC004000 started
Data compression is enabled for node: SUB1, SUB2, SUB3
*********************************************************
```

7.2.4.2. Entries Written to the Audit Log When Network Connection Is Established

When logging network connection information to the ACMS audit log, ACMS writes an entry to the log every time a new ACMS network connection is established. Note that ACMS multiplexes ACMS network connections over a single DECnet logical link. This means that you might see multiple entries in the audit log for the same process. The following examples illustrate the format of each type of network connection entry written to the ACMS audit log.

Example 7.5, "Data Compression Is Not Enabled at Local Node" illustrates that a process initiated a network connection but data compression was not used, because it was not enabled for the process at the local node. Note that if data compression is not enabled at the node initiating the network connection, then information about whether data compression is enabled at the remote node is not available.

Example 7.5. Data Compression Is Not Enabled at Local Node

```
*********************************************************
Type   : OTHER     Time   : 31-Jul-1992 15:40:21.45
Text   : Process ACMS01CP001000 initiated network connection
to remote node APPL1
Data compression is disabled (not enabled at local node)
*********************************************************
```

Example 7.6, "Data Compression Is Not Fully Enabled" illustrates that a process initiated a network connection, but data compression was not fully enabled, because the actual application database (ADB) file was built using a version of ACMS prior to Version 3.3. In this case, although a compressed data protocol is used, data in task argument workspaces is not compressed. To fully enable data compression, rebuild the application database (ADB) file using ACMS Version 3.3 or higher.

Example 7.6. Data Compression Is Not Fully Enabled

```
*********************************************************
Type   : OTHER     Time   : 31-Jul-1992 15:41:14.32
Text   : Process ACMS01QTI001000 initiated network connection
to remote node APPL2
Data compression not fully enabled (not enabled in ADB, please rebuild)
*********************************************************
```

Example 7.7, "Data Compression Is Not Enabled at the Remote Node Initiating the Network Connection" illustrates that a network connection was accepted by a process on the local node. Data compression was not used, however, because it was not enabled for the process at the remote node that initiated the connection.

Example 7.7. Data Compression Is Not Enabled at the Remote Node Initiating the Network Connection

```
*********************************************************
```

```
Type   : OTHER     Time   : 31-Jul-1992 15:42:23.76
Text   : Process ACMS01EXC001000 accepted network connection
from remote node SUB1
Data compression is disabled (not enabled at remote node)
************************************************************
```

Example 7.8, "Data Compression Is Enabled at the Remote Node, But Is Not Enabled at the Local Node" illustrates that a network connection was accepted by a process on the local node. However, data compression was not used, because, although it is enabled at the remote node that initiated the connection, it is not enabled for the process at the local node.

Example 7.8. Data Compression Is Enabled at the Remote Node, But Is Not Enabled at the Local Node

```
************************************************************
Type   : OTHER     Time   : 31-Jul-1992 15:43:28.54
Text   : Process ACMS01EXC002000 accepted network connection
from remote node SUB2
Data compression is disabled (not enabled at local node)
************************************************************
```

Example 7.9, "Data Compression Is Enabled with Network Connection to the Remote Node" and *Example 7.10, "Data Compression Is Enabled with Network Connection from the Remote Node"* illustrate network connections that were established with data compression enabled.

Example 7.9. Data Compression Is Enabled with Network Connection to the Remote Node

```
************************************************************
Type   : OTHER     Time   : 31-Jul-1992 15:50:42.50
Text   : Process ACMS01CP001000 initiated network connection
to remote node YRNODE
Data compression is enabled
************************************************************
```

Example 7.10. Data Compression Is Enabled with Network Connection from the Remote Node

```
************************************************************
Type   : OTHER     Time   : 31-Jul-1992 15:52:55.42
Text   : Process ACMS01EXC003000 accepted network connection
from remote node YRNODE Data compression is enabled
************************************************************
```

7.2.5. Disabling Logging of Network Connections

After you verify that data compression is being used only on network connections with the nodes you specified, you might want to disable logging on a per-process basis. To disable logging of network connection information, deassign the ACMS$AUDIT_NETWORK_CONNECTIONS logical name. Note that ACMS does not automatically log network connection information.

To explicitly disable logging of network connection information, define the ACMS$AUDIT_NETWORK_CONNECTIONS logical name as a string beginning with anything other than T, t, Y, or y, or define it as a failure status (an even number). For example, use the following command to disable logging of network connection information for a process running a user-written agent:

```
$ DEFINE/PROCESS   ACMS$AUDIT_NETWORK_CONNECTIONS   N
```

After you disable auditing, any processes logging network connection information do not stop logging this information until the processes or the programs they are executing are restarted.

7.3. Monitoring Data Compression

ACMS uses the DECtrace layered product to monitor the extent to which messages sent over the network are compressed. ACMS logs an DECtrace point event, called the COMPRESSED_MSG event, every time a network message is sent or received.

By default, DECtrace collects items for the COMPRESSED_MSG event whenever data compression is enabled, provided that you specify the PERFORMANCE or ALL collection class in your facility selection. See *Section 15.3.1, "Describing ACMS Events and Items"* for more information about the COMPRESSED_MSG event.

Table 7.1, "Information Collected for Compressed Messages" describes the information that DECtrace collects for each network message.

Table 7.1. Information Collected for Compressed Messages

Item	Description
Source node	Name of the node that sent the message
Destination node	Name of the node that received the message
Original message length	Length in bytes of the message before data compression
Compressed message length	Length in bytes of the message after data compression
Compression ratio	Factor by which ACMS compressed the message

Chapter 8. Controlling the ACMS System

This chapter describes how to use ACMS operator commands to:

- Start and stop the ACMS system
- Control the Terminal Subsystem Controller (TSC)
- Control operator terminals
- Control the Queued Task Initiator (QTI)
- Start and stop ACMS task queues
- Cancel ACMS users

See *Section 8.9, "Summary of Operator Commands and Qualifiers"* for a summary of ACMS operator commands. For reference information about the operator commands described in this chapter, see *Chapter 21, "Operator Commands"*.

8.1. Starting the ACMS System

This section describes how to start the ACMS system automatically and interactively. For a complete list of quotas, privileges, and SYSGEN parameters required by ACMS processes, see *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"*.

Before you start ACMS for the first time, use the OpenVMS Authorize Utility to make sure that the user names assigned to the following processes are authorized OpenVMS user names with sufficient privileges and quotas:

- ACMS Central Controller (ACC)
- Terminal Subsystem Controller (TSC)
- Command Process (CP)
- Application Execution Controller (EXC)
- Queued Task Initiator (QTI)

If these processes are not authorized, use the OpenVMS Authorize Utility to set up accounts for the user names and then use the ACMS User Definition Utility (UDU) to authorize the user names. The CP and QTI process user names need to be authorized as agents in the UDU authorization file. See *Chapter 3, "Authorizing Users"* for information about authorizing these processes as agents.

See *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* for information on setting privileges and quotas for ACMS process user names. See *Chapter 3, "Authorizing Users"* for information on authorizing ACMS process user names.

After starting ACMS, check the state of the system by using the **ACMS/SHOW SYSTEM** command as described in *Section 8.3, "Displaying System Information"*. If the ACMS system or applications did not start, use the Software Event Logger Utility Program (SWLUP) and the Audit Trail Report (ATR) Utility for reports of system errors.

8.1.1. Starting ACMS Automatically

In most cases, you want to start ACMS automatically whenever the OpenVMS system starts. Start the ACMS system automatically when you bring up OpenVMS by editing your site-specific system startup file, SYS$MANAGER:SYSTARTUP_VMS.COM.

The following steps describe how to edit SYSTARTUP_VMS.COM and include operator commands to start up the ACMS system.

1. Include the command that invokes the ACMS startup file, ACMSTART.COM, in your OpenVMS system startup file. Position this new command line *after* the line that invokes the network startup command procedure and, if TDMS is installed on your system, *after* the command that invokes TDMS. For example:

   ```
   $ @SYS$MANAGER:STARTNET.COM
   .
   .
   .
   $ @SYS$MANAGER:TDMSTRTUP.COM
   .
   .
   .
   $ @SYS$STARTUP:ACMSTART.COM
   ```

   It is important that the network be started before ACMS is started.

2. For distributed ACMS applications, run the ACMS startup files by including these pointers in your OpenVMS startup file:

   ```
   $ @STARTNET.COM       ! or SUBMIT STARTNET.COM
   $ @ACMSTART.COM       ! or SUBMIT ACMSTART.COM
   ```

3. Include the **ACMS/START SYSTEM /QTI** operator command to start the ACMS system and the ACMS QTI:

   ```
   $ ACMS/START SYSTEM /QTI
   ```

   At this point, you can also include the ACMS operator commands to enable operator terminals and start ACMS applications. For example:

   ```
   $ ACMS/SET SYSTEM /OPERATOR /TERMINAL=(OPA0:)
   $ ACMS/START APPLICATION DEPARTMENT,INVENTORY
   ```

Even if you start ACMS automatically, you can still use ACMS commands to start and stop interactively the ACMS system, ACMS applications, and ACMS components.

Instead of editing SYSTARTUP_VMS.COM and adding the commands in step 2 and step 3 manually, you can invoke the postinstallation command procedure ACMS_POST_INSTALL.COM to define your system's startup options. However, even if you do run ACMS_POST_INSTALL.COM, you need to add the commands described in step 1 to invoke the ACMS startup file ACMSTART.COM.

To run ACMS_POST_INSTALL.COM, set your default to SYS$MANAGER and enter the following command:

```
$ @ACMS_POST_INSTALL.COM
```

ACMS_POST_INSTALL.COM creates the command file ACMS_SETUP.COM which defines ACMS logicals and executes ACMS startup commands each time your system boots. ACMS_POST_INSTALL.COM can also be used to install the ACMS utility images as shared images and to start ACMS applications.

8.1.2. Starting ACMS Interactively

Start ACMS interactively by using the **ACMS/START SYSTEM** command:

```
$ ACMS/START SYSTEM
```

Once you enter the **ACMS/START SYSTEM** command, the ACMS ACC (the main control point of the ACMS system) and the ACMS TSC are started. The ACC must be active before you can start an application. The TSC must be active before users can sign in to ACMS and use an application.

When you start the TSC, ACMS allocates any terminal that is currently free. Before you start ACMS, make sure that ACMS-controlled terminals are not being used by OpenVMS users. If users are logged in to OpenVMS, ACMS cannot allocate their terminals as ACMS-controlled terminals. ACMS lists the terminals it cannot allocate in the Audit Trail Log.

Prevent new users from signing in while you are starting ACMS by specifying the **/NOTERMINALS** qualifier with the **ACMS/START SYSTEM** command. The **/NOTERMINALS** qualifier delays sign-ins by not starting the TSC. Once you have started ACMS, you can start the TSC separately by using the **ACMS/START TERMINALS** command. See *Section 8.4, "Terminal Subsystem Controller "* for more information about stopping and starting the TSC.

When you start the ACMS system, you also have the option of starting the ACMS Queued Task Initiator (QTI). To start the QTI, use the **/QTI** qualifier with the **ACMS/START SYSTEM** command. For example:

```
$ ACMS/START SYSTEM/QTI
```

Once you start the QTI you can start ACMS task queues. See *Section 8.7.1, "Starting Task Queues"* for more information about starting task queues.

8.2. Stopping the ACMS System

Stop the ACMS system automatically by editing and then executing the SYS$MANAGER:SYSHUTDWN.COM command file, or interactively by using the **ACMS/STOP SYSTEM** command.

8.2.1. Stopping ACMS Automatically

To stop ACMS automatically, include the following command in your OpenVMS site-specific shutdown file SYS$MANAGER:SYSHUTDWN.COM:

```
$ ACMS/STOP SYSTEM/CANCEL
```

```
$ @SYS$STARTUP:ACMSTOP.COM
```

The first command shuts down the ACMS system, including all applications, the TSC, and the QTI. The **/CANCEL** qualifier cancels all tasks running in applications or being executed by the QTI. Including the **ACMS/STOP SYSTEM/CANCEL** command in the system shutdown file ensures that the ACMS system processes are properly run down. If you omit the **/CANCEL** qualifier and there are active tasks, the **ACMS/STOP SYSTEM** command does not execute until all tasks stop or until the command times out after five minutes. Tasks are not canceled when the **ACMS/STOP** command times out.

The second command line invokes the command procedure ACMSTOP.COM. ACMSTOP.COM is a shutdown command file for ACMS. It deinstalls ACMS images (using the OpenVMS Install Utility) and deassigns the logical ACMS$EXAMPLES.

8.2.2. Stopping ACMS Interactively

You can use the **ACMS/STOP SYSTEM** command interactively or from a command file to stop ACMS without stopping OpenVMS, but you must first stop all active tasks. Otherwise, ACMS waits for the tasks to complete before executing the **ACMS/STOP SYSTEM** command. If tasks do not complete within five minutes, the command is ignored and ACMS returns you to the DCL prompt.

You can cancel all tasks and stop the ACMS system simultaneously by using the **/CANCEL** qualifier with the **ACMS/STOP SYSTEM** command. The following command cancels all active tasks and stops ACMS applications, the TSC, and the ACMS system software:

```
$ ACMS/STOP SYSTEM/CANCEL
```

As a courtesy to users, use the DCL **REPLY** command to ask users to finish their tasks and sign out before issuing this command.

Note

When you specify the **ACMS/STOP SYSTEM** command, the ACC stops all ACMS processes and the TSC before stopping itself. If you issue an **ACMS/STOP SYSTEM** command when the ACMS Central Controller is not active, all processes whose names begin with ACMS0 are deleted. This provides a way to stop an ACMS system that is in an improper state. If users are signed in with process names that begin with ACMS0, their processes are also stopped.

If you interrupt the **ACMS/STOP SYSTEM** command by pressing **Ctrl/Y**, the ACMS system may not shut down properly. Issuing subsequent **ACMS/STOP SYSTEM** commands can cause the error "message truncation" to occur. If you receive this error, shut down the ACMS system by specifying the DCL command **STOP** to halt the ACC. Then, use the **ACMS/STOP SYSTEM** command to stop any remaining ACMS processes.

8.3. Displaying System Information

The **ACMS/SHOW SYSTEM** command provides you with the following information:

1. The state of the system. The four ACMS system states are:
   - Starting
   - Started

- Stopping
- Stopped

While an **ACMS/START SYSTEM** command is processing, ACMS is in the starting state. When the command is through processing, ACMS is in a started state. While an **ACMS/STOP SYSTEM** command is processing, ACMS is in the stopping state. When the **ACMS/STOP SYSTEM** command is finished processing, ACMS is in a stopped state.

2. Users currently signed in to the system. Information about each user includes:
   - OpenVMS user name
   - Task submitter identification code assigned at sign-in
   - OpenVMS process identification for the Command Process or agent handling the user's terminal
   - Device name for the user's terminal
3. Active Application Execution Controllers. Information about the EXCs includes:
   - The names of all active applications
   - OpenVMS process information for all active applications

Example 8.1, "ACMS/SHOW SYSTEM Command" shows the output from the **ACMS/SHOW SYSTEM** command. To get information about system activity over a period of time, such as the number of sign-ins in the last hour, you can use the ATR Utility, which is described in *Chapter 12, "Auditing Applications with the Audit Trail Logger"*.

Example 8.1. ACMS/SHOW SYSTEM Command

```
$ ACMS/SHOW SYSTEM
                ❶
  ACMS V4.0   Current System State: STARTED Time: 1-MAY-1994 13:34:35.28
 ❷  Terminal Subsystem State:     STARTED
 ❸  Queued Task Initiator State:  STOPPED
 ❹  System Auditing State:        ENABLED
 ❺  Active ACMS Users
   User Name      Submitter ID        Agent PID      Device
   JONES          ALLDAY::0001000D    22000122       TTB1:
   ROBINSON       ALLDAY::00020013    22000122       TTH0:
 ❻  Active Execution Controllers
   Application Name           Process Name    EXC PID
   DEPARTMENT                 ACMS01EXC001000 00610046
   MARKETING                  ACMS01EXC003000 2200047C
```

The following is a description of the numbered items in *Example 8.1, "ACMS/SHOW SYSTEM Command"*.

❶ System state

Current system state

❷ Terminal Subsystem State

Current state of the TSC

❸ Queued Task Initiator State

Current state of the QTI

❹ System Auditing State

Whether system auditing is enabled or disabled

❺ Active ACMS Users

Information about all active users

❻ Active Execution Controllers

Information about all active EXCs

You can specify the **/POOL** qualifier with the **ACMS/SHOW SYSTEM** command to display pool information for the system. When you specify the **/POOL** qualifier, information about current users and active EXCs is not displayed. *Example 8.2, "ACMS/SHOW SYSTEM/POOL Command"* shows the pool information displayed with the **ACMS/SHOW SYSTEM/POOL** command.

Example 8.2. ACMS/SHOW SYSTEM/POOL Command

```
$ ACMS/SHOW SYSTEM/POOL
ACMS V4.0       Current System State: STARTED   Time: 1-MAY-1994
 11:20:49.66
  Terminal Subsystem State:     STARTED
  Queued Task Initiator State:  STOPPED
  System Auditing State:        ENABLED
ACMS System Message Switch Pools
     ❶                ❷         ❸              ❹         ❺             ❻

  Process         Pool      Free  (pct)  Largest    Allocation    Garbage
      name          size      bytes         block      failures
 collections
< Shared Pool >    262144    228056 (86%)   65536          0            0
ACMS01ACC001000    131072    121168 (92%)   65536          0            0
ACMS01ATL001000    131072    127024 (96%)   65536          0            0
ACMS01TSC001000    131072    126544 (96%)   65536          0            0
ACMS01CP001000     131072    123824 (94%)   65536          0            0
ACMS01EXC008000    131072    123312 (94%)   65536          0            0
ACMS008SP001000    131072    125552 (95%)   65536          0            0
ACMS008SP002013    131072    126704 (96%)   65536          0            0
```

The following is a description of the numbered items in *Example 8.2, "ACMS/SHOW SYSTEM/POOL Command"*:

❶ Process name

The process name for which message switch pool information is shown. The pool shared by all processes is shown with the name.

❷ Pool size

The total size of the pool, in bytes.

❸ Free bytes

The number of free bytes of pool space available and the percentage available.

❹ Largest block

The size of the largest block of free pool space, in bytes.

❺ Allocation failures

The number of times ACMS attempted and failed to allocate pool space.

❻ Garbage collections

The number of times ACMS attempted to use fragmented pool space.

8.4. Terminal Subsystem Controller

The Terminal Subsystem Controller (TSC) controls which terminals can sign in to ACMS. It also allocates any ACMS-controlled terminals. Before terminal users can sign in to ACMS and use an application, the Terminal Subsystem Controller must be active.

8.4.1. Starting the TSC

Start the TSC either at the same time you start the ACMS system (as described in *Section 8.1.2, "Starting ACMS Interactively"*), or after you start the ACMS system and some ACMS applications. If the TSC is not started, users cannot sign in to ACMS. You can start the TSC separately from the ACMS system by issuing the **ACMS/START TERMINALS** command.

The following sequence of commands starts the ACMS system without starting the TSC, thus disabling sign-ins. The **ACMS/START APPLICATION** command starts the applications INVENTORY and ACCOUNTING. After the applications are started, the **ACMS/START TERMINALS** command starts the ACMS TSC. Users can then sign in to ACMS.

```
$ ACMS/START SYSTEM/NOTERMINALS
$ ACMS/START APPLICATION INVENTORY,ACCOUNTING
$ ACMS/START TERMINALS
```

You can start the TSC only when ACMS is active. When you start the TSC, make sure users are not signed in at terminals you have defined to sign in directly to ACMS. If users are signed in at the designated terminals, the terminals cannot be controlled by ACMS. ACMS lists the terminals it cannot control in the Audit Trail Log. Once the users sign out, use the **ACMS/RESET TERMINALS** command to control the terminals.

8.4.2. Stopping the TSC

The **ACMS/STOP TERMINALS** command stops the TSC, canceling active tasks and signing users out of ACMS. Until you restart the TSC, users cannot sign in to ACMS. When the TSC is stopped, ACMS-controlled terminals are released. You might want to stop the TSC if you need to keep users from signing in to ACMS or if you need to stop all ACMS activity by users.

The following is an example of the **ACMS/STOP TERMINALS** command:

```
$ ACMS/STOP TERMINALS
```

Before you stop the TSC, use the DCL **REPLY** command to ask users to finish their tasks and sign out. Then, use the **ACMS/SHOW TASKS** command to check that tasks have stopped.

8.5. Operator Terminals

ACMS sends status messages and other operational messages to terminals that you define as ACMS operator terminals. Terminals that you define as operator terminals receive messages if an application, the Audit Trail Log, or the TSC stop unexpectedly. An ACMS operator terminal can also be an OpenVMS operator terminal. ACMS also logs status and operational messages in the Software Event Log (SWL) file (see *Chapter 13, "Logging Software Events"*).

8.5.1. Enabling Operator Terminals

Once you start the ACMS system, you can specify the **ACMS/SET SYSTEM** command with the **/OPERATOR** qualifier to enable ACMS operator terminals. Either place the **ACMS/SET SYSTEM/OPERATOR** command in your SYS$MANAGER:SYSTARTUP_VMS.COM file, or use the command interactively.

When you use the **/OPERATOR** qualifier, you must also use either the **/PROCESS** or the **/TERMINAL** qualifier.The **/PROCESS** qualifier enables your terminal as an ACMS operator terminal for the duration of your process, until ACMS stops, or until you disable the terminal. The **/TERMINAL** qualifier enables one or more terminals as ACMS operator terminals until ACMS stops or until you disable the terminals.

The following command enables terminals TTE1 and TTE2 as operator terminals:

```
$ ACMS/SET SYSTEM/OPERATOR/TERMINAL=(TTE1,TTE2)
```

When you specify more than one device name with the **/TERMINAL** qualifier, separate the device names with commas and enclose them in parentheses. Specify a terminal with the **/TERMINAL** qualifier even if no one is logged in at that terminal.

You can determine which terminals are authorized as ACMS operator terminals by looking at the Audit Trail Log. For each terminal enabled as an operator terminal, the Audit Trail Log contains the entry, "Successful permanent operator enabled ", and shows the device name. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* in this manual for more information about the ACMS Audit Trail Log.

8.5.2. Disabling Operator Terminals

To disable ACMS operator terminals, use the **ACMS/SET SYSTEM** command with the **/NOOPERATOR** qualifier. When you specify the **/NOOPERATOR** qualifier, you must also specify either the **/PROCESS** or the **/TERMINAL** qualifier. The **/PROCESS** qualifier disables your own terminal. The **/TERMINAL** qualifier identifies the terminal to be disabled.

The following command disables your own terminal:

```
$ ACMS/SET SYSTEM/NOOPERATOR/PROCESS
```

This command disables the TTE1 and TTE2 terminals:

```
$ ACMS/SET SYSTEM/NOOPERATOR/TERMINAL=(TTE1,TTE2)
```

For each terminal disabled as an operator terminal, the Audit Trail Log contains the entry, "Successful permanent operator disabled" and shows the device name. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* in this manual for more information about the ACMS Audit Trail Log.

8.6. Queued Task Initiator

The Queued Task Initiator (QTI) is an ACMS run-time component which processes ACMS task queues by dequeuing queued task elements and initiating the associated task. The QTI user name must be authorized as an agent using the UDU. Before you can start ACMS task queues, you must start the QTI. Start the QTI either when you bring up the ACMS system or after ACMS is started. See *VSI ACMS for OpenVMS Concepts and Design Guidelines* [https://docs.vmssoftware.com/vsi-acms-concepts-and-design-guide/] for detailed information about the QTI and the ACMS queuing facility.

8.6.1. Starting the QTI

To start the QTI after the ACMS system is started, use the **ACMS/START QTI** command. For example:

```
$ ACMS/START QTI
```

Once the ACMS QTI is started, you can then start task queues by specifying the **ACMS/START QUEUE** command. See *Section 8.7.1, "Starting Task Queues"* for information about starting task queues.

8.6.2. Stopping the QTI

To stop the QTI, specify the **ACMS/STOP QTI** command. The **ACMS/STOP QTI** command also stops all task queues. For example:

```
$ ACMS/STOP QTI
```

Unless you specify the **/CANCEL** qualifier with the **ACMS/STOP QTI** command, ACMS waits for all active tasks to complete before stopping the QTI. There is no timeout period. The following command stops the QTI, all task queues, and any active tasks:

```
$ ACMS/STOP QTI/CANCEL
```

8.6.3. Displaying QTI Information

Get information about the QTI by specifying the **ACMS/SHOW QTI** command. The **ACMS/SHOW QTI** command displays the run-time characteristics of the QTI. *Example 8.3, "ACMS/SHOW QTI Command"* shows the output from an **ACMS/SHOW QTI** command.

Example 8.3. ACMS/SHOW QTI Command

```
$ ACMS/SHOW QTI
  ACMS V4.0   ACMS QTI - QUEUED TASK INITIATOR  Time:  1-MAY-1994
 16:16:05.52
❶  State:  STARTED                ❷    User Name:          ROLEX
❸  PID:    11000211               ❹    Process Name:       ACMS01QTI00400
```

```
❺ Queues: 2                    ❻    Submitter count:    6
```

The following is a description of the numbered items in *Example 8.3, "*ACMS/SHOW QTI Command*"*:

❶ State

Whether the QTI is started or stopped.

❷ User Name

The OpenVMS user name for the QTI. This is defined by the ACMSGEN parameter QTI_USERNAME.

❸ PID

Process ID of the QTI process.

❹ Process Name

Process name of the QTI process.

❺ Queues

Number of currently active task queues.

❻ Submitter count

Number of submitters currently signed in by the QTI.

8.7. Task Queues

Once you create task queues with ACMSQUEMGR and start the QTI, you can start and stop ACMS task queues. See *Chapter 5, "Creating and Managing Queues"* for information about how to create task queues.

8.7.1. Starting Task Queues

Once you start the QTI, you can start task queues with the **ACMS/START QUEUE** command. The following command starts the queue MY_QUE:

```
$ ACMS/START QUEUE MY_QUE
```

Once you start a task queue, the QTI begins dequeuing and initiating tasks in the queue.

You must specify at least one queue name with the **ACMS/START QUEUE** command. You can start more than one queue by separating the queue names with commas.

You can specify the **/ERROR_QUEUE** and **/TASK_THREADS** qualifiers with the **ACMS/START QUEUE** command. The **/ERROR_QUEUE** qualifier allows you to specify the name of an error queue for a task queue. Tasks that do not complete successfully are placed in the error queue (unless they are to be retried), and ACMS records any errors in the Audit Trail Log. The **/TASK_THREADS** qualifier allows you to determine the maximum number of concurrent outstanding task elements that the QTI processes for the specified queue.

The error queue you specify with the **/ERROR_QUEUE** qualifier must exist. You can create an error queue with the ACMS Queue Manager (ACMSQUEMGR) Utility. See *Chapter 5, "Creating and Managing Queues"* for information about how to create an error queue.

The following command starts the task queues MY_QUE and NEW_QUE and specifies that if a task does not complete successfully in either queue, the task should be placed in the error queue ERR_QUE (unless it is to be retried). Any errors are recorded in the Audit Trail Log.

```
$  ACMS/START QUEUE/ERROR_QUEUE=ERR_QUE MY_QUE,NEW_QUE
```

You can specify a value from 1 through 256 with the **/TASK_THREADS** qualifier. The default is **/TASK_THREADS=1**. The following command starts the queue YOUR_QUE and specifies that the maximum number of concurrent tasks that can execute on YOUR_QUE is 12:

```
$ ACMS/START QUEUE YOUR_QUE/TASK_THREADS=12
```

8.7.2. Stopping Task Queues

You can stop a task queue with the **ACMS/STOP QUEUE** command. The queue you specify must exist and be currently started. You must specify at least one queue name. The following command stops the queue MOD_QUE:

```
$ ACMS/STOP QUEUE MOD_QUE
```

You can stop more than one queue by separating the queue names with commas.

Unless you specify the **/CANCEL** qualifier, the **ACMS/STOP QUEUE** command does not complete until all outstanding tasks in the queues have stopped. The following command stops all outstanding tasks in queue MY_QUE and stops queue MY_QUE:

```
$ ACMS/STOP QUEUE/CANCEL MY_QUE
```

Queued task elements that have been canceled remain in the queue repository file.

8.7.3. Displaying Task Queue Information

You can display information about ACMS task queues by specifying the **ACMS/SHOW QUEUE** command. The **ACMS/SHOW QUEUE** command displays information about queues currently being processed by the QTI. Because no queue name is specified, the **ACMS/SHOW QUEUE** command in *Example 8.4, "ACMS/SHOW QUEUE Command"* displays queue information for all active queues.

Example 8.4. ACMS/SHOW QUEUE Command

```
$ ACMS/SHOW QUEUE
  ACMS V4.0    QUEUED TASK QUEUES              Time: 1-MAY-1994 16:16:05.52
❶  Task Queue: MECCAQUEUE
  ❷    Threads:     4       ❸     Successful tasks invocations:783
  ❹    Active Tasks: 2      ❺     Failed tasks invocations:    4
  ❻    Error Queue: MECCAERROR_QUEUE

  Task Queue: MY_QUE
    Threads:     6            Successful tasks invocations: 620
    Active Tasks: 4           Failed tasks invocations:     2
    Error Queue: MYERROR_QUEUE
```

The following is a description of the numbered items in *Example 8.4, "ACMS/SHOW QUEUE Command"*:

❶ Task Queue

Name of the queue.

❷ Threads

Maximum number of concurrent tasks that can be processed by the queue.

❸ Successful task invocations

Number of tasks that completed successfully.

❹ Active tasks

Number of currently active tasks.

❺ Failed task invocations

Number of tasks that failed.

❻ Error Queue

Name of the error queue associated with the task queue.

8.8. Canceling ACMS Users

ACMS lets you cancel users manually with the **ACMS/CANCEL USER** command or automatically by using the SYS$MANAGER:ACMSCANCEL.COM command procedure. The **ACMS/CANCEL USER** command allows you to sign out an active ACMS user. The command procedure can be used only to sign out inactive users.

8.8.1. Canceling Users with the ACMS/CANCEL USER Command

Use the **ACMS/CANCEL USER** command to cancel users before bringing down the ACMS system. When you use the **ACMS/CANCEL USER** command, you not only sign out the users you specify, you also cancel any tasks they have selected from a menu, plus any tasks that have been called by those tasks.

Use qualifiers to cancel users by user name, device name, or submitter ID. Use the **ACMS/SHOW USER** command to display user information.

If you do not use qualifiers or specify user names, the **ACMS/CANCEL USER** command cancels all active users and prompts you to confirm each cancellation.

When you name a user with the **ACMS/CANCEL** command, you cancel all users with the name you specify. In this example, only one user has the user name ADAMS:

```
$ ACMS/CANCEL USER ADAMS
User Name:  ADAMS                Submitter ID:  MONEY::00010030
  Agent PID:  204002D            Device:        RTA6:
```

```
Submitter ID:   MONEY::00010030 (Y/[N]):Y
```

By default, the **ACMS/CANCEL USER** command asks that you confirm the cancellation by typing Y, for yes. ACMS cancels users without prompting you if you use the **/NOCONFIRM** qualifier, but it is safer to confirm each cancellation. In either case, you can include the **/LOG** qualifier with the **ACMS/CANCEL USER** command. The **/LOG** qualifier displays a message that confirms each successful cancellation.

On a distributed ACMS system, **ACMS/CANCEL USER** cannot cancel remote users (submitters).

8.8.2. Canceling Users with ACMSCANCEL.COM

You can use the command procedure ACMSCANCEL.COM to cancel inactive ACMS users. ACMSCANCEL.COM is located in the directory SYS$MANAGER. By default, ACMS writes cancellation information to the file ACMS$CANCEL.LOG in the SYS$MANAGER directory.

If you do not want cancellation information written to the SYS$MANAGER directory, define the logical ACMS$CANCEL_DIR to point to a directory where you want user cancellation information placed. For example:

```
$ DEFINE/SYSTEM ACMS$CANCEL_DIR $DISK1:[MYDIR]
```

If you do not define ACMS$CANCEL_DIR, you must have write access to the SYS$MANAGER directory before using ACMSCANCEL.COM.

After you define ACMS$CANCEL_DIR, or if you have write access to SYS$MANAGER, run the command procedure by submitting it to a batch queue:

```
$ SUBMIT SYS$MANAGER:ACMSCANCEL.COM
```

By defining the logical name ACMS$CANCEL_USER_WAIT as a group or system logical, you can choose the length of time that ACMSCANCEL.COM waits before canceling inactive users. By default, ACMSCANCEL.COM cancels all users who have been inactive for one hour. The following command tells ACMSCANCEL.COM to wait 1 hour and 45 minutes before canceling any inactive users:

```
$ DEFINE/SYSTEM ACMS$CANCEL_USER_WAIT 01:45
```

8.8.3. Displaying User Information

The **ACMS/SHOW USER** command displays information about ACMS users. Include one or more user names as parameters. If you include more than one user name, separate the names with a comma. If you do not include a user name, ACMS displays information about all users signed in to ACMS.

Use the **/DEVICE** qualifier to display information about a user at a specific terminal. The following command displays information about the user JONES signed in at terminal TTHO:.

```
$ ACMS/SHOW USER JONES/DEVICE=TTH0:
```

By default, ACMS does not display task information when you use the **ACMS/SHOW USER** command. For information about the tasks that users are running, specify the **/FULL** qualifier with the **ACMS/SHOW USER** command. However, the **ACMS/SHOW USER /FULL** command only displays the task selected by a user from the ACMS menu. It does not display any tasks called by a task. To display all task instances in a sequence of task calls, use the **ACMS/SHOW TASKS** command. *Example 8.5, "ACMS/SHOW USER/FULL Command"* contains sample output from the **ACMS/SHOW USER/FULL** command.

Example 8.5. ACMS/SHOW USER/FULL Command

```
$ ACMS/SHOW USER/FULL
  ACMS V4.0      CURRENT USERS           Time:  1-MAY-1994 20:11:04.21
 ❶  User Name:     JONES       ❷  Submitter ID:   KARAT::00010027
 ❸  Agent PID:  22E000A4       ❹  Device:         VTA5:

      ❺ Task Name:           DELETE
           ❻ Task ID:         KARAT::00010029-0000000F
           ❼ Appl Name:       TEST1
           ❽ Appl Node:       ALLDAY::
```

This command displays task information for each local submitter, including their remote task selections. This command does not display information about remote submitters. The following is a description of the numbered items in *Example 8.5, "ACMS/SHOW USER/FULL Command"*:

❶ User Name

OpenVMS user name for a user signed in to ACMS.

❷ Submitter ID

ACMS task submitter identification code assigned to the user at sign-in. Refer to *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about submitter identification codes.

❸ Agent PID

OpenVMS process ID (PID) for a submitter's agent process. For those submitters signed in to the TSC, this is the process ID of the submitter's Command Process.

❹ Device

ACMS login device of the submitter.

❺ Task Name

Name of the task that the user is running. The task name is the name defined for the task in the task group definition.

❻ Task ID

ACMS task identification code for the task the user is running. Refer to *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information on task identification codes.

❼ Appl Name

Name of the application in which the task is running.

❽ Appl Node

Name of the node on which the application is running.

Example 8.5, "ACMS/SHOW USER/FULL Command" shows that JONES is running a task named DELETE on node ALLDAY at terminal VTA5. If more than one user is signed in under the user name JONES, the command displays information about all users named JONES.

8.9. Summary of Operator Commands and Qualifiers

Table 8.1, "Summary of Operator Commands" lists the ACMS operator commands and their qualifiers and provides a brief description of each command. For detailed information about the operator commands and qualifiers, see *Chapter 21, "Operator Commands"*.

Table 8.1. Summary of Operator Commands

Commands and Qualifiers	Description
ACMS/CANCEL TASK /APPLICATION=*application-name* /[NO]CONFIRM /DEVICE=*device-name* /IDENTIFIER=*task-id* /[NO]LOG /SUBMITTER=*submitter-id* /USER=*user-name*	Stops task instances.
ACMS/CANCEL USER /[NO]CONFIRM /DEVICE=*device-name* /[NO]LOG /SUBMITTER=*submitter-id*	Stops all tasks for the user and logs the user out of ACMS.
ACMS/DEBUG /AGENT_HANDLE /PID /SERVER /TWS_POOLSIZE[=*n*] /TWSC_POOLSIZE[=*n*] /WORKSPACE	Starts the ACMS Task Debugger.
ACMS/ENTER /[NO]RETURN	Signs users in to ACMS. This command does not require OPERATOR privilege.
ACMS/INSTALL /[NO]REMOVE	Installs an application database (.ADB) file in ACMS$DIRECTORY.
ACMS/MODIFY APPLICATION /APPLICATION_ATTRIBUTES /[NO]CONFIRM /[NO]LOG /SERVER_ATTRIBUTES /TASK_ATTRIBUTES	Modifies the attributes of an active application.
ACMS/REPLACE SERVER /APPLICATION=*application-name* /[NO]CONFIRM /[NO]LOG	Replaces a server image with a new version of that image.
ACMS/REPROCESS APPLICATION_SPEC /[NO]CONFIRM /[NO]LOG	Causes ACMS to retranslate the file specification of an application.

Commands and Qualifiers	Description
ACMS/RESET AUDIT	Creates a new version of the Audit Trail Log file when ACMS is active.
ACMS/RESET TERMINALS	Makes recently assigned sign-in characteristics in DDU definitions available to ACMS.
ACMS/SET QUEUE /TASK_THREADS=*n*	Sets the processing characteristics of a started queue.
ACMS/SET SYSTEM /[NO]AUDIT /[NO]OPERATOR /PROCESS /TERMINAL=*device-name*	Depending on the qualifiers used, enables or disables the Audit Trail Log or ACMS operators' terminals.
ACMS/SHOW APPLICATION /CONNECTION /DETACHED_TASKS /POOL /SERVER_ATTRIBUTES /TASK_ATTRIBUTES	Displays information about one or more active ACMS applications in static mode.
ACMS/SHOW APPLICATION/CONTINUOUS /[NO]BEGINNING_TIME=*time* /[NO]ENDING_TIME=*time* /[NO]INTERVAL[=*seconds*] /[NO]OUTPUT[=*file-spec*]	Displays information about one or more active ACMS applications in continuous refresh mode.
ACMS/SHOW QTI	Displays the run-time characteristics of the QTI.
ACMS/SHOW QUEUE	Displays active queue information.
ACMS/SHOW SERVER /APPLICATION=*application-name*	Displays information about one or more servers.
ACMS/SHOW SYSTEM /POOL /ALL	Displays information about the ACMS run-time system.
ACMS/SHOW TASK /APPLICATION=*application-name* /DEVICE=*device-name* /IDENTIFIER=*task-id* /SUBMITTER=*submitter-id* /USER=*user-name*	Displays information about one or more active ACMS tasks executing on the local node.
ACMS/SHOW USER /ALL /APPLICATION /DEVICE=*device-name* /[NO]FULL /LOCAL /REMOTE /SUBMITTER	Displays information about ACMS users on the node where you specify the **`ACMS/SHOW USER`** command.

Commands and Qualifiers	Description
ACMS/START APPLICATION	Starts one or more ACMS applications.
ACMS/START QTI	Starts the QTI.
ACMS/START QUEUE /ERROR_QUEUE=*error-queue-name* /TASK_THREADS=*n*	Starts a queue and any tasks in the queue.
ACMS/START SYSTEM /[NO]AUDIT /[NO]QTI /[NO]TERMINALS	Starts the ACMS system.
ACMS/START TASK /[NO]LOG /[NO]RETRY_LIMIT[=*n*] /SELECTION_STRING=*selection_string* /USERNAME=*username* /WAIT_TIMER=*n*	Starts a detached task in the specified application.
ACMS/START TERMINALS	Starts the TSC.
ACMS/STOP APPLICATION /[NO]CANCEL	Stops one or more ACMS applications.
ACMS/STOP QTI /[NO]CANCEL	Stops the QTI and all task queues.
ACMS/STOP QUEUE /[NO]CANCEL	Stops the specified queue.
ACMS/STOP SYSTEM /[NO]CANCEL	Stops ACMS applications, the TSC, and ACMS.
ACMS/STOP TERMINALS	Stops the TSC.

Chapter 9. Installing and Managing Applications

This chapter describes the ACMS operator commands you can use to install and run ACMS applications, modify active applications, and cancel tasks. For reference information on the commands described in this chapter, refer to *Chapter 21, "Operator Commands"*.

9.1. Installing Applications

Before you can install an application, you must first be authorized by the Application Authorization Utility (AAU). See *Chapter 4, "Authorizing Applications"* for information on how to use the AAU to authorize users to install applications.

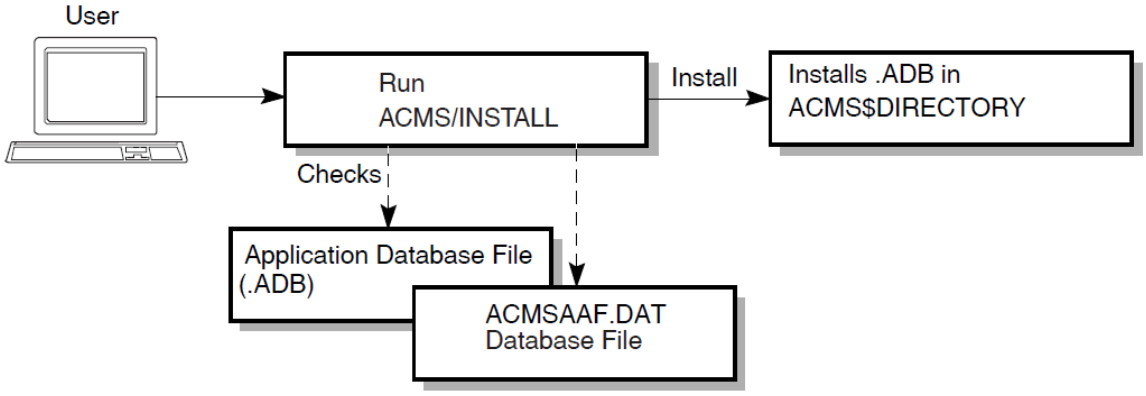
Once you are authorized by the AAU, install an application by issuing the **ACMS/INSTALL** command. You do not need any special OpenVMS privileges to install an application. The **ACMS/INSTALL** command installs applications in the directory pointed to by the logical name ACMS$DIRECTORY. All applications must be installed in ACMS$DIRECTORY before they can run on the ACMS system. When you enter the **ACMS/INSTALL** command, ACMS displays a message confirming that the application has been installed in ACMS$DIRECTORY. For example:

```
$ ACMS/INSTALL DISK1:[ACCOUNT]INVENTORY.ADB
%ACMSINS-S-ADBINS, Application DISK1:[ACCOUNT] -
INVENTORY.ADB has been installed in ACMS$DIRECTORY
```

This command installs the application INVENTORY in ACMS$DIRECTORY.

Figure 9.1, "Process of Installing an Application" shows the steps ACMS takes when installing an application.

Figure 9.1. Process of Installing an Application



If you attempt to install an application you are not authorized to install, ACMS displays the following messages, terminates the installation attempt, and returns you to DCL level:

```
%ACMSINS-E-INSFAIL, INSTALL command failed
-SYSTEM-F-NOPRIV, no privilege for attempted operation
$
```

Include either a file specification or the logical name of an application with the **ACMS/INSTALL** command. If you specify a logical name that is a search list, ACMS installs only the first available application in the search list.

When you install an application database file, the **ACMS/INSTALL** command checks the application authorization database file (ACMSAAF.DAT) to confirm that:

- The application named with the **ACMS/INSTALL** command has an authorization in the ACMSAAF.DAT file.
- The user running the **ACMS/INSTALL** command is authorized by the ACMSAAF.DAT file to install the application.
- The server user names in the application match the server user names that have been authorized in the ACMSAAF.DAT file.
- The application user name in the application matches the name assigned in the ACMSAAF.DAT file.
- The dynamic user name characteristic in the application matches the name assigned in the ACMSAAF.DAT file.

After checking the ACMSAAF.DAT file, AAU:

- Copies the application database file to the directory pointed to by the logical name ACMS$DIRECTORY.
- Deletes an earlier version if it exists.
- Changes the application database file UIC to [1,4], which is the SYSTEM account.

Once an application is installed, stop and restart ACMS to make the new version of the application available to users. *Chapter 8, "Controlling the ACMS System"* describes how to start and stop the ACMS system. If you are reinstalling an application, you must stop the application before you reinstall it.

After you stop and restart ACMS, you can run the application by using the **ACMS/START APPLICATION** command. See *Section 9.3, "Starting Applications"* for information on how to run an ACMS application.

9.2. Removing Applications

To delete an application from ACMS$DIRECTORY, specify the **/REMOVE** qualifier with the **ACMS/INSTALL** command and the file name of the application you want to remove. You must be authorized by the AAU before you can remove an application.

For example, you can delete the application installed in the example in the previous section by typing the following command. Once you enter this command, ACMS displays a message confirming that the application has been removed.

```
$ ACMS/INSTALL INVENTORY/REMOVE
%ACMSINS-S-ADBINSREM, Application INVENTORY
has been removed from ACMS$DIRECTORY
$
```

When you specify the **ACMS/INSTALL** command with the **/REMOVE** qualifier to delete an application, ACMS does the following:

- Checks the ACMSAAF.DAT file to confirm that the user running the **ACMS/INSTALL** command is authorized to delete the application from ACMS$DIRECTORY.
- Deletes the application database file from ACMS$DIRECTORY if the user running the **ACMS/INSTALL** command is authorized.

Specify only a file name when deleting an application from ACMS$DIRECTORY; do not specify device, directory, or file type. When you have a number of applications with different file names to remove from ACMS$DIRECTORY, you must remove them one at a time. You cannot specify more than one application, use the keyword $ALL, or use the wildcard character (*) with the **/REMOVE** qualifier.

9.3. Starting Applications

Once the ACMS system is up and running, you can start ACMS applications provided you have the OpenVMS OPER privilege. When you start an application, ACMS starts the application execution controller and allocates the resources the application needs. The tasks in the application are then ready for terminal users to select. Terminal users cannot select tasks that belong to an application that is not started.

The **ACMS/START APPLICATION** command starts one or more applications. Use the command interactively or include it in a command file. For example, the following command starts the application DEPARTMENT:

```
$ ACMS/START APPLICATION DEPARTMENT
```

Starting an application interactively helps you control the use of resources and the availability of required files and databases. You can start an application whenever ACMS is active.

9.4. Stopping Applications

The **ACMS/STOP APPLICATION** command stops the applications you name. You must have the OpenVMS OPER privilege to stop an application. When you stop an application, ACMS stops the application execution controller and releases the resources for the application. The tasks in the application are no longer available for users to select.

You might want to stop one or more ACMS applications if you:

- Want to free the resources an application has allocated because users are not running tasks in that application.
- Want to keep users from running tasks in an application.
- Need to replace an application database file in ACMS$DIRECTORY because you have redefined the characteristics of an application, its servers, or its tasks.

Unless you specify the **/CANCEL** qualifier, the **ACMS/STOP APPLICATION** command does not execute until all tasks in that application finish executing. Before using the **/CANCEL** qualifier, use the DCL **REPLY** command to ask users to finish their tasks. Then, use the **ACMS/SHOW TASK** command to check that users have stopped their tasks. Finally, issue the **ACMS/STOP APPLICATION /CANCEL** command to stop any remaining active tasks.

The following command cancels all active tasks in the INVENTORY and ACCOUNTING applications and then stops those applications.

```
$ ACMS/STOP APPLICATION INVENTORY, ACCOUNTING /CANCEL
```

9.5. Displaying Application Information

ACMS allows you to display information about applications in static or dynamic mode. **Static mode** displays information reflecting an application's state for an instant in time – that is, the instant in time at

which the command executes. **Dynamic mode** displays information about an application continually as it executes. The following sections describe how to display information about your application in either mode.

To get information about software errors that occur during the execution of ACMS application programs, use the ACMS Software Event Log Utility Program (SWLUP) which is discussed in *Chapter 13, "Logging Software Events"*.

9.5.1. Displaying Static Information

The **ACMS/SHOW APPLICATION** command displays information about active applications in static mode. You can specify the name of one or several applications with the **ACMS/SHOW APPLICATION** command. If you do not include the name of an application, ACMS displays information about all currently active applications. *Example 9.1, "ACMS/SHOW APPLICATION Command"* displays information about the application INVENTORY.

Example 9.1. ACMS/SHOW APPLICATION Command

```
$ ACMS/SHOW APPLICATION INVENTORY
  ACMS V4.0    CURRENT APPLICATIONS         Time: 1-MAY-1994 17:19:40.84
❶Application Name:   INVENTORY

     ❷ Object Name:          ACMS01EXC001000
     ❸ User Name:            ACMS             ❹ PID:
 22000123
     ❺
  Max Task Count:      655              ❻ Max SP Count:     35
     ❼ Cur Task Count:      0                ❽ Cur SP Count:     7
     ❾ Auditing:            ON               ❿ SP Mon. Interval: 5)
    ⓫                   ⓬        ⓭        ⓮         ⓯      ⓰
    Server Name          max SPs   min SPs active    free   waiting
                                                SPs       SPs    tasks
      INVSRV05                5         0       0         0      0
      INVSRV02                1         0       1         0      4
      INVSRV06                5         1       1         0      3
      INVSRV04                5         2       0         2      0
      INVSRV01                5         2       1         1      0
      INVSRV03                5         1       1         0      0
```

The following is a description of the numbered items in *Example 9.1, "ACMS/SHOW APPLICATION Command"*:

❶ Application Name

Name of the application.

❷ Object Name

Object name for the application.

❸ User Name

OpenVMS user name for the application.

❹ PID

Process identification code for the application.

❺ Max Task Count

Maximum number of task instances allowed for the application.

❻ Max SP Count

Maximum number of server processes allowed for the application.

❼ Cur Task Count

Current number of active tasks in the application.

❽ Cur SP Count

Current number of started server processes in the application.

❾ Auditing

Whether application auditing is enabled or disabled.

❿ SP Mon. Interval

Server process monitoring interval.

⓫ Server Name

Lists the names assigned in SERVER clauses in the application definition. Each row of the display contains information about server processes, and information about tasks waiting for those server processes.

⓬ max SPs

Maximum number of server processes allowed for this server.

⓭ min SPs

Minimum number of server processes allowed for the server.

⓮ active SPs

Number of server processes currently allocated to tasks for each server named in the application definition. *Example 9.1, "ACMS/SHOW APPLICATION Command"* shows that four server processes are active in the INVENTORY application.

⓯ free SPs

Number of server processes that are started and available for use for each server named in the application definition. *Example 9.1, "ACMS/SHOW APPLICATION Command"* shows that three server processes are free and thus available in the INVENTORY application for tasks that need them.

⓰ waiting tasks

Number of tasks waiting for server processes for each server named in the application definition. If no server processes are available, ACMS holds tasks that need server processes. *Example 9.1, "ACMS/SHOW APPLICATION Command"* shows that a total of seven tasks are waiting for some server processes.

Use the **/POOL**, **/SERVER_ATTRIBUTES**, or **/TASK_ATTRIBUTES** qualifier with the **ACMS/SHOW APPLICATION** command to display, respectively, pool information, the current settings of modifiable server attributes, and the current settings of modifiable task attributes for an application. *Example 9.2, "*ACMS/SHOW APPLICATION/POOL TEST *Command"* displays pool information for the application TEST.

Example 9.2. ACMS/SHOW APPLICATION/POOL TEST Command

```
$ ACMS/SHOW APPLICATION/POOL TEST
  ACMS V4.0       CURRENT APPLICATIONS            Time: 1-MAY-1994
 11:21:04.50
  Application Name: TEST                                      State:
 STARTED
      Object Name:        ACMS01EXC008000
      User Name:          ACMS$EXC                PID:
 25C01337
      Max Task Count:     65535                   Max SP Count:       5
      Cur Task Count:     0                       Cur SP Count:       2
      Auditing:           ON                      SP Mon. Interval:   5
    Application Workspace and Control Pools
          ❶             ❷           ❸             ❹          ❺
    ❻
          Pool          Pool      Free  (pct.)  Largest    Allocation
 Garbage
          type          size      bytes          block      failures
 collections
    Group/User workspace pools
❼      Control pool      65536     64848 (98%)    32768          0
  0
❽      Workspace pool   131072    130560 (99%)    65536          0
  0
❾   TEST_GRP01
❿    Control pool      25600     25088 (98%)    16384          0
 0
⓫    Workspace pool   179200    178688 (99%)    65536          0
 0
     TEST_GRP02
        Control pool      25600     25088 (98%)    16384          0
    0
        Workspace pool   179200    178688 (99%)    65536          0
    0
     DBMS_GRP
        Control pool      25600     25088 (98%)    16384          0
    0
        Workspace pool   179200    178688 (99%)    65536          0
    0
```

The following is a description of the numbered items in *Example 9.2, "*ACMS/SHOW APPLICATION/POOL TEST *Command"*:

❶ Pool type

Type of pool, either control or workspace pool.

❷ Pool size

Total size of the pool, in bytes.

❸ Free bytes

Number of free bytes of pool space available and the percentage available.

❹ Largest block

Size of the largest block of free pool space, in bytes.

❺ Allocation failures

Number of times ACMS attempted to allocate pool space but failed.

❻ Garbage collections

Number of times ACMS attempted to use fragmented pool space.

❼ Control pool

Control pool information for the application, whose size is controlled by the ACMSGEN parameter WSC_POOLSIZE.

❽ Workspace pool

Workspace pool information for the application, whose size is controlled by the ACMSGEN parameter WS_POOLSIZE.

❾ TEST_GRP01

Name of the task group for which pool information is displayed.

❿ Control pool

Control pool information for the task group, whose size is controlled by the ACMSGEN parameter TWSC_POOLSIZE.

⓫ Workspace pool

Workspace pool information for the task group, whose size is controlled by the ACMSGEN parameter TWS_POOLSIZE.

Use the information in the pool display to determine the correct sizes for the ACMSGEN parameters for control and workspace pools. See *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"* for more information.

9.5.2. Displaying Dynamic Information

Dynamically display information about a single application by using the **ACMS/SHOW APPLICATION/CONTINUOUS** command. **ACMS/SHOW APPLICATION/CONTINUOUS** command allows you to:

- Specify how often you want an application's statistics refreshed.
- Specify when you want the display to begin.
- Specify when you want the display to end.
- Name a file where you want the SHOW output written.

When you specify the **ACMS/SHOW APPLICATION/CONTINUOUS** command, specify the file name of a started application. If you do not specify an application name, ACMS returns an error. Specify only the file name; do not include device, directory, or file type. You cannot specify more than one application name with the **ACMS/SHOW APPLICATION/CONTINUOUS** command. *Example 9.3, "*ACMS/SHOW APPLICATION/CONTINUOUS *Command"* displays dynamic information about the application STORAGE.

Example 9.3. ACMS/SHOW APPLICATION/CONTINUOUS Command

```
$ ACMS/SHOW APPLICATION/CONTINUOUS STORAGE

  ACMS V4.0       ACMS CONTINUOUS APPLICATION MONITOR   NODE::MYNODE
                                      1-MAY-1994 07:52:04.62
  ❶ Name:    STORAGE
  ❷ Process: ACMS01EXC015000
  ❸ User: ACMS$EXC                                  ❹ PID:  22E00563
  ❺ Max Tasks: 65535                                ❻ Max SPs:   22
  ❼ Cur Tasks: 15                                   ❽ Cur SPs:   13

  ❾                       ❿          ⓫       ⓬     ⓭        ⓮

  SERVER NAME         Min SP/Max SP Current Average Minimum Maximum

  TESTSRV01                3/3
  Active Servers                      0       0       0       1
  Free Servers                        3       1       0       3
  Waiting Tasks                       0       2       0       28

  TLOAD001S                3/3
  Active Servers                      2       1       0       3
  Free Servers                        1       1       0       3
  Waiting Tasks                       0       12      0       92
```

You can control the video display by using the control and arrow keys. Press **Ctrl/C**, **Ctrl/Y**, or **Ctrl/Z** to terminate the display. Press **Ctrl/W** to refresh the screen. The up and down arrow keys scroll the screen forward and backward.

The following is a description of the numbered items in *Example 9.3, "*ACMS/SHOW APPLICATION/CONTINUOUS *Command"*:

❶ Name

Name of the application.

❷ Process

Name of the process.

❸ User

OpenVMS user name for the application.

❹ PID

Process ID for the application.

❺ Max Tasks

Maximum number of task instances allowed for the application.

❻ Max SPs

Maximum number of server processes allowed for the application.

❼ Cur Tasks

Current number of active tasks in the application.

❽ Cur SPs

Current number of started server processes in the application.

❾ SERVER NAME

List of the names assigned in SERVER clauses in the application definition. Each row of the display contains information about server processes, and information about tasks waiting for those server processes.

❿ Min SP/Max SP

Minimum number of server processes and maximum number of server processes allowed for this server.

⓫ Current

Current number of processes started for this server.

⓬ Average

Average number of processes for this server.

⓭ Minimum

Minimum number of processes for this server.

⓮ Maximum

Maximum number of processes for this server.

ACMS refreshes the screen every 30 seconds by default. If you want the screen to refresh at a different interval, specify in seconds the interval you prefer. For example, the following command causes new information for the BOOKSALES application to display on your terminal screen every 300 seconds (5 minutes):

```
$ ACMS/SHOW APPLICATION/CONTINUOUS/INTERVAL=300 BOOKSALES
```

Begin or end a continuous application display with the **/BEGINNING_TIME** and **/ENDING_TIME** qualifiers. Both qualifiers let you specify times in OpenVMS absolute time format, delta time format, or a combination of the two. Refer to *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for information about how to create valid time formats.

There are occasions when having hardcopy records of application information is useful. The **/OUTPUT** qualifier requests ACMS to copy application data to a file you name. Then either display the file at your terminal or print it. If you do not specify a file, ACMS stores information in the file ACMSSHOW.LIS in your current default directory. When you do not use the **/OUTPUT** qualifier, ACMS sends output to the default output device defined by the SYS$OUTPUT logical name.

9.6. Modifying Active Applications

Use the **ACMS/MODIFY APPLICATION** command to modify the application, task, or server attributes of an active application. The attributes you modify are not permanent. If you want a modification to be permanent, you must modify the application definition.

9.6.1. Modifying Application Attributes

Specify the **ACMS/MODIFY APPLICATION** command with the **/APPLICATION_ATTRIBUTES** qualifier to modify the attributes of an active application. Keywords to the **/APPLICATION_ATTRIBUTES** qualifier specify the application attribute you want to modify. For example, the MAX_PROCESS keyword in the following example sets the maximum number of server processes allowed in application AIR_REGISTER to 5:

```
$ ACMS/MODIFY APPLICATION AIR_REGISTER -
_$ /APPLICATION_ATTRIBUTES=MAX_PROCESS=5
Apply Modifications to Application AIR_REGISTER (Y/[N]):
```

Use keywords to the **/APPLICATION_ATTRIBUTES** qualifier to:

- Enable or disable application-level auditing.
- Specify the maximum number of tasks that can execute simultaneously in an application.
- Specify the maximum number of server processes that can be active simultaneously in an application.
- Specify the interval at which ACMS monitors server processes in an application.

When application-level auditing is enabled, the Audit Trail Logger records any application modifications you make in the Audit Trail Log. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for an example of an audit trail record for a modified application.

To display the currently defined attributes for an application, specify the **ACMS/SHOW APPLICATION** command. *Section 9.5.1, "Displaying Static Information"* describes the **ACMS/SHOW APPLICATION** command and provides some sample output.

9.6.2. Modifying Server Attributes

Use the **ACMS/MODIFY APPLICATION** command with the **/SERVER_ATTRIBUTES** qualifier to modify the attributes of a server in an application. Keywords to the **/SERVER_ATTRIBUTES** qualifier specify the server attributes you want to modify.

You can modify the attributes of a particular server in an application, the attributes of all servers in an application, or, if you do not specify an application name, the attributes of all servers in all applications. For example, the NAME and PROCESS_DUMPS keywords in the following example cause ACMS to enable server process dumps for server MYSERV in application SANDAPPL:

```
$ ACMS/MODIFY APPLICATION SANDAPPL -
_$ /SERVER_ATTRIBUTES=(NAME=MYSERV,PROCESS_DUMPS)
Apply Modifications to Application SANDAPPL  (Y/[N]):
```

Use keywords to the **/SERVER_ATTRIBUTES** qualifier to:

- Enable or disable server-level auditing in an application.
- Specify the interval or delay time ACMS waits before creating new server processes.

- Specify the interval or delay time ACMS waits before deleting free server processes.
- Enable or disable server process dumps for an application.
- Specify the maximum number of server processes allowed for an application.
- Specify the minimum number of server processes allowed for an application.

Display currently defined server attributes for an application by specifying the **ACMS/SHOW APPLICATION/SERVER_ATTRIBUTES** command.

When application-level auditing is enabled, the Audit Trail Logger records the modification in the Audit Trail Log file. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for an example of an audit trail record generated by the **ACMS/MODIFY APPLICATION** command.

9.6.3. Modifying Task Attributes

The **ACMS/MODIFY APPLICATION** command with the **/TASK_ATTRIBUTES** qualifier modifies the attributes of tasks in an application. In the following example, the AUDIT keyword to the **/TASK_ATTRIBUTES** qualifier enables task-level auditing for all tasks in the application PARTS:

```
$ ACMS/MODIFY APPLICATION PARTS/TASK_ATTRIBUTES=AUDIT
Apply Modifications to Application PARTS (Y/[N]):
```

Modify the attributes of a specific task or tasks in an application by specifying the keyword NAME with the **/TASK_ATTRIBUTES** qualifier. The following command, for instance, disables tasks BI_MONTHLY and YEARLY in the application PARTS:

```
$ ACMS/MODIFY APPLICATION PARTS -
_$ /TASK_ATTRIBUTES=(NAME=(BI_MONTHLY,YEARLY),DISABLE)
Apply Modifications to Application PARTS (Y/[N]):
```

Use keywords to the **/TASK_ATTRIBUTES** qualifier to:

- Name a task or tasks whose attributes you wish to modify.
- Enable or disable task-level auditing in an application.
- Enable or disable specific tasks in an application.
- Set a transaction timeout interval or disable transaction timeout for a task or tasks.

If you do not specify a task name or names, all tasks are modified within the selected application with whatever attributes you specify.

When application-level auditing is enabled and you modify the attributes of a task, the modifications are recorded in the Audit Trail Log.

9.7. Replacing a Server Image

Use the **ACMS/REPLACE SERVER** command to replace a server image in an active application with a new version of that image. Application availability and task execution are not affected by the server replacement. The **ACMS/REPLACE SERVER** command allows the application manager to dynamically make code changes to the code executed by a procedure server. The application manager can make code changes, relink the server image, place the server image in the location specified by the SERVER IMAGE IS statement in the task group definition, and issue the **ACMS/REPLACE SERVER** command.

The following command, for example, replaces the server image SORT_IMAGE with a new version of that image in the application RULES_REGS. The name of the server image is defined in the application definition.

```
$ ACMS/REPLACE SERVER SORT_IMAGE/APPLICATION=RULES_REGS
Replace Server SORT_IMAGE in Application RULES_REGS (Y/[N]):
```

When the application controller receives the **ACMS/REPLACE SERVER** command, it runs down all free server processes for the specified server and requests all active servers to run down when they are free. A server retaining context does not run down until the context has been released. New server processes are created to meet the minimum and maximum server process requirements of the application. If you attempt to replace an active server image, ACMS replaces it with the new version once it stops executing or is aborted.

If a server image does not stop independently because it contains an infinite loop or some other error, you can force the image to stop. To stop a server image, specify the **ACMS/SHOW SERVER** command to determine the process ID of the server image, and then issue the DCL command **STOP/ID** with the server process ID:

```
$ STOP/ID=22E00563
```

When application-level auditing is enabled and a server is replaced, the Audit Trail Logger records the event in the Audit Trail Log. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for an example of an audit trail record generated by server replacement.

9.8. Maintaining Application Availability

As system manager, ensure that the processing workload is distributed evenly throughout all nodes in a cluster. If a heavier workload is concentrated more on one node in the cluster than on others, use the **ACMS/REPROCESS APPLICATION_SPEC** command to redirect application selections to a node other than the node currently being used. This frees up disk space and memory and allow tasks to execute faster.

The **ACMS/REPROCESS APPLICATION_SPEC** command allows you to take advantage of logical names and search lists to enhance the current ACMS ability to keep applications available in the event of a system failure.

For example, assume that tasks are being selected in an application pointed to by the application specification PAYROLL , and that PAYROLL has been defined as a logical for NODE1::PAYROLL. If PAYROLL is redefined as a logical for NODE2::PAYROLL, and you issue the following command, then all subsequent task selections for PAYROLL are processed on node NODE2 rather than node NODE1.

```
$ ACMS/REPROCESS APPLICATION_SPEC PAYROLL
```

This command is particularly useful to failback to applications when using search lists for application specifications. Search lists can be used for application specifications to provide for automatic failover to one or more backup applications in the event of a system failure. The **ACMS/REPROCESS APPLICATION_SPEC** command can be used to failback to the original application when it becomes available. See *Chapter 6, "Using Distributed Forms Processing"* for more information on using search lists in application specifications.

9.9. Canceling Tasks

There are several situations in which it might be necessary to cancel a task. Cancel one or more tasks when:

- You want to cancel all tasks in an application before stopping the application.
- The operator wants to cancel a user who has active tasks.
- A task is not executing properly.

To stop either an application or the ACMS system and cancel all active tasks, include a **/CANCEL** qualifier in the **ACMS/STOP SYSTEM** or **ACMS/STOP APPLICATION** command. The **/CANCEL** qualifier always interrupts any active tasks or users in the system or the application being stopped.

To cancel a task without stopping the ACMS system or application, use the **ACMS/CANCEL TASK** command. This command results in a non-recoverable exception. However, in distributed transactions the effect of the **ACMS/CANCEL TASKL** command depends upon the task state:

- If the task is not composed (not participating in a distributed transaction started by a parent task or an agent), ACMS always attempts to abort an active DECdtm transaction.
- If a composed task is executing at the time of the cancel, ACMS cancels the task and returns control to the parent task or agent. An exception is returned to the parent task, or the cancel reason is returned to the agent. The parent task or the agent has responsibility for aborting the transaction.

See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for complete information about task cancellation and exception handling.

When you use this command without a task name or qualifiers, the command affects all active tasks on the local node, including tasks called by other tasks. By default, ACMS prompts you to confirm the cancellation before canceling a task. However, if you use the **/NOCONFIRM** qualifier, ACMS cancels all tasks without prompting for confirmation. In either case, include the **/LOG** qualifier with the **ACMS/CANCEL TASKL** command. The **/LOG** qualifier displays a message confirming each successful cancellation.

The following command cancels MARKET_TASK1 but not MARKET_TASK2:

```
$ ACMS/CANCEL TASK
Task Name: MARKET_TASK1   Task ID:      CARAT::0001000D-00000001
 Application:  MARKET_APPL                    User Name:    SAMPLE1
 Submitter ID: CARAT::0001000D                Device:       TTB1:  Task
 ID:        CARAT::0001000D-00000001 (Y/[N]):Y  Task Name: MARKET_TASK2
   Task ID:      CARAT::00020013-00000001          Application:
 MARKET_APPL                      User Name:    SAMPLE2   Submitter ID:
 CARAT::00020013                  Device:       TTH0:  Task ID:
 CARAT::00020013-00000001 [Y/[N]]:N
```

Other qualifiers available with the **ACMS/CANCEL TASKL** command let you identify which task to cancel by one of several characteristics such as task name or user name. See the description of the **ACMS/CANCEL TASKL** command in *Chapter 21, "Operator Commands"* for a description of these qualifiers.

9.10. Displaying Task Information

The **ACMS/SHOW TASK** command displays information about ACMS tasks running on your node. You can display information about tasks that are selected by a local or a remote submitter. You can include one or more task names as parameters. If you include more than one task name, separate the task names with commas. If you do not include a parameter, ACMS displays information about

all active tasks. *Example 9.4, "ACMS/SHOW TASK Command"* shows some sample output from the **ACMS/SHOW TASK** command. Because no task name is specified, ACMS displays information about all active tasks.

Example 9.4. ACMS/SHOW TASK Command

```
$ ACMS/SHOW TASK
  ACMS V4.0   CURRENT TASKS        Time:  1-MAY-1994 20:33:14.93
  ❶
  Task Name: PERS_ADD_TASK
    ❷  State:        Active; Executing PROCESSING step WORK
    ❸  Step label:   $STEP_1
    ❹  Task ID:      ALLDAY::00010016-0000002
    ❺  Application:  PERS                    ❻  User Name:   SWEET
    ❼  Submitter ID: ALLDAY::00010016        ❽  Device:      TTB4:
    ❾  Called Task:  PERS_CALLED_TASK
      State:      Active, executing BLOCK step WORK
      Step label: $STEP_2
    ❿    Server(s):  PERS_SERVER             Executing, PID 0200010B
    ⓫    TID:        0012000B-0120-0260-0006-0000050002101
    Task ID:    ALLDAY::00010016-00000002-00000001
```

The following describes the numbered items in *Example 9.4, "ACMS/SHOW TASK Command"*:

❶ Task Name

Name of any task the user is running. The task name is the name defined for the task in the task group definition.

❷ State

Each task exists in one of these states: Starting, Active, Finishing, Completed, Processing Exception, and Cancelling. The Active, Completed, Processing Exception, and Cancelling states each have variations. See *Table 9.1, "Task States"* for a complete list and description of the task states.

❸ Step label

Current step label. **SHOW TASK** only displays the step label line if the task is within a step.

❹ Task ID

ACMS task identification code. The task ID uniquely identifies a task instance.

❺ Application

Name of the application in which the task is running.

❻ User Name

User name of the task submitter. The user name is the proxy user name when the submitter selects tasks from a remote ACMS system.

❼ Submitter ID

ACMS task submitter identification code assigned to the task at sign-in. The node field in the submitter ID lets you distinguish between local and remote submitters.

❽ Device

ACMS login device of the task submitter. All remote task submitters are signed in with the null device (NL).

❾ Called Task

Name of the called task.

❿ Server(s)

List of the servers the task is using. A task can be executing in a server, retaining a server, or waiting for a server, or any combination of these three. For tasks executing in or retaining a server, the process identification number (PID) is supplied. For tasks waiting for a server, the number of seconds for which it has been waiting is supplied. **`SHOW TASK`** only displays the list of servers if the task is currently executing in a server, retaining a server, or waiting for a server.

⓫ TID (DECdtm transaction identification number)

TID associated with the task. The TID is displayed only for a task containing a distributed transaction, and only if it hasn't already been displayed for the task.

Table 9.1. Task States

State	Description
Starting	Task state while EXC initializes a task instance. Task initialization includes writing a "task start" record to the audit trail log.
Active	Task state when a task is currently executing, is not processing an exception, and has not been cancelled. Additional information further specifies the task state in active status.
Active; Executing BLOCK step WORK	The task is executing the work part of a block step. Since the work part of a block step involves executing the nested processing, exchange, and subordinate nested block steps within the block, then a task only maintains this state while ACMS initializes the block step.
Active; Executing BLOCK step ACTION	The task is executing the action part of a block step.
Active; Executing BLOCK step ACTION, Committing Transaction	The task is waiting for notification from DECdtm to commit the transaction as the second step in the 2-phase commit process.
Active; Executing BLOCK step ACTION, Aborting Transaction	The task is waiting for notification from DECdtm to abort the transaction.
Active; Executing PROCESSING step WORK	The task is calling a step procedure in a procedure server, executing a command in a DCL server, or calling another task.
Active; Executing PROCESSING step ACTION	The task is executing the action part of a processing step.

State	Description
Active; Executing PROCESSING step ACTION, Committing Transaction	The task is waiting for notification from DECdtm to commit the transaction as the second step in the 2-phase commit process.
Active; Executing PROCESSING step ACTION, Aborting Transaction	The task is waiting for notification from DECdtm to abort the transaction.
Active; Executing EXCHANGE step WORK	The task is calling a DECforms form, a TDMS request, or performing stream I/O.
Active; Executing EXCHANGE step ACTION	The task is executing the action part of an exchange step.
Finishing	The task has finished execution and ACMS is completing the task. Task termination processing includes writing a "task end " record to the ACMS Audit Trail Logger.
Completed	A task enters a completed state when it has executed the last step in the task definition and is waiting for a parent task or an agent, such as the QTI, to end or abort the DECdtm transaction in which the task participated. When the transaction completes, EXC frees the servers and ends the task. Additional information further specifies the task state in completed status.
Completed; Waiting to Prepare	A composed task has completed, but awaits the end of the transaction. ACMS is waiting to receive a prepare message from DECdtm services as the first step in the 2-phase commit process.
Completed; Waiting to Commit	A composed task has ended and is stalled pending the end of the transaction. ACMS is wating to receive a commit message from DECdtm as the second step in the 2-phase commit process.
Completed; Waiting for End of Transaction	A non-composed task has completed, but awaits the end of the transaction. ACMS is waiting for DECdtm to complete the 2-phase commit process.
Processing Exception	A task is processing an exception if it is actively performing the operations necessary to handle a step exception or a transaction exception. Additional information further specifies the task state in processing exception status.
Processing Exception; Cancelling an EXCHANGE step	The task is waiting for an exchange step to be cancelled before the exception handling sequence can continue.
Processing Exception; Cancelling a PROCESSING step	The task is waiting for a processing step to be cancelled before the exception handling sequence can continue.
Processing Exception; Aborting a transaction	ACMS is aborting a DECdtm transaction as part of the exception handling sequence.

State	Description
Processing Exception; Calling server cancel procedure(s)	ACMS is calling one or more server cancel procedures as part of the exception handling sequence.
Processing Exception; Blocked, Waiting to Commit or Abort	The task is associated with a blocked transaction. The task remains in this stalled state until communication is reestablished with the transaction coordinator node, or the LMCP Utility or an Rdb or DBMS utility is used to manually resolve the state of the transaction.
Cancelling	A task is cancelling if it is actively performing the operations necessary to cancel the task following a nonrecoverable exception. Additional information further specifies the task state in cancelling status.
Cancelling; Cancelling an EXCHANGE step	The task is waiting for an exchange step to be cancelled before the processing sequence can continue.
Cancelling; Cancelling a PROCESSING step	The task is waiting for a processing step to be cancelled before the processing sequence can continue.
Cancelling; Aborting a transaction	ACMS is aborting a DECdtm transaction as part of the cancel processing sequence.
Cancelling; Calling server cancel procedure(s)	ACMS is calling one or more server cancel procedures as part of the cancel processing sequence.
Cancelling; Auditing task cancel information	ACMS is writing details about the task cancellation to the ACMS Audit Trail Log.
Cancelling; BLOCKED, Waiting to Commit or Abort	The task is associated with a blocked transaction. The task remains in this stalled state until communication is reestablished with the transaction coordinator node, or the LMCP Utility or an Rdb or DBMS utility is used to manually resolve the state of the transaction.
Cancelling; Executing task cancel action	The task is executing the cancel action phrase of the task definition.

The **/APPLICATION** qualifier lets you restrict the search ACMS makes to find a task. When you name an application with the **/APPLICATION** qualifier, ACMS searches for the tasks you name in the application you specify. The application name is the file name of the application. Do not include the device, directory, or the file type. For example:

```
$ ACMS/SHOW TASK BASIC/APPLICATION=PAYROLL
```

This command causes ACMS to search only for the task BASIC in the application PAYROLL.

To get a list of all tasks in an application, name an application with the **/APPLICATION** qualifier but do not name any tasks. The following command displays information on all active tasks in the application DEBTS:

```
$ ACMS/SHOW TASK/APPLICATION=DEBTS
```

Display the tasks running at a specific terminal by using the **/DEVICE** qualifier. The device name you specify must end with a colon (:). You can also name the null device (NL:) to display information on all remote submitter tasks. For example, the following command displays all tasks running at terminal TTF0:

```
$ ACMS/SHOW TASK/DEVICE=TTF0:
```

Include the **/USER** qualifier with the **ACMS/SHOW TASK** command to identify all tasks being run by a specific user. For example, the following command displays all tasks being run by user KURASOWA:

```
$ ACMS/SHOW TASK/USER=KURASOWA
```

The **/IDENTIFIER** and **/SUBMITTER** qualifiers allow you to display information about particular task instances. The **/IDENTIFIER** qualifier displays information about tasks by ACMS identification code, which is assigned to each task a user selects. Use the **/IDENTIFIER** qualifier to display information about a single task or about a task called by another task.

The **/SUBMITTER** qualifier displays tasks by submitter identification code, which is also assigned to each user who signs in to ACMS. Refer to *Section 12.6.1, "Selecting Records by Submitter and Task Identification Code"* for information on submitter and task identification codes.

When you specify a node name with the **/SUBMITTER** qualifier but do not specify a task name, ACMS displays all active tasks submitted from that node. For example:

```
$ ACMS/SHOW TASK/SUBMITTER=WONDER::
```

Include double colons (::) when specifying a node name.

9.11. Directing TDMS Hardcopy

You can use the ACMS$TSS_HARDCOPY shareable logical name table to direct output from the TDMS hardcopy key (PF4 by default) on a per-user basis.

Normally when you press the hardcopy key while executing a TDMS request, the contents of the current form are copied to a file defined by the TSS$HARDCOPY logical name. However, if you define the ACMS$TSS_HARDCOPY shareable logical name table, you can copy form contents to different files.

ACMS allows you to define multiple locations for different users form outputs by defining a logical name table of user and device names. To specify different hardcopy locations on a per-user basis, define the ACMS$TSS_HARDCOPY shareable logical name table under the system directory name table (LNM$SYSTEM_DIRECTORY). Then define logical names in the ACMS$TSS_HARDCOPY table that specify where the contents of the form are to be copied when you press the hardcopy key.

Logical names in the name table can be either user names or physical device names. When determining where a copy of a form is to be sent, ACMS first translates the device name and then translates the user name.

To define a hardcopy location for a user name, define a logical name for the user name that equates to the name of the file where you wish a copy of the form to be sent. Similarly, for a device name, define a logical name for the physical device name (without any leading underscore or trailing colon). For example:

```
$ CREATE/NAME_TABLE ACMS$TSS_HARDCOPY/PARENT:LNM$SYSTEM_DIRECTORY
$ DEFINE/TABLE=ACMS$TSS_HARDCOPY SMITH DISK$:[DIRECTORY]SMITH.TXT
$ DEFINE/TABLE=ACMS$TSS_HARDCOPY TTA5 DISK$:[DIRECTORY]TERMINAL1.TXT
```

When user SMITH presses the hardcopy key, a copy of the current form is placed in the file SMITH.TXT. Similarly, when the person using terminal TTA5 presses the hardcopy key, a copy of the current form is placed in the file TERMINAL1.TXT. If user SMITH is logged into terminal TTA5 then his form is copied to TERMINAL1.TXT instead of SMITH.TXT.

ACMS translates hardcopy locations when the user signs in. If you define a new location for a particular user or device, the user must sign out of ACMS and then sign back in. The logical name table on the submitter node is used to translate a hardcopy location for the user.

See the TDMS documentation for further information on the TSS$HARDCOPY logical name and the hardcopy key.

Chapter 10. Setting ACMS Quotas, Parameters, and Privileges

This chapter describes the ACMS command procedures ACMSPARAM.COM and ACMEXCPAR.COM which you can use to set ACMS system parameters and process quotas. It also describes the variables used as input to ACMSPARAM.COM and ACMEXCPAR.COM, and how to gather and supply variable values to the command procedures through user prompts, the ACMS monitor, and the ACMVARINI.DAT initialization file.

10.1. Introduction

ACMS provides two command procedures to determine ACMS quotas and parameters after an installation or upgrade, or when you want to tune your ACMS system to reflect a changed workload.

- SYS$MANAGER:ACMSPARAM.COM

  This command procedure automates the task of modifying OpenVMS system parameters, ACMS system parameters, and ACMS run-time process quotas.

- SYS$MANAGER:ACMEXCPAR.COM.

  This command procedure modifies Application Execution Controller (EXC) quotas.

These command procedures let you change ACMS parameters in much the same way that the OpenVMS AUTOGEN Utility lets you change OpenVMS system parameters.

ACMS also provides ACMSGEN as a parallel to the OpenVMS SYSGEN Utility for adjustments to ACMS system parameters (see *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"*). However, perform such adjustments using ACMSPARAM.COM and ACMEXCPAR.COM rather than ACMSGEN, because the command procedures automatically modify any other parameters that relate to the changed parameters.

Run ACMSPARAM.COM and ACMEXCPAR.COM whenever a change occurs that could affect any parameters or quotas needed by ACMS. Such changes include, but are not limited to, the following:

- Installation of a new version of ACMS.
- Movement of an application from a development node to a production node.
- Addition of users to the ACMS system.
- Addition of an application to the ACMS system.
- Notification by the Software Event Log Utility Program (SWLUP) that a parameter has been exceeded.
- Change in the number of task queues, Queued Task Initiator (QTI) submitters, or task threads per queue.
- Warning from the ACMS monitor that quotas are in danger of being exceeded.

If you do not use ACMSPARAM.COM and ACMEXCPAR.COM, ACMS uses default values for the required quotas and parameters.

Also, although the two command procedures automate the calculation of parameters and quotas, you may still need to make some calculations on your own:

- The two command procedures do not set all of the OpenVMS system parameters required by your ACMS system. There are some OpenVMS system modifications that you might have to perform using OpenVMS AUTOGEN. See *VSI OpenVMS System Manager's Manual, Volume 1: Essentials* [https://docs.vmssoftware.com/vsi-openvms-system-manager-s-manual-volume-1-essentials/] for details of the AUTOGEN Utility and its commands.

- The command procedure calculations may provide only rough approximations for some parameters and quotas based on variable calculations. To fine-tune your system even further, you may want to calculate the variables yourself, based on your particular system. Then include the variable values in the input files to the two command procedures and run the procedures. See *Appendix A, "Parameter and Quota Calculations"* for a description of how the ACMSPARAM.COM and ACMEXCPAR.COM determine these values, and how you can determine alternate values for use by the command procedures.

10.2. Calculating Parameters and Quotas with ACMSPARAM.COM

The ACMSPARAM.COM command procedure performs these operations:

- Generates default values for all variables that are used to calculate ACMS system parameters (if values do not already exist).

- Calculates values for OpenVMS system parameters that are affected by ACMS.

- Calculates ACMS system parameters.

- Calculates quotas for the user names under which the ACMS Command Process (CP), ACMS Central Controller (ACC), Terminal Subsystem Controller (TSC), and QTI execute. ACMSPARAM.COM also adds accounts and assigns privileges for these user names in the SYS$SYSTEM:SYSUAF.DAT file.

- Writes the OpenVMS system parameters that need modification to a file. ACMSPARAM.COM gives you the option of automatically updating the OpenVMS AUTOGEN input file MODPARAMS.DAT with values it generates.

10.2.1. Running ACMSPARAM.COM

ACMSPARAM.COM accepts variable values from user input, the ACMS monitor, or the ACMVARINI.DAT initialization file to set OpenVMS and ACMS system parameters and ACMS process quotas. ACMSPARAM.COM is located in the SYS$MANAGER directory. You need SYSPRV privilege to run it. This section shows how you run ACMSPARAM.COM.

Run ACMSPARAM.COM as follows:

```
$ SET DEFAULT SYS$MANAGER
```

```
$ @ACMSPARAM [phase] [execution-mode]
```

ACMSPARAM.COM consists of three phases. The three phases are:

- GENVAR – Accepts input from the user, the running system, and ACMS database files for calculating OpenVMS and ACMS system parameters and ACMS run-time process quotas.
- GENPAR – Calculates the parameters and quotas and writes them to a file.
- WRITEPAR – Modifies the appropriate ACMS system parameters and process quotas, and puts new values for OpenVMS system parameters in a file. You can choose to have the new OpenVMS system values automatically placed in the AUTOGEN input file, or you can enter them yourself.

The phase parameter can also take the following input:

- ALL – Runs all three phases consecutively. ALL is the default.
- HELP – You can invoke HELP as the first parameter to ACMSPARAM.COM. If you do not specify a second parameter, you receive a help message for the entire ACMSPARAM.COM procedure. Specify HELP as the first parameter to ACMSPARAM.COM, followed by the name of a single phase as a second parameter to get a help message for that phase only. For example, for help on the GENPAR phase, specify:

  ```
  $ @ACMSPARAM HELP GENPAR
  ```

  You can also get help for a particular variable by specifying the variable name as the second parameter. For example, to get help for the REMOTE_AGENT_CNT variable, specify:

  ```
  $ @ACMSPARAM HELP REMOTE_AGENT_CNT
  ```

ACMSPARAM.COM runs in one of two execution modes:

- INITIAL mode – Prompts for user input for variables used in calculations.
- FEEDBACK mode – Gathers information from the running ACMS system for variables used in calculations. FEEDBACK mode is the default.

In either INITIAL or FEEDBACK mode, ACMSPARAM.COM also gathers information from the ACMS database files for use in calculations.

Figure 10.1, "Setting System Parameters and Process Quotas with ACMSPARAM.COM" illustrates the interaction of the three phases of ACMSPARAM.COM. This section describes the details of the three phases of ACMSPARAM.COM.

Before running ACMSPARAM.COM, make sure that all logicals used in application and task definitions and all logicals used to specify the MDB for each user in ACMSUDF.DAT are defined. Otherwise, the procedure may fail.

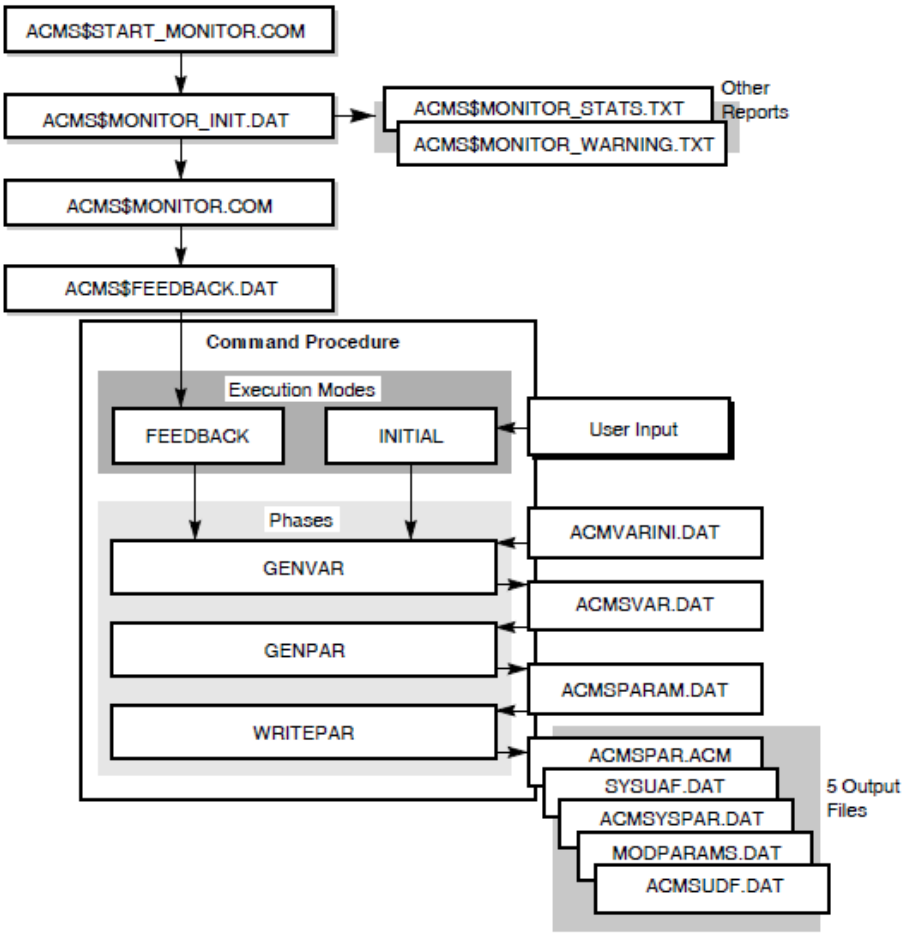
You can run the entire command procedure or run the phases separately. You will usually want to run the entire command procedure at one time. However, sometimes you may want to run the phases one at a time and check the results before proceeding. For example, you may want to run the phases separately for the following reasons:

- To change intermediate values so that you can increase quotas to allow the application to grow over time without stopping the application.

- If you use task-call-task, after running the GENVAR phase, multiply the value for the TOTAL_TK_INSTANCE_CNT variable by the maximum task-call-task depth to get an accurate value for that variable.

The three phases are described in the following sections and summarized in *Table 10.1, "Phases of ACMSPARAM.COM"*.

Figure 10.1. Setting System Parameters and Process Quotas with ACMSPARAM.COM



10.2.1.1. GENVAR Phase of ACMSPARAM.COM

The GENVAR phase creates variables based on values that are supplied as follows:

- By the user, for INITIAL mode.

  Run ACMSPARAM.COM in INITIAL mode after installing or upgrading your ACMS system, or at any other time when your system has not had time to experience a typical workload, for example, when you add a new application or new users. When you use INITIAL mode, the command procedure prompts you for the following variables, if they are not specified in the initialization file ACMVARINI.DAT:

  APPL_NAME
  REMOTE_APPL_NAME
  REMOTE_NODE_CNT
  REMOTE_SUB_CNT
  TERMINAL_CNT

TERMINAL_PER_CP
QTI_TASK_THDS
QTI_QUEUES
QTI_SUBMITTERS

- By the ACMS$MONITOR.COM command procedure, for FEEDBACK mode.

  Run ACMSPARAM.COM in FEEDBACK mode when:

  - ACMS has run long enough to let the ACMS$MONITOR.COM command procedure monitor an average workload.
  - The ACMS Software Event Log Utility Program (SWLUP) informs you that a parameter was exceeded.
  - ACMS$MONITOR.COM issues a warning that a parameter or quota is in danger of being exceeded.

  FEEDBACK mode uses the data about the running system that was collected by the ACMS$MONITOR.COM procedure, thereby assuring accurate input for parameter and quota calculations for your specific system.

  See *Section 10.2.2.1, "Supplying Variables with ACMS$MONITOR.COM"* for details about running the monitor procedure.

  ACMS$MONITOR.COM returns values to ACMS$FEEDBACK.DAT for the same variables for which INITIAL mode prompts, as well as for the following variables:

  ADB_BLKS
  APPL_CNT
  REMOTE_APPL_CNT

  Table 10.3, "Variables Required for ACMSPARAM.COM" describes each of the variables used in ACMSPARAM.COM.

- By the procedure's reading of .ADB, .TDB, ACMSDDF.DAT, and ACMSUDF.DAT files.
- By editing the ACMVARINI.DAT files.

  Variable values listed in the ACMVARINI.DAT file always take precedence. If you edit ACMVARINI.DAT to include a variable value, ACMSPARAM.COM uses that value as follows:

  - If you use INITIAL mode and ACMVARINI.DAT contains a value for a variable for which INITIAL mode can prompt, INITIAL mode does not prompt for that value.
  - If you use FEEDBACK mode and ACMVARINI.DAT contains a value for a variable for which the ACMS monitor can gather information, the command procedure ignores the information gathered by the monitor for that variable.
  - If ACMVARINI.DAT contains any variable values that can be read by the command procedure from .ADB, .TDB, ACMSDDF.DAT, and ACMSUDF.DAT files, the command procedure uses the values in ACMVARINI.DAT.

Section 10.2.2, "Supplying Variable Values for ACMSPARAM.COM" describes in detail how to gather the information needed as variable input to ACMSPARAM.COM.

GENVAR places the variable values in ACMSVAR.DAT, the output file for the GENVAR phase.

10.2.1.2. GENPAR Phase of ACMSPARAM.COM

At the beginning of the GENPAR phase, ACMS displays a message explaining the security implications of having multiple accounts with the same UIC. You are then prompted for a unique UIC for each account. If the specified UIC is not a system UIC, the account is granted SYSPRV privilege. The GENPAR phase also takes the variables passed to ACMSVAR.DAT and calculates the system parameters and process quotas needed by the ACMS system. *Table 10.3, "Variables Required for ACMSPARAM.COM"* describes these variables and the parameters and quotas calculated from the variables. *Appendix A, "Parameter and Quota Calculations"* describes the calculations of several variables that you may want to calculate yourself and provide to ACMSPARAM.COM for even more accurate parameter and quota settings.

10.2.1.3. WRITEPAR Phase of ACMSPARAM.COM

ACMSPARAM.COM calculates values for the OpenVMS SYSGEN parameters affected by ACMS. Those OpenVMS SYSGEN parameters are:

CHANNELCNT
GBLPAGES
GBLPAGFIL
GBLSECTIONS
LOCKIDTBL
VIRTUALPAGECNT

ACMSPARAM.COM also calculates the following OpenVMS SYSGEN parameters, which are used when ACMS creates subprocesses:

PQL_DASTLM
PQL_DBIOLM
PQL_DDIOLM
PQL_DWSEXTENT
PQL_DWSQUOTA

The WRITEPAR phase of ACMSPARAM.COM modifies the ACMS system parameter file and the system user authorization file, sets any ACMSGEN parameters specified, and displays SYS$MANAGER:ACMSYSPAR.DAT. ACMSYSPAR.DAT lists the OpenVMS system parameters that need modification. WRITEPAR allows you to update automatically the AUTOGEN input file SYS$SYSTEM:MODPARAMS.DAT.

ACMSPARAM.COM then reminds you to run AUTOGEN and reboot the system. If you choose not to have ACMSPARAM.COM update MODPARAMS.DAT, ACMSPARAM.COM reminds you to update MODPARAMS.DAT, run AUTOGEN, and reboot the system.

Edit the appended MODPARAMS.DAT before running SYSGEN to combine any duplicate `ADD_<system_parameter>` statements. ACMSPARAM.COM does not do this automatically. To ensure that this action takes place, the following informational message is displayed:

```
Remember to check the new SYS$SYSTEM:MODPARAMS.DAT to resolve any duplicate
 ADD_parameter entries that occurred due to the appending  of ACMSYSPAR.DAT
 to MODPARAMS.DAT.
```

If an account for an ACMS process is created during the WRITEPAR phase, the procedure prompts the user for an account password and unique UIC. The password for the account must be 8 or more characters, cannot contain the name of the ACMS product, and should not be an easily guessed word. To protect against typing errors that are not seen when entering the password, users must reenter the

password to verify it. Users have three chances to verify the password. Valid characters for a password are: A through Z, a through z, 0 through 9, $ (dollar sign), and _ (underscore).

See *Appendix A, "Parameter and Quota Calculations"* for the formulas for calculating these OpenVMS system parameter values. Refer to *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"* for information about how these OpenVMS system parameters affect ACMS components.

Remember, you must reboot your OpenVMS system after you change the values of any nondynamic OpenVMS SYSGEN parameters.

Table 10.1. Phases of ACMSPARAM.COM

Phase	Description
GENVAR	
Input file	SYS$MANAGER:ACMVARINI.DAT (if available), ACMS$FEEDBACK.DAT (if using FEEDBACK mode), user input (if using INITIAL mode)
Output file	SYS$MANAGER:ACMSVAR.DAT
Function	GENVAR writes the variables provided by INITIAL or FEEDBACK mode, or by ACMVARINI.DAT, to the ACMSVAR.DAT file. If the ACMVARINI.DAT file does not exist, you can run GENVAR by itself to create a template for ACMVARINI.DAT. GENVAR sets defaults for any variables not set by INITIAL or FEEDBACK mode, or not specified by editing ACMVARINI.DAT. GENVAR overrides the defaults for any variables collected by INITIAL or FEEDBACK mode, or specified in ACMVARINI.DAT. Any variables edited directly in ACMVARINI.DAT override any values collected by INITIAL or FEEDBACK modes.
GENPAR	
Input file	SYS$MANAGER:ACMSVAR.DAT
Output file	SYS$MANAGER:ACMSPARAM.DAT
Function	GENPAR performs the second phase of the ACMSPARAM.COM procedure. GENPAR calculates parameter values for the ACMS system. First, GENPAR reads variable values from the ACMSVAR.DAT file and calculates the system parameter values. Then it calculates the user name quotas for the ACC, the TSC, the CP, and the QTI. Finally, GENPAR writes the calculated parameters and quotas to the ACMSPARAM.DAT file.
WRITEPAR	
Input file	SYS$MANAGER:ACMSPARAM.DAT
Output Files	SYS$SYSTEM:ACMSPAR.ACM SYS$SYSTEM:SYSUAF.DAT SYS$MANAGER:ACMSYSPAR.DAT SYS$SYSTEM:MODPARAMS.DAT SYS$SYSTEM:ACMSUDF.DAT

Phase	Description
Function	The WRITEPAR phase is the third phase of the ACMSPARAM.COM procedure. WRITEPAR reads the parameter values from ACMSPARAM.DAT and uses them to: • Modify the ACMS system parameter file (SYS$SYSTEM:ACMSPAR.ACM) • Modify the system user authorization file (SYS$SYSTEM:SYSUAF.DAT) • List for modification the OpenVMS system parameters that need modification in SYS$MANAGER:ACMSYSPAR.DAT. Optionally, update SYS$SYSTEM:MODPARAMS.DAT with the ACMS required values for OpenVMS systems parameters. • Modify the ACMS User Definition file.

ACMSPARAM.COM requires information from a variety of sources to calculate parameters and quotas. The following section describes the sources and means of collecting that information.

10.2.2. Supplying Variable Values for ACMSPARAM.COM

ACMSPARAM.COM requires initial variables to calculate the OpenVMS and ACMS system parameter and process quota values needed to run ACMS efficiently. *Section 10.2.1, "Running ACMSPARAM.COM"* explains how to run ACMSPARAM.COM, including when to use INITIAL or FEEDBACK mode. This section offers more detail on how you and the ACMS system gather the information needed by ACMSPARAM.COM.

The variable values come from two types of sources:

- Fixed information from ACMS files, such as task size, number of controlled terminals, and number of .MDB and .RLB files. This information comes from sources such as .ADB, .TDB, ACMSUDF.DAT, and ACMSDDF.DAT files.

  Note

  ACMSPARAM.COM does not support logical name search lists for TDB file specifications.

  The two ways to supply the information from the ACMS files are:

  - The GENVAR phase of ACMSPARAM.COM obtains information from the ACMS database files, calculates values based on this information, and places variable values into ACMSVAR.DAT. ACMSVAR.DAT is the input file for the GENPAR phase.
  - Create and edit ACMVARINI.DAT to include values that you manually calculate for variables based on the fixed information in ACMS files. Any such variables in ACMVARINI.DAT override values collected from database files in GENVAR.

- Dynamic information from the running ACMS system, such as the number and size of the .ADB files of concurrently running applications on the current or remote nodes, or the number of concurrently active remote and local users. This information comes from the running processes, as well as from .ADB database files.

There are three ways to gather the variables used to calculate the parameter and quota values based on the running ACMS system:

- Run ACMSPARAM.COM in INITIAL mode. ACMSPARAM.COM prompts you for values for any variables related to the running system that are not in ACMVARINI.DAT, the GENVAR input file. See *Section 10.2.1, "Running ACMSPARAM.COM"* for details about running ACMSPARAM.COM in INITIAL mode.
- Run the SYS$MANAGER:ACMS$MONITOR.COM procedure and then run the ACMSPARAM.COM procedure in FEEDBACK mode. ACMS$MONITOR.COM monitors the running ACMS system to collect the most accurate variables, and places the values in ACMS$FEEDBACK.DAT. See *Section 10.2.2.1, "Supplying Variables with ACMS $MONITOR.COM"* for details about the monitor. When you run ACMSPARAM.COM in the default FEEDBACK mode, ACMSPARAM.COM uses any variables in ACMS $FEEDBACK.DAT that do not exist in ACMVARINI.DAT. See *Section 10.2.1, "Running ACMSPARAM.COM"* for details about running ACMSPARAM.COM in FEEDBACK mode.
- Create and edit ACMVARINI.DAT to enter values for the variables based on the running ACMS sytem. Any such variables in ACMVARINI.DAT override the corresponding variable values placed in ACMS$FEEDBACK.DAT for use by the FEEDBACK mode, or gathered by prompts in INITIAL mode.

  Section 10.2.2.2, "Editing ACMVARINI.DAT to Supply Variables to ACMSPARAM.COM" describes the creation, editing, and use of ACMVARINI.DAT.

10.2.2.1. Supplying Variables with ACMS$MONITOR.COM

ACMS$MONITOR.COM periodically examines the running ACMS system and collects current, average, and peak values for ACMS process quotas and ACMS system load. Run ACMS$MONITOR.COM long enough to gather information about the normal workload. It is recommended that the procedure run at least 24 hours to gather accurate information. Then run ACMSPARAM.COM in the default FEEDBACK mode. See *Section 10.2.1, "Running ACMSPARAM.COM"* for details about running ACMSPARAM.COM in FEEDBACK mode.

Run SYS$MANAGER:ACMS$START_MONITOR.COM to initialize and submit ACMS$MONITOR.COM to batch. To run ACMS$START_MONITOR, you must use an account that has the following default privileges: TMPMBX, NETMBX, WORLD, and SYSPRV. It is recommended that you set the CLISYMTBL system parameter to the maximum value with the OpenVMS SYSGEN utility when you run ACMS$MONITOR.COM on your system. ACMS$START_MONITOR.COM prompts you for the batch queue on which ACMS$MONITOR.COM runs. You must enter a queue that is on the current node, because the monitor must run on the same node as the start procedure.

ACMS$START_MONITOR.COM prompts for parameters that determine the configuration of ACMS$MONITOR.COM. After you answer the prompts, ACMS$START_MONITOR.COM displays the user input and asks if you are satisfied. If you are not satisfied with the input, the procedure offers the choice of continuing or quitting. If you continue, the procedure repeats all the questions; otherwise, the procedure ends. Once you are satisfied with the input, ACMS$START_MONITOR.COM writes the answers to SYS$MANAGER:ACMS$MONITOR_INIT.DAT. ACMS$START_MONITOR.COM creates ACMS$MONITOR_INIT.DAT the first time it runs, supplying default answers for the prompts. Thereafter, the values supplied by the user are stored in ACMS$MONITOR_INIT.DAT and become the defaults for the next running of ACMS$START_MONITOR.COM.

ACMS$MONITOR.COM stops automatically at the time specified by the END_TIME parameter. You can stop ACMS$MONITOR.COM before that time by running

SYS$MANAGER:ACMS$STOP_MONITOR.COM, regardless of the END_TIME parameter value. *Table 10.2, "ACMS$START_MONITOR.COM Parameters"* describes the ACMS$START_MONITOR.COM parameters.

Table 10.2. ACMS$START_MONITOR.COM Parameters

Parameter	
INTERVAL	
Description	The sampling interval between data collection events, specified in minutes.
Default	15 minutes
START_TIME	
Description	The time that ACMS$MONITOR begins running, specified as absolute time, delta time, or a combination.
Default	Immediately
END_TIME	
Description	The time that ACMS$MONITOR stops running, specified as absolute time, delta time, or a combination.
Default	The monitor runs until stopped by the user by running ACMS $STOP_MONITOR.COM.
QUEUE	
Description	The batch queue on which ACMS$MONITOR is entered.
Default	*node*$BATCH
REPORT_MAIL_USERNAME	
Description	User name to receive mail containing the parameter/quota warning reports generated by ACMS$MONITOR when ACMS system parameters or process quotas approach the limits set by QUOTA_THRESHOLD and POOL_THRESHOLD.
Default	SYSTEM
REPORT_FREQUENCY	
Description	The interval at which the warning report is mailed: Once every 24 hours (if the threshold was exceeded during the 24 hours) at a time specified by the user, or immediately at every data collection event during which the threshold was exceeded. Enter either DAILY or IMMEDIATELY at the prompt.
Default	IMMEDIATELY
REPORT_SEND_TIME	
Description	The time that the daily report is mailed, if you choose the daily option for REPORT_FREQUENCY. The report is mailed only if any quotas or pools exceeded their thresholds in the previous 24 hours.
Default	08:00
QUOTA_THRESHOLD	

Parameter	
Description	Highest percentage of a quota that can be used before the application manager is notified of a possible resource shortage. The threshold must be an integer between 1 and 100, inclusive.
Default	80
POOL_THRESHOLD	
Description	Highest percentage of used bytes in a pool that can be used before the application manager is notified of a possible resource shortage. The threshold must be an integer between 1 and 100, inclusive.
Default	80

Once ACMS$MONITOR.COM starts, it collects information at the interval specified by ACMS$START_MONITOR.COM in ACMS$MONITOR_INIT.DAT. ACMS$MONITOR.COM stores information in three files:

- SYS$MANAGER:ACMS$FEEDBACK.DAT

  This file contains the information about the running ACMS system for ACMSPARAM.COM, such as the number and size of concurrently running applications, and the number of concurrent local and remote users. This is the same information supplied by the user if you use ACMSPARAM.COM in INITIAL mode. See *Section 10.2.1, "Running ACMSPARAM.COM"* for a full description of this information.

- SYS$MANAGER:ACMS$MONITOR_STATS.TXT

  For each ACMS process, this report provides the following information:

  - Process name, including a string that identifies it as one of the following types: ACC, TSC, QTI, CP, ATL, EXC, SP, ACMS_SWL
  - Process user name
  - Process ID
  - Application name (for EXC)
  - SYSUAF quota name, quota limit, current quota value, used quota percentage, quota usage average, and quota usage peak for these quotas: PRCLM, FILLM, BIOLM, DIOLM, ASTLM, TQLM, ENQLM, BYTLM, PGFLQUOTA, WSEXTENT
  - Workspace pool name, pool size, used bytes, used bytes percentage and average, and the peak bytes used for the task instance and group and user workspace pools: WSC_POOLSIZE, WS_POOLSIZE, TWSC_POOLSIZE, and TWS_POOLSIZE.

  Report supplies the following information for the ACMS message switch shared and process pools:

  - MSS pool name
  - Pool size
  - Current bytes used
  - Used byte percentage

- Average bytes used
- Peak bytes used

The report lists the current, average, and peak:

- Number of remote nodes
- Number of concurrently active applications
- Value for the sum of the sizes of concurrently active applications
- Number of concurrent local users
- Number of concurrent remote users

- SYS$MANAGER:ACMS$MONITOR_WARNING.TXT

  ACMS$MONITOR.COM calculates the pool and quota usage for the ACMS system and application. If the used byte percentage is greater than specified in the POOL_THRESHOLD parameter, the procedure writes the information to the warning report. Similarly, if the quota usage is greater than specified in the QUOTA_THRESHOLD parameter, the procedure issues a warning.

  When ACMS$MONITOR.COM issues a warning report, run ACMSPARAM.COM again to recalculate the system parameters. A warning report is created when:

  - A change to the ACMS system requires that ACMSPARAM.COM be rerun to update the variable information.
  - Pool or quota thresholds are exceeded, even if ACMSPARAM.COM correctly calculated the required values. In this case, if you are sure that the calculation is correct, increase the threshold so that you no longer get reports. If you believe that the calculation is incorrect, increase the parameter or quota manually: use AUTHORIZE to increase a process quota, or specify a higher value for the parameter in ACMVARINI.DAT. Then run all phases of ACMSPARAM.COM. Rerunning ACMSPARAM.COM with higher values may cause other parameters and quotas to be raised. Note that ACMSPARAM.COM never lowers a value for a process quota or an OpenVMS system parameter; however, it may lower an ACMS system parameter.

  If any parameters or quotas are in danger of being exceeded, ACMS$MONITOR.COM mails a report to the user name set in the REPORT_MAIL_USERNAME parameter. The procedure issues the warning report as specified in the REPORT_FREQUENCY parameter of ACMS$START_MONITOR.COM (DAILY or IMMEDIATELY).

  For quotas that exceed QUOTA_THRESHOLD, the following are reported:

  - Process name, process ID, and process user name
  - Quota name
  - Current quota value
  - Quota limit
  - Percentage of quota limit that is used

For pool parameters that exceed POOL_THRESHOLD, the following are reported:

- Process name, process ID, and process user name
- Pool parameter name
- Current poolsize value
- Application name (for EXC processes)
- Poolsize limit
- Percentage of poolsize limit used

10.2.2.2. Editing ACMVARINI.DAT to Supply Variables to ACMSPARAM.COM

Normally, you run ACMSPARAM.COM in INITIAL or FEEDBACK mode to gather variable values for calculating parameters and quotas. If you use INITIAL mode, the variable values for which you are prompted are used directly in GENVAR phase. If you use FEEDBACK mode, the variable values that are stored in ACMS$FEEDBACK.DAT are used by the GENVAR phase.

However, you can create ACMVARINI.DAT and edit in variable values to override values otherwise gathered by INITIAL mode or FEEDBACK mode (or gathered in the GENVAR phase from the ACMS database files). If the ACMVARINI.DAT file does not exist, you can create and modify it by following these steps:

1. On an active ACMS system, set your default to SYS$MANAGER and run the GENVAR phase of ACMSPARAM.COM:

   ```
   $ @ACMSPARAM.COM GENVAR
   ```

   This command creates the file ACMSVAR.DAT that has ACMS default values assigned to all of the variables shown in *Table 10.3, "Variables Required for ACMSPARAM.COM"*. The table contains the variable names and their descriptions.

2. Rename ACMSVAR.DAT, the file containing the variable values, to ACMVARINI.DAT:

   ```
   $ RENAME ACMSVAR.DAT ACMVARINI.DAT
   ```

3. When the GENVAR phase creates the ACMSVAR.DAT file in step 1, it includes all the variables listed in *Table 10.3, "Variables Required for ACMSPARAM.COM"* and generates a default value for each. It is recommended that you delete any variables whose value you do not need to change.

Example 10.1, "Modified Variable Values in the ACMVARINI.DAT File" shows an edited ACMVARINI.DAT file. Each line in the figure contains a new value. All other lines have been deleted. When you edit ACMVARINI.DAT, you can also include variables that map directly to ACMSGEN parameters but are not used by ACMSPARAM.COM to calculate the parameters. The following ACMSGEN parameters are not calculated by ACMSPARAM.COM:

ACC_PRIORITY
TSC_PRIORITY
CP_PRIORITY
QTI_PRIORITY
PERM_CPS

MIN_CPIS
USERNAME_DEFAULT
NODE_NAME
MSS_NET_RETRY_TIMER
QTI_POLLING_TIMER
QTI_SUB_TIMEOUT
QTI_RETRY_TIMER

Although the ACMSPARAM.COM procedure does not need these parameters to perform its calculations, ACMSPARAM.COM propagates these parameters through the GENVAR and GENPAR phases and set them in the WRITEPAR phase.

Example 10.1. Modified Variable Values in the ACMVARINI.DAT File

```
APPL_CNT = 10
TERMINAL_CNT = 64
ADB_BLKS = 48 + 3 + 12 + 9
TDB_CNT = 12 + 2 + 3 + 2
TDB_BLKS = 400+ (15 + 45) + (15 + 45 + 33) + (15 + 27)
CONTROLLED_TERMINAL_CNT = 0
APPL_NAME := payroll
```

Table 10.3, "Variables Required for ACMSPARAM.COM" describes the variables listed in a complete ACMVARINI.DAT file and required by ACMSPARAM.COM. The table lists the SYSGEN parameters and ACMS process quotas whose calculations are affected, in part or in whole, by these variables when used by ACMSPARAM.COM.

Table 10.3, "Variables Required for ACMSPARAM.COM" also lists the ACMSGEN parameters corresponding to the variables in ACMVARINI.DAT. You can set these parameters independently in ACMSGEN. However, it is advisable to use ACMSPARAM.COM to set these parameters, because the command procedure automatically modifies any other parameters relating to the parameters you changed.

For most variables, ACMSPARAM.COM obtains an accurate value from feedback, user answers, or the ACMS database files. However, some variables cannot be calculated automatically, so they are given a reasonable default value which is accurate for an average system. After running the GENVAR phase, check the ACMSVAR.DAT file to verify that the values are accurate for your system. If the defaults do not accurately reflect your system, edit ACMVARINI.DAT and rerun ACMSPARAM.COM. The variables for which neither INITIAL nor FEEDBACK supplies a value are

ACC_USERNAME
AGENT_CNT
CP_USERNAME
CP_PROC_CNT
DBMS_SERVER_CNT
DEBUGGER_CNT
OPERATOR_CNT
REMOTE_AGENT_CNT
QTI_USERNAME
TSC_USERNAME

Table 10.3. Variables Required for ACMSPARAM.COM

Variable
ACC_USERNAME

Variable	
Description	Maps to the ACMSGEN parameter which defines the OpenVMS username of the ACMS Central Controller (ACC). The name must be enclosed in quotes or be assigned the DCL string operator ":=".
Default	ACMS$ACC
Affects	ACMSGEN parameter ACC_USERNAME
	ACC user name entry in the system authorization file
ADB_BLKS	
Description	Total size in blocks of the application database (.ADB) files of applications in use at the same time on the local system.
Default	Feedback data, or total size of .ADB files for applications listed in APPL_NAME.
Affects	SYSGEN parameter GBLPAGES
AGENT_CNT	
Description	Number of agent processes other than the ACMS Command Process (CP) and the QTI running on the local node. This includes the number of ALL-IN-1 processes selecting tasks in ACMS applications, the number of Request Interface (RI) agents, the number of EXCs executing detached tasks, and any customer-supplied agents.
Default	2
Affects	ACMSGEN parameter MSS_MAXOBJ
AGENT_SUB_CNT	
Description	Number of users selecting tasks in ACMS applications from agent processes other than the ACMS Command Process (CP) and the QTI. This includes users selecting tasks in ACMS applications from ALL-IN-1, from Request Interface (RI) agents, and from any customer-supplied agents. This also includes the number of detached tasks executing at any one time.
Default	10
Affects	ACMSGEN parameter MSS_MAXOBJ
APPL_CNT	
Description	Maps to the ACMSGEN parameter which defines the maximum number of applications started on the local system at one time.
Default	Feedback data, or number of applications listed in APPL_NAME
Affects	ACMSGEN parameters MAX_APPL and MSS_MAXOBJ
	SYSGEN parameter GBLSECTIONS
	ACC process quotas FILLM and PGFLQUOTA
APPL_NAME	
Description	Names of the applications started on the local system. Supply the APPL_NAME variable once for each application that will be started on the local system. The application name must be enclosed in quotes or be assigned using the DCL string operator ":=".

Variable	
Default	Feedback data, or names of applications prompted for in INITIAL mode.
Affects	ACMSGEN parameters MAX_APPL and MSS_MAXOBJ
	SYSGEN parameter GBLSECTIONS
	ACC process quotas FILLM and PGFLQUOTA
CONTROLLED_TERMINAL_CNT	
Description	Number of terminals defined as ACMS-controlled in the ACMS Device Definition file (ACMSDDF.DAT).
Default	Number of terminals defined as ACMS-controlled in the ACMS Device Definition file (ACMSDDF.DAT).
Affects	SYSGEN parameter CHANNELCNT
	TSC process quota FILLM
CP_PROC_CNT	
Description	Maps to the ACMSGEN parameter which defines the maximum number of terminal user command processes (CPs) that can be started on the system at one time.
Default	TERMINAL_CNT/TERMINALS_PER_CP
Affects	ACMSGEN parameters CP_SLOTS and MSS_MAXOBJ
	SYSGEN parameter LOCKIDTBL and CHANNELCNT
	TSC process quota TQELM
CP_USERNAME	
Description	Maps to the ACMSGEN parameter which defines the OpenVMS user name of the ACMS Command Process (CP). The name must be enclosed in quotes or be assigned using the DCL string operator ":=".
Default	ACMS$CP
Affects	ACMSGEN parameter CP_USERNAME
	CP user name entry in the system authorization file
DEBUGGER_CNT	
Description	The maximum number of developers debugging task groups at the same time
Default	5
Affects	ACMSGEN parameter MSS_MAXOBJ
	SYSGEN parameters CHANNELCNT, GBLPAGES, GBLPAGFIL, GBLSECTIONS
DEBUG_TDB_BLKS	
Description	Total size in blocks of task group database files (.TDB) that can be debugged by developers at one time.
Default	(Size of largest .TDB * DEBUGGER_CNT)
Affects	SYSGEN parameter GBLPAGES

Variable	
DYN_SP_CNT	
Description	The maximum number of server processes having DYNAMIC USERNAME that can be started on the local system at any one time.
Default	2 * APPL_CNT
Affects	SYSGEN parameter LOCKIDTBL
ENTERED_TERMINAL_CNT	
Description	Total number of terminals signing in to ACMS with **ACMS/ENTER**.
Default	TERMINAL_CNT - CONTROLLED_TERMINAL_CNT
Affects	SYSGEN parameter CHANNELCNT
	TSC process quota TQELM
ESC_RTN_IMAGE_CNT	
Description	Number of all DECforms escape routine images used by all local applications.
Default	5
Affects	SYSGEN parameter CHANNELCNT
	CP process quota FILLM
FORM_BLKS	
Description	The total size in blocks of DECforms form files used by applications started on the local system or accessed remotely at any one time. This includes both .FORM files and .EXE files containing forms. Add the size of a form file once for each different application that refers to it.
Default	Size of .FORM and .EXE form files referred to by local applications, plus the size of .FORM and .EXE form files in ACMS$FORM_CACHE.
Affects	CP process quota PGFLQUOTA
FORM_CNT	
Description	The total number of DECforms form files used by applications started on the local system or accessed remotely at any one time. This includes .FORM files and .EXE files containing forms. Count a form file once for each different application that refers to it.
Default	Number of .FORM and .EXE form files referred to by local applications, plus the number of .FORM and .EXE form files in ACMS$FORM_CACHE.
Affects	SYSGEN parameter CHANNELCNT
	CP process quota FILLM
FORM_TRACE_FILE_CNT	
Description	Number of concurrently active DECforms trace files.
Default	FORM_CNT
Affects	SYSGEN parameter CHANNELCNT
LARGEST_MESSAGE	

Variable	
Description	Size of the largest message sent from an application to the local CP (or other agent) during exchange step processing. LARGEST_MESSAGE differs from MSS_MAXBUF in that it includes only the workspace data portion of the message. If the applications are not distributed, do not use the Request Interface (RI); and use only TDMS request I/O, then LARGEST_MESSAGE is not required.
Default	Largest message used on any exchange step in the application (determined from ADU **`DUMP GROUP`**).
Affects	ACMSGEN parameter MSS_MAXBUF
	CP process quota PGFLQUOTA
LARGEST_MESSAGE_NUM_WKSP	
Description	Number of workspaces passed in the largest remote request message.
Default	Number of workspaces passed in the exchange step with the largest message.
Affects	ACMSGEN parameter MSS_MAXBUF
MDB_BLKS	
Description	Total size (in blocks) of all the different menu database (.MDB) files in use at one time. This includes the default menu database (ACMS.MDB), the ACMS command menu database (ACMSCMD.MDB), and all site-defined menu databases.
Default	Sum of the sizes of all menu databases referred to in the ACMS User Definition file (ACMSUDF.DAT), plus the sizes of ACMS.MDB and ACMSCMD.MDB.
Affects	SYSGEN parameter GBLPAGES
	CP process quota PGFLQUOTA
MDB_CNT	
Description	Total number of all the different menu database (.MDB) files in use at one time. This includes the default menu database (ACMS.MDB), the ACMS command menu database (ACMSCMD.MDB), and all site-defined menu databases.
Default	Number of menu databases referred to in the ACMS User Definition file (ACMSUDF.DAT), plus ACMS.MDB and ACMSCMD.MDB.
Affects	SYSGEN parameter GBLSECTIONS
	ACC process quota FILLM
MSS_MAXBUF	
Description	Maps to the ACMSGEN parameter which defines the largest message that can be sent between ACMS processes without incurring message blocking. Message blocking can have an adverse affect on performance, especially on distributed systems.
Default	Calculated value (see *Appendix A, "Parameter and Quota Calculations"*)
Affects	ACMSGEN parameters MSS_MAXBUF, MSS_POOLSIZE, and MSS_PROCESS_POOL
	ACC, CP, and QTI process quotas BYTLM and PGFLQUOTA

Variable	
MSS_MAXOBJ	
Description	The maximum number of message switch objects that can be created on the system at one time. Message switch objects are used for communications between ACMS processes. There are a number of message switch objects for each ACMS process, plus one message switch object for each ACMS task submitter.
Default	Calculated value (see *Appendix A, "Parameter and Quota Calculations"*)
Affects	ACMSGEN parameter MSS_MAXOBJ and MSS_POOLSIZE
MSS_PROCESS_POOL	
Description	Maps to the ACMSGEN parameter MSS_PROCESS_POOL which defines the size of the communication pool used in each ACMS process. The MSS process pool is used for sending and receiving messages in both local and remote communications. The required value of MSS_PROCESS_POOL depends on the amount of ACMS activity on the system.
Default	Calculated value (see *Appendix A, "Parameter and Quota Calculations"*)
Affects	ACMSGEN parameter MSS_PROCESS_POOL
	ACC, CP, TSC, and QTI process quota PGFLQUOTA
MSS_SHARED_POOL	
Description	Maps to the ACMSGEN parameter MSS_POOLSIZE which defines the size of the MSS shared pool global section. The MSS shared pool is used for sending and receiving messages in local communications. The required value of MSS_POOLSIZE depends on the amount of ACMS activity on the system.
Default	Calculated value (see *Appendix A, "Parameter and Quota Calculations"*)
Affects	ACMSGEN parameter MSS_POOLSIZE
	SYSGEN parameters GBLPAGES and GBLPAGFIL
OPERATOR_CNT	
Description	Number of users issuing ACMS operator commands (such as **ACMS/SHOW**, **ACMS/START**, and so forth) at the same time.
Default	5
Affects	ACMSGEN parameter MSS_POOLSIZE and MSS_MAXOBJ
	ACC process quota ASTLM
OPR_ENTER_RETURN_CNT	
Description	Number of users who entered ACMS using the **ACMS/ENTER/RETURN** command, which is the default command to enter ACMS. In other words, the user did not type **ACMS/ENTER/NORETURN**.
Default	5
Affects	ACMSGEN parameter MSS_MAXOBJ
QTI_MAX_WSP_SIZE	
Description	The largest value associated with the ACMSQUEMGR qualifier **/MAX_WORKSPACES_SIZE** for all queues started on the local system.

Variable	
	QTI_MAX_WSP_SIZE is used to calculate appropriate process quotas for the ACMS Queued Task Initiator (QTI).
Default	Largest value defined for a queue in the ACMS Queue Definition File (ACMSQDF.DAT), or 512 if no queues are defined.
Affects	QTI process quota PGFLQUOTA
QTI_QUEUES	
Description	The maximum number of queues and error queues active on the local system at the same time. QTI_QUEUES is used to calculate appropriate process quotas for the ACMS Queued Task Initiator (QTI).
Default	Total number of queues defined in the ACMS Queue Definition File (ACMSQDF.DAT), or 3 if no queues are defined.
Affects	SYSGEN parameter LOCKIDTBL
	QTI process quotas ASTLM, BYTLM, ENQLM, FILLM, PGFLQUOTA
QTI_SUBMITTERS	
Description	The maximum number of task submitters signed in to ACMS by the ACMS Queued Task Initiator (QTI) at any one time. Set QTI_SUBMITTERS to the maximum number of different user names enqueuing tasks to active queues.
Default	Feedback data, or 10
Affects	ACMSGEN parameter MSS_MAXOBJ
	QTI process quotas ASTLM and PGFLQUOTA
QTI_TASK_THDS	
Description	The maximum number of concurrent active tasks that will be processed by the ACMS Queued Task Initiator (QTI). Set QTI_TASK_THDS to the sum of task threads specified on the **/TASK_THREADS** qualifier for all active queues.
Default	Feedback data or 3
Affects	SYSGEN parameter LOCKIDTBL
	QTI process quotas ASTLM, BIOLM, DIOLM, ENQLM, PGFLQUOTA, TQELM, WSDEFAULT, WSQUOTA, and WSEXTENT
QTI_USERNAME	
Description	Maps to the ACMSGEN parameter which defines the OpenVMS user name of the ACMS Queued Task Initiator (QTI). The name must be enclosed in quotes or be assigned using the DCL string operator ":=".
Default	ACMS$QTI
Affects	ACMSGEN parameter QTI_USERNAME
	QTI user name entry in the system authorization file
REMOTE_AGENT_CNT	
Description	Number of remote agent processes submitting tasks to applications running on the local system at any one time. This includes both ACMS Command Processes

Variable	
	(CPs) and any other agents (RI, ALL-IN-1, user-written) submitting tasks from remote systems.
Default	2 * APPL_CNT
Affects	SYSGEN parameter MSS_PROCESS_POOL
REMOTE_APPL_CNT	
Description	Number of applications running on remote systems in which task submitters on this node select tasks.
Default	Feedback data, or number of remote applications listed in REMOTE_APPL_NAME.
Affects	ACMSGEN parameter MSS_PROCESS_POOL
	ACC process quota ASTLM, FILLM, and PGFLQUOTA; CP process quotas ASTLM, FILLM, BIOLM, and BYTLM; QTI process quotas FILLM and BYTLM
REMOTE_APPL_NAME	
Description	Names of the applications on remote systems in which task submitters on this node select tasks. Supply the REMOTE_APPL_NAME variable once for each application that will be accessed remotely from the local system. Specify applications using the form <node-name>::<application-name>. The name must be enclosed in quotes or be assigned using the DCL string operator ":=".
Default	Feedback date, or user-supplied names of remote applications.
Affects	None directly (used to generate REMOTE_APPL_CNT and REMOTE_NODE_CNT variables)
REMOTE_NODE_CNT	
Description	Number of remote ACMS systems that access the local ACMS system, or are accessed by the local ACMS system. This includes remote systems running applications that are accessed from the local system, and remote systems accessing applications running on the local system.
Default	Feedback data, or number of unique remote node names from REMOTE_APPL_NAME.
Affects	ACC process quotas ASTLM, BYTLM, BIOLM, FILLM, and PGFLQUOTA
REMOTE_RLB_BLKS	
Description	Total size (in blocks) of request library (.RLB) files used by applications accessed remotely from the local system at any one time. Add the size of a request library once for each different remote application that references it.
Default	Feedback data, or the size of .RLB files in ACMS$RLB_CACHE.
Affects	CP process quota PGFLQUOTA
REMOTE_RLB_CNT	
Description	Total number of request library (.RLB) files used by applications accessed remotely from the local system at any one time. Count a request library once for each different remote application that references it.

Variable	
Default	Feedback data, or the number of .RLB files in ACMS$RLB_CACHE.
Affects	SYSGEN parameter CHANNELCNT
	CP process quota FILLM
REMOTE_SUB_CNT	
Description	Number of submitters on remote systems who will be selecting tasks in applications running on the local system.
Default	REMOTE_NODE_CNT * 20
Affects	ACMSGEN parameters WSC_POOLSIZE and WS_POOLSIZE
	SYSGEN parameter CHANNELCNT
	ACC process quotas ASTLM and BYTLM
RLB_CNT	
Description	Total number of request library (.RLB) files used by applications started on the local system at any one time. Count a request library once for each different application that references it (formerly EXC_RLB_CNT)
Default	Number of .RLB files referenced by task groups in local applications (from ADU **`DUMP GROUP`**).
Affects	SYSGEN parameters CHANNELCNT and LOCKIDTBL
TDB_BLKS	
Description	Total size (in blocks) of task group database (.TDB) files used by applications started on the local system. Add the size of a task group database once for each different application that references it.
Default	Sum of sizes of .TDB files referred to by local applications.
Affects	SYSGEN parameter GBLPAGES
TDB_CNT	
Description	Total number of task group database (.TDB) files used by applications started on the local system. Count a task group database once for each different application that refers to it.
Default	Number of .TDB files referred to by local applications (from ADU **`DUMP APPLICATION`**).
Affects	ACMSGEN parameter WSC_POOLSIZE
	SYSGEN parameters CHANNELCNT, GBLPAGES, GBLPAGFIL and GBLSECTIONS
TERMINAL_CNT	
Description	Maps to the ACMSGEN parameter which defines the maximum number of ACMS users that can be signed into ACMS through the terminal subsystem (TSC and CPs) at any one time.
Default	Feedback data, or the number of devices defined in ACMSDDF.DAT if $ALL is not defined, or the number of TT, RT, LT, WT, VT and OP devices on the system.

Variable	
Affects	ACMSGEN parameters MAX_LOGINS, WSC_POOLSIZE, WS_POOLSIZE, CP_SLOTS
	SYSGEN parameter CHANNELCNT
	TSC process quotas ASTLM, BIOLM, BYTLM, PGFLQUOTA, and TQELM
TERMINALS_PER_CP	
Description	Maps to the ACMSGEN parameter which defines the maximum number of terminals handled by one Command Process (CP).
Default	20
Affects	ACMSGEN parameters MAX_TTS_CP, MSS_MAXOBJ, and CP_SLOTS
	SYSGEN parameter CHANNELCNT
	CP process quotas FILLM, DIOLM, BIOLM, BYTLM, ASTLM, ENQLM, PGFLQUOTA, TQELM, WSDEFAULT, WSQUOTA, and WSEXTENT
TOTAL_SP_CNT	
Description	The maximum number of server processes that can be started on the local system at any one time.
Default	Sum of MAXIMUM SERVER PROCESSES from .ADB files, or 5 times the total number of servers defined in local applications (if maximum server process is UNLIMITED).
Affects	ACMSGEN parameter MSS_MAXOBJ
TOTAL_TK_INSTANCE_CNT	
Description	Total number of tasks running concurrently for all applications.
Default	Sum of MAXIMUM TASK INSTANCES from .ADB files.
Affects	ACMSGEN parameters MSS_POOLSIZE, TWS_POOLSIZE, and TWSC_POOLSIZE
TSC_USERNAME	
Description	Maps to the ACMSGEN parameter TSC_USERNAME which defines the OpenVMS user name of the ACMS Terminal Subsystem Controller (TSC). The name must be enclosed in quotes or be assigned using the DCL string operator ":=".
Default	ACMS$TSC
Affects	ACMSGEN parameter TSC_USERNAME
	TSC user name in the system authorization file
TWS_POOLSIZE	
Description	Variable that maps to the ACMSGEN parameter TWS_POOLSIZE which defines the size of pools in which workspaces associated with active task instances are stored. There is one task instance workspace pool for each task group in an application. The required value of TWS_POOLSIZE depends on the number of tasks in each group that will be executing concurrently, and the size of workspaces used by those tasks.

Variable	
Default	Calculated value (see *Appendix A, "Parameter and Quota Calculations"*)
Affects	ACMSGEN parameter TWS_POOLSIZE
	SYSGEN parameters GBLPAGES and GBLPAGFIL
TWSC_POOLSIZE	
Description	Variable that maps to the ACMSGEN parameter TWSC_POOLSIZE which defines the size of pools used for control information for task instance workspaces. There is one control pool for each task instance workspace pool. The required value of TWSC_POOLSIZE depends on the number of tasks in each group that will be executing concurrently, and the number of workspaces used by those tasks.
Default	Calculated value (see *Appendix A, "Parameter and Quota Calculations"*)
Affects	ACMSGEN parameter TWSC_POOLSIZE
	SYSGEN parameters GBLPAGES and GBLPAGFIL
WS_POOLSIZE	
Description	Variable that maps to the ACMSGEN parameter WS_POOLSIZE which defines the size of the pool used for master copies of group and user workspaces. Each application is allocated one group/user workspace pool. The required value of WS_POOLSIZE depends on the number and size of group and user workspaces used by applications.
Default	Calculated value (see *Appendix A, "Parameter and Quota Calculations"*)
Affects	ACMSGEN parameter WS_POOLSIZE
	SYSGEN parameters GBLPAGES and GBLPAGFIL
WSC_POOLSIZE	
Description	Variable that maps to the ACMSGEN parameter WSC_POOLSIZE which defines the size of the pool used for control information for group and user workspaces. There is one control pool for each group/user workspace pool. The required value of WSC_POOLSIZE depends on the number of group and user workspaces used by applications.
Default	Calculated value (see *Appendix A, "Parameter and Quota Calculations"*)
Affects	ACMSGEN parameter WSC_POOLSIZE
	SYSGEN parameters GBLPAGES and GBLPAGFIL

10.3. Calculating EXC Process Quotas with ACMEXCPAR.COM

The ACMEXCPAR.COM procedure performs these operations:

- Ensures that values for all variables necessary to calculate quotas are available in an initialization file created by you or by ACMEXCPAR.COM.
- Reads values from the initialization file.

- Calculates EXC quota values.
- Modifies the system user authorization file SYS$SYSTEM:SYSUAF.DAT using the EXC quota values.

Always run ACMSPARAM.COM before you run ACMEXCPAR.COM. By so doing, ACMEXCPAR.COM uses the correct ACMSGEN parameter values, as set by ACMSPARAM.COM.

10.3.1. Running ACMEXCPAR.COM

ACMEXCPAR.COM accepts initial values from the <application-name>_GENVAR.DAT file, and modifies EXC quotas. ACMEXCPAR.COM is located in the SYS$MANAGER directory. You need the SYSPRV privilege to run it. This section shows how to run ACMEXCPAR.COM.

Run ACMEXCPAR.COM as follows:

```
$ SET DEFAULT SYS$MANAGER
$ @ACMEXCPAR [phase] application-name
```

ACMEXCPAR.COM consists of four phases. You can run the command procedure as a whole, or run each phase independently. The four phases are

- The FINDVAL phase creates a file, <application-name>_GENVAR.DAT, that contains initialization values for the ACMEXCPAR.COM procedure. The <application-name> _GENVAR.DAT file also contains the following ACMSGEN parameters: TWS_POOLSIZE, TWSC_POOLSIZE, WS_POOLSIZE, WSC_POOLSIZE, MSS_MAXBUF, MSS_PROCESS_POOL, and MAX_LOGINS, and the OpenVMS SYSGEN parameter MAXPROCESSCNT.
- The GENVAR phase checks to make sure that all the variables required for the GENPAR phase are in <application-name>_GENPAR.DAT.
- The GENPAR phase prompts you for a unique UIC for each ACMS account and calculates quota values for the EXC.
- The WRITEPAR phase reads the quota values created by the GENPAR phase and uses them to modify the system user authorization file, SYSUAF.DAT.

The phase parameter can also take the following input:

- ALL – Runs all four phases consecutively. ALL is the default.
- CURRENT – Runs the GENVAR, GENPAR, and WRITEPAR phases without running the FINDVAL phase. Use CURRENT when you want to use values previously gathered by FINDVAL, or manually edited in the command procedure's initialization file.
- HELP – You can invoke HELP as the first parameter to ACMEXCPAR.COM. If you do not specify a second parameter, you receive a help message for the entire ACMEXCPAR.COM procedure. Specify HELP as the first parameter to ACMEXCPAR.COM, followed by the name of a single phase as a second parameter to get a help message for that phase only. For example, for help on the GENPAR phase, specify:

  ```
  $ @ACMEXCPAR HELP GENPAR
  ```

  You can also get help for a particular variable by specifying the variable name as the second parameter. For example, to get help for the FORM_CNT variable, specify:

  ```
  $ @ACMEXCPAR HELP FORM_CNT
  ```

You can run the entire command procedure or run the phases separately. You will usually want to run the entire command procedure at one time. However, sometimes you may want to run the phases one at a time and check the results before proceeding. For example, you may want to check the values placed by FINDVAL in <application-name>_GENVAR.DAT before running the rest of ACMEXCPAR.COM. To do so, run the FINDVAL phase as follows:

```
$ SET DEFAULT SYS$MANAGER
$ @ACMEXCPAR FINDVAL <application-name>
```

FINDVAL edits the <application-name>_GENVAR.DAT file or creates it (if it does not exist) and places variable values in the file. Edit the file, make any changes, and run the final three phases (GENVAR, GENPAR, and WRITEPAR) as follows:

```
$ @ACMEXCPAR CURRENT <application-name>
```

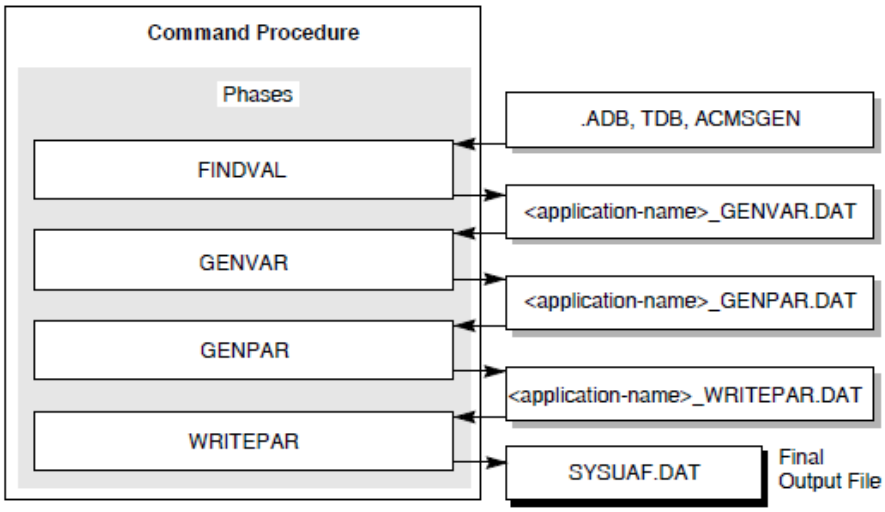
Using the CURRENT parameter invokes the GENVAR, GENPAR, and WRITEPAR phases consecutively.

The ACMEXCPAR procedure uses information in .ADB and .TDB database files, and ACMSGEN parameters to set the initial variables, and puts them in <application-name>_GENVAR.DAT.
The FINDVAL phase takes the application name you supply at the command line and appends "_GENVAR.DAT" to it. This file contains initialization values specific to the application you named.

See *Table 10.4, "Phases of ACMEXCPAR.COM"* for a summary of the four phases.

Figure 10.2, "Setting EXC Process Quotas with ACMEXCPAR.COM" illustrates the interaction of the four phases of ACMEXCPAR.COM.

Figure 10.2. Setting EXC Process Quotas with ACMEXCPAR.COM



Before running ACMEXCPAR.COM, make sure that all logicals used in application and task definitions are defined. Otherwise, the procedure may fail.

Table 10.4. Phases of ACMEXCPAR.COM

Phase	Description
FINDVAL	
Input file	None
Output file	SYS$MANAGER: <application-name>_GENVAR.DAT

Phase	Description
Function	The FINDVAL phase performs the first phase of the ACMEXCPAR.COM procedure. FINDVAL creates a file, <application-name>_GENVAR.DAT, that contains initialization values for the ACMEXCPAR.COM procedure. These values are derived by running ACMSGEN and by using ADU to gather information from the application database and its task group databases. FINDVAL automatically derives the name of the output file from the application name that you supply when you invoke the FINDVAL command procedure. You can also directly create and edit the <application-name>_GENVAR.DAT file. See *Section 10.3.2, "Supplying Variable Values for ACMEXCPAR.COM"* to create the initialization file without using FINDVAL.
GENVAR	
Input file	SYS$MANAGER: <application-name>_GENVAR.DAT
Output file	SYS$MANAGER: <application-name>_GENPAR.DAT
Function	The GENVAR phase performs the second phase of the ACMEXCPAR.COM procedure. GENVAR ensures that values are specified for all variables necessary to calculate EXC quotas. GENVAR automatically derives the names of the input and output files from the application name that you supply when you run the GENVAR command procedure.
GENPAR	
Input file	SYS$MANAGER: <application-name>_GENPAR.DAT
Output file	SYS$MANAGER: <application-name>_WRITEPAR.DAT
Function	The GENPAR phase performs the third phase of the ACMEXCPAR.COM procedure. GENPAR calculates quota values for the Application Execution Controller (EXC). The phase reads the variable values from <application-name>_GENPAR.DAT, calculates the quota values, and writes the values to the file <application-name>_WRITEPAR.DAT. GENPAR automatically derives the names of the input and output files from the application name you supply when you run the command procedure.
WRITEPAR	
Input file	SYS$MANAGER: <application-name>_WRITEPAR.DAT
Output file	SYS$SYSTEM:SYSUAF.DAT
Function	The WRITEPAR phase performs the fourth phase of the ACMEXCPAR.COM procedure. WRITEPAR reads the quota values from <application-name>_WRITEPAR.DAT and uses them to modify the system user authorization file, SYSUAF.DAT. WRITEPAR derives the input file name from the application name you supply when you run the procedure.

10.3.2. Supplying Variable Values for ACMEXCPAR.COM

ACMEXCPAR.COM requires initial variables to calculate the EXC process quota values needed to run ACMS. *Table 10.5, "Variables Required for ACMEXCPAR.COM"* lists these variables. The variables are stored in SYS$MANAGER: <application-name>_GENVAR.DAT. ACMEXCPAR.COM derives the variable values by:

- Running ACMSGEN to gather ACMSGEN parameters.
- Using ADU to gather information from the .ADB file and its .TDB files.

Note

ACMSEXCPAR.COM does not support logical name search lists for TDB file specifications.

The two ways to gather the variables used to calculate EXC process quotas are:

- Run the ACMEXCPAR.COM FINDVAL phase. FINDVAL derives the variable values by running ACMSGEN and reading from the application and task group databases. FINDVAL creates the file <application-name>_GENVAR.DAT.
- Copy the template file SYS$MANAGER:ACMEXCPAR_GENVAR.DAT to SYS$MANAGER: <application-name>_GENVAR.DAT. Then edit the file and use it for input to the FINDVAL phase rather than having FINDVAL derive the values as described earlier. This allows you to set values for several variables that FINDVAL would otherwise supply with defaults (AGENT_CNT, LOCAL_TDMS_TASK_CNT, REMOTE_AGENT_CNT, REMOTE_TK_INSTANCE_CNT). *Example 10.2, "Variables in ACMEXCPAR_GENVAR.DAT Template"* shows a copy of the SYS$MANAGER:ACMEXCPAR_GENVAR.DAT template.

  Example 10.2. Variables in ACMEXCPAR_GENVAR.DAT Template

```
AGENT_CNT =
EXC_USERNAME :=
EXC_TK_INSTANCE_CNT =
EXC_RLB_CNT =
EXC_MSG_CNT =
EXC_TDB_CNT =
EXC_RLB_BLKS =
EXC_SERVER_CNT =
EXC_SP_CNT =
FORM_CNT =
LOCAL_TDMS_TASK_CNT =
REMOTE_AGENT_CNT =
REMOTE_TK_INSTANCE_CNT =
```

Section 10.3.1, "Running ACMEXCPAR.COM" describes how to run ACMEXCPAR.COM.

After you become familiar with your ACMS system, you might choose to modify EXC quotas by editing the input or output files of FINDVAL, GENVAR, GENPAR, and WRITEPAR and then running each phase individually. *Section 10.3.3, "Modifying Variable Values for Use by ACMEXCPAR.COM"* describes this method of modifying parameters.

Table 10.5, "Variables Required for ACMEXCPAR.COM" describes the variables included in the <application-name>_GENVAR.DAT file and required by ACMEXCPAR.COM. The table lists the ACMS EXC process quotas whose calculations are affected, in part or in whole, by the variables from

this file. Most of the variables are application-specific. ACMEXCPAR.COM determines these from information in the .ADB and .TDB database files.

Six variables in <application-name>_GENVAR.DAT map directly to the ACMSGEN parameters MSS_MAXBUF, MSS_PROCESS_POOL, TWS_POOLSIZE, TWSC_POOLSIZE, WS_POOLSIZE, and WSC_POOLSIZE. The ACMSGEN parameters are set by ACMSPARAM.COM, and the values are used by ACMEXCPAR.COM to set the appropriate EXC process quotas. Always run ACMSPARAM.COM before running ACMEXCPAR.COM so that these values are set correctly.

Table 10.5. Variables Required for ACMEXCPAR.COM

Variable	
AGENT_CNT	
Description	Number of agent processes on the local system submitting tasks to this application. This includes CP, QTI, ALL-IN-1 processes, Request Interface (RI) agents, EXC (if application is using detached tasks), and any other customer-supplied agents submitting tasks to this application.
Default	2
Affects	ASTLM
EXC_ADB_BLKS	
Description	Size, in blocks, of the application.
Default	Size, in blocks, of the .ADB file.
Affects	EXC process quota PGFLQUOTA
EXC_MSG_CNT	
Description	Number of different message files referred to by all of the task groups in this application.
Default	Number of message files referred to by task groups in the application (from the ADU **`DUMP GROUP`** command).
Affects	ENQLM, FILLM
EXC_RLB_BLKS	
Description	Total size (in blocks) of request library (.RLB) files referred to by all of the task groups in this application. Add the size of a request library once for each different task group that refers to it.
Default	Total size of .RLBs from EXC_RLB_CNT variable.
Affects	PGFLQUOTA
EXC_RLB_CNT	
Description	Number of different request library (.RLB) files referred to by all of the task groups in this application. Count a request library once for each different task group that refers to it.
Default	Number of .RLB files referred to by task groups in the application (from the ADU **`DUMP GROUP`** command).
Affects	ENQLM, FILLM
EXC_SERVER_CNT	

Variable	
Description	Number of servers defined in the application database (from the ADU **DUMP APPLICATION** command).
Default	Number of servers defined in the application database (from the ADU **DUMP APPLICATION** command).
Affects	ASTLM, TQELM
EXC_SP_CNT	
Description	Number of server processes that can be started for the application at any one time.
Default	Number of servers defined in the application database (from the ADU **DUMP APPLICATION** command).
Affects	ASTLM, TQELM
EXC_TDB_BLKS	
Description	Size, in blocks, of all the TDBs for the application.
Affects	EXC process quota PGFLQUOTA
EXC_TDB_CNT	
Description	Number of task group databases referred to in this application.
Default	Number of .TDB files referred to in the application database (from the ADU **DUMP APPLICATION** command).
Affects	ENQLM, FILLM, PGFLQUOTA
EXC_TK_INSTANCE_CT	
Description	The maximum number of currently executing tasks for this application.
Default	MAXIMUM TASK INSTANCES from the application database, or 64 if none is specified.
Affects	ASTLM, BIOLM, BYTLM, DIOLM, PGFLQUOTA, TQELM, WSDEFAULT, WSQUOTA, WSEXTENT
EXC_USERNAME	
Description	User name for the Application Execution Controller (EXC) process. This user name must match the APPLICATION USERNAME specified in the application definition, and be enclosed in quotes or be assigned using the DCL string operator ":=".
Default	APPLICATION USERNAME from the application database (.ADB)
Affects	EXC user name entry in the system authorization file
FORM_CNT	
Description	Number of different DECforms form (.FORM) files referred to by all of the task groups in this application. Count a form file once for each different task group that refers to it.
Default	Number of .FORM files referred to by task groups in the application (from the ADU **DUMP GROUP** command).
Affects	ENQLM, FILLM

Variable	
LOCAL_TDMS_TASK_CNT	
Description	Number of concurrently active task instances using TDMS that are submitted by users on the local system. Do not include tasks using TDMS that are submitted from Request Interface (RI) agents.
Default	10
Affects	PGFLQUOTA
REMOTE_AGENT_CNT	
Description	Number of remote agents (CP, RI, user-written) submitting tasks to this application from remote systems.
Default	1
Affects	BIOLM, BYTLM, FILLM
REMOTE_TK_INSTANCE_CNT	
Description	Number of concurrently active task instances submitted by users on remote systems. This includes task instances submitted from any type of ACMS agent (including CPs) on remote systems.
Default	5
Affects	BYTLM

10.3.3. Modifying Variable Values for Use by ACMEXCPAR.COM

Modify the quota values by editing the input or output files of the ACMEXCPAR.COM phases. To calculate quotas on your ACMS system using this method, run each phase separately. To run a single phase, set your default to SYS$MANAGER and name the phase when you type the command to run ACMEXCPAR.COM:

```
$ SET DEFAULT SYS$MANAGER
$ @ACMEXCPAR.COM GENVAR MYAPPL
```

The ACMEXCPAR procedure uses as input the initialization values in the file MYAPPL_GENVAR.DAT. ACMEXCPAR derives this file name during the GENVAR phase of the procedure. The GENVAR phase takes the MYAPPL application name from the command line and appends "_GENVAR.DAT" to it. The MYAPPL_GENVAR.DAT file contains initialization values that are specific to the MYAPPL application.

Whenever you change a parameter, run all subsequent phases in order to obtain the correct EXC quota values. For example, if you alter a value in the MYAPPL_GENPAR.DAT file, you must invoke GENPAR to perform the calculations, and then invoke WRITEPAR to read the new values and modify the SYSUAF.DAT file.

Enter the following command to run the GENPAR phase using the values in the file MYAPPL_GENPAR.DAT as input:

```
$ @ACMEXCPAR GENPAR MYAPPL
```

VSI recommends use of the ACMSPARAM.COM and ACMEXCPAR.COM procedures to set system parameters and quotas because these procedures automatically modify other parameters that relate to

the parameters that you are changing. However, there are some variables used by ACMSPARAM.COM and ACMEXCPAR.COM that you may want to calculate independently of the command procedures. *Appendix A, "Parameter and Quota Calculations"* explains in more detail calculations for these variables. Use these formulas for informational or fine-tuning purposes only.

Chapter 11. Changing ACMS Parameter Values with the ACMSGEN Utility

This chapter explains how to use the ACMSGEN Utility to change the values of ACMS system parameters. See *Section 11.8, "Summary of ACMSGEN Commands and Qualifiers"* for a summary of ACMSGEN commands and qualifiers. For reference information on the commands described in this chapter, refer to *Chapter 22, "ACMSGEN Commands"*.

You can also adjust the ACMSGEN-generated parameters using the command procedure ACMSPARAM.COM. It is recommended that you use ACMSPARAM.COM rather than the ACMSGEN Utility, because ACMSPARAM.COM not only adjusts the ACMSGEN parameters, but ACMSPARAM.COM also uses the modified ACMSGEN parameters to modify other related parameters and quotas. *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* describes the ACMSPARAM.COM and ACMEXCPAR.COM command procedures.

11.1. How ACMSGEN Works

The ACMSGEN Utility is an ACMS tool that lets you modify and display ACMS system parameters. ACMSGEN works in much the same way that the OpenVMS SYSGEN Utility lets you change OpenVMS parameters. The ACMSGEN commands are a subset of the OpenVMS SYSGEN commands, but the ACMSGEN parameters are different.

ACMS keeps a set of systemwide parameter values in parameter files. When the ACMS system starts up, it reads in the current parameter file SYS$SYSTEM:ACMSPAR.ACM.

Once ACMS reads the parameter file, the parameters are stored in the active parameter global section. The ACMSGEN Utility can place the parameter file and the active parameter global section in an ACMSGEN work area. Then use ACMSGEN to examine and change parameter values in the ACMSGEN work area. Finally, you can issue the **WRITE** command to have ACMSGEN write out the work area to a parameter file or to the active parameter global section. By default, ACMSGEN reads the current parameter file on ACMS system startup and does not write out the work area on exit.

Table 11.1, "ACMS Components Affected by ACMSGEN Parameters" describes the system components affected by ACMSGEN parameters.

Table 11.1. ACMS Components Affected by ACMSGEN Parameters

ACMS Component	Description
ACMS Central Controller (ACC)	Creates and controls ACMS processes. The ACMSGEN parameters affecting the ACC include the priority of the ACC and its OpenVMS user name.
Command Process (CP)	Accepts, interprets, and services task selections. With Command Process parameters, you can control which OpenVMS user name the processes run under, and at what priority the processes run.
Terminal Subsystem Controller (TSC)	Handles ACMS sign-ins and manages Command Processes. With TSC parameters, you can control the maximum and minimum

ACMS Component	Description
	number of Command Processes that can be active, the maximum number of terminals that can be serviced by a single Command Process, the user name the TSC processes run under, and the priority of the TSC processes.
Workspace Pool	Used by the Application Execution Controller for workspace control and manipulation. Use ACMSGEN to specify the number of pagelets that are allocated to the pools used for workspaces.
Message Switch	Helps ACMS processes communicate with each other. Use ACMSGEN parameters to control the size of the messages and the amount of memory that can be used to send messages.
Queued Task Initiator (QTI)	Controls ACMS task queues and dequeues queued task elements for processing. Use ACMSGEN parameters to define the user name and priority for the QTI process.

11.2. How to Run the ACMSGEN Utility

No special privileges are required to use the ACMSGEN Utility, but to make permanent changes to an ACMS system, you need the OpenVMS SYSPRV privilege. To change parameters for an active system, you must have the OpenVMS OPER privilege.

Start the ACMSGEN Utility by using either of the following commands:

```
$ MCR ACMSGEN
ACMSGEN>
```

or

```
$ RUN SYS$SYSTEM:ACMSGEN
ACMSGEN>
```

When you see the ACMSGEN Utility prompt (ACMSGEN>), begin to enter ACMSGEN commands. For example:

```
ACMSGEN> SHOW /ALL
```

To get information about an ACMSGEN Utility command, type **HELP** followed by the command name. For example:

```
ACMSGEN> HELP SHOW
```

Press **Ctrl/B** to recall each ACMSGEN command you enter.

Instead of typing in ACMSGEN commands individually, use the ACMSGEN command keypad. Press **PF1** then **PF2** for access to the command keypad. When you are finished with ACMSGEN, type **EXIT** or press **Ctrl/Z** to leave ACMSGEN and return to DCL:

```
ACMSGEN> EXIT
$
```

11.3. Types of Parameter Values

The four types of parameter values for you to work with are:

- Active values

  Values ACMS uses when active. ACMS keeps active values in a system global section. You can change active values for some ACMS system parameters, called dynamic parameters. Change active values for dynamic parameters by writing new values directly to the system global section. The new active values stay in effect as long as ACMS is active, or until you change the active values again.

- Current values

  Values ACMS uses for initializing the active values. ACMS keeps current values in the parameter file SYS$SYSTEM:ACMSPAR.ACM. You can change current values for all ACMS system parameters.

- Work file values

  Values you have written to a work file with the ACMSGEN Utility. You can write values to a work file, change the values you have saved, and use the work file values later to update current or active values. See *Section 11.5, "Using a Parameter Work File"* for more information on ACMSGEN work files.

- Default values

  Values in a default list supplied with the ACMSGEN Utility. Use these default values to reset current, active, or work file values.

11.4. Changing Parameter Values

This section describes how to change current and active parameter values.

11.4.1. Changing Current Values

You can change the current value for any ACMS parameter. However, in addition to SYSPRV privilege, you must have write access to the ACMS parameter file.

To change the current value for one or more parameters, first initialize the work area with the **USE CURRENT**, **USE ACTIVE**, **USE DEFAULT**, or **USE** command. Then, if necessary, change one or more values in the work area with the **SET** command. Finally, update current values with the **WRITE CURRENT** command.

Make all of your changes without using the **SET** command if you are only:

- Updating current values with values in a work file
- Resetting all parameters to default values
- Updating current values with active values

The following commands increase the number of ACMS terminals by increasing the values of both the MAX_LOGINS and CP_SLOTS parameters:

```
ACMSGEN> SET MAX_LOGINS 25
ACMSGEN> SET CP_SLOTS 5
ACMSGEN> WRITE CURRENT
```

If this is the first work you do in an ACMSGEN Utility session, the work area contains current values when you begin, so you do not need to use the **USE CURRENT** command. The **SET** command places

new values for MAX_LOGINS and CP_SLOTS in the work area. The **WRITE CURRENT** command writes all values from the work area to the SYS$SYSTEM:ACMSPAR.ACM file as new current values. These new current values take effect the next time you start the ACMS system.

Use these same commands (**SET** and **WRITE CURRENT**) to reset some current values to ACMS defaults. If you need to display default values or other parameter information on the terminal, use the **SHOW** command, as described in *Section 11.6, "Displaying Parameter Values"*.

To reset all current values to ACMS defaults, use the **USE DEFAULT** and **WRITE CURRENT** commands:

```
ACMSGEN> USE DEFAULT
ACMSGEN> WRITE CURRENT
```

The **USE DEFAULT** command places ACMS default values in the work area. The **WRITE CURRENT** command writes the default values to the SYS$SYSTEM:ACMSPAR.ACM file as new current values.

If you have created a work file with the ACMSGEN Utility, you can update current values with values from the work file. Use the **USE** command to initialize the work area with values from the work file you name as a parameter. For example:

```
ACMSGEN> USE WORK
ACMSGEN> WRITE CURRENT
```

The **USE** command initializes the work area with values from the work file SYS$SYSTEM:WORK.ACM. The **WRITE CURRENT** command updates current values in the SYS$SYSTEM:ACMSPAR.ACM file with values from the work area.

If you change active values and want to make the changes permanent, update the current values for dynamic parameters with their active values. For example:

```
ACMSGEN> USE ACTIVE
ACMSGEN> WRITE CURRENT
```

The **USE ACTIVE** command initializes the work area with active values from the global section for active values. The **WRITE CURRENT** command updates the current values in the SYS$SYSTEM:ACMSPAR.ACM file with values from the work area.

11.4.2. Changing Active Values

You can change the active values only for dynamic parameters. To change active values, you must have SYSPRV privilege. To change the active values for one or more dynamic parameters, first initialize the work area with the **USE**, **USE ACTIVE**, **USE CURRENT**, or **USE DEFAULT** command. Then, if necessary, change one or more values in the work area with the **SET** command. Finally, update active values for dynamic parameters with the **WRITE ACTIVE** command.

Make all your changes without using the **SET** command if you are only:

- Updating current values with values in a work file
- Resetting all parameters to default values
- Updating active values for dynamic parameters with current values

For example, to change the active value of the MIN_CPIS parameter to 3, enter:

```
ACMSGEN> USE ACTIVE
```

```
ACMSGEN> SET MIN_CPIS 3
ACMSGEN> WRITE ACTIVE
```

The **USE ACTIVE** command initializes the work area with the values of the active ACMS system. The **SET** command places the value 3 into the work area as the value for MIN_CPIS. The **WRITE ACTIVE** command writes values from the work area to the global section for active values. The value 3 is the active value for MIN_CPIS. That value stays in effect until ACMS stops or until you change the value again.

Use these same commands to reset some active values to ACMS defaults. To display default values or other parameter information, use the **SHOW** command, described in *Section 11.6, "Displaying Parameter Values"*.

Set the active values for all dynamic parameters to default values with the **USE DEFAULT** and **WRITE ACTIVE** commands. For example:

```
ACMSGEN> USE DEFAULT
ACMSGEN> WRITE ACTIVE
```

The **USE DEFAULT** command initializes the work area with ACMS default values for all parameters. The **WRITE ACTIVE** command makes the ACMS defaults the active values of ACMS, writing values from the work area to the global section for active values.

Update active values with values from a work file. For example:

```
ACMSGEN> USE WORK
ACMSGEN> WRITE ACTIVE
```

The **USE** command initializes the work area with values from the work file SYS$SYSTEM:WORK.ACM. The **WRITE ACTIVE** command updates active values for dynamic parameters with values from the work area.

If you recently updated current values and want the new values to take effect immediately, you can update the active values for dynamic parameters with the new current values. For example:

```
ACMSGEN> USE CURRENT
ACMSGEN> WRITE ACTIVE
```

The **USE CURRENT** command initializes the work area with values from the SYS$SYSTEM:ACMSPAR.ACM file. The **WRITE ACTIVE** command updates the active values of dynamic parameters with values from the work area.

11.5. Using a Parameter Work File

To save current or active values for any reason, copy the values to a work file. Use the ACMSGEN Utility to change values you have saved. Use the values in the work file later as current or active values for ACMS.

To save values in a work file, use the **WRITE** command. The **WRITE** command copies values from the work area to the file you name, creating a new version of the file:

```
ACMSGEN> WRITE WORK
```

Because the file specification is not complete, this command writes the values in the work area to the file SYS$SYSTEM:WORK.ACM. If this is the first command in an ACMSGEN session, the command writes the current values of ACMS system parameters to the file.

To save active values in a work file, use the **USE ACTIVE** and **WRITE** commands:

```
ACMSGEN> USE ACTIVE
ACMSGEN> WRITE WORK
```

The **USE ACTIVE** command initializes the work area with active values for parameters. The **WRITE** command writes the active values for dynamic ACMS parameters to the file SYS$SYSTEM:WORK.ACM, creating a new version of the file.

To copy default values to a work file, use the **USE DEFAULT** and **WRITE** commands:

```
ACMSGEN> USE DEFAULT
ACMSGEN> WRITE WORK
```

The **USE DEFAULT** command initializes the work area with default values. The **WRITE** command writes the default values for ACMS system parameters to the file SYS$SYSTEM:WORK.ACM, creating a new version of the file.

To change the values in a work file, or to use them to update current or active values, use the **USE** command to copy work file values into the work area. If you do not include device and directory in your file specification with the **USE** command, the default is SYS$SYSTEM. For example:

```
ACMSGEN> USE WORK
ACMSGEN> SET MAX_LOGINS 25
ACMSGEN> SET CP_SLOTS 5
ACMSGEN> WRITE WORK
```

The **USE** command initializes the work area with values from the work file SYS$SYSTEM:WORK.ACM. The **SET** command changes the value for the MAX_LOGINS parameter to 25 and the value for the CP_SLOTS parameter to 5 in the work area. The **WRITE** command writes values from the work area to the file SYS$SYSTEM:WORK.ACM, creating a new version of the file.

To update current values with values from a work file, use the **USE** command and the **WRITE CURRENT** command. To update active values with values from a work file, use the **USE** command and the **WRITE ACTIVE** command. These commands are described in *Chapter 22, "ACMSGEN Commands"*.

11.6. Displaying Parameter Values

Use the **SHOW** command to get information about ACMS parameters, including their current, active, or default values. You can display values before changing them.

You must use either a qualifier or the name of an ACMS parameter with the **SHOW** command.

The **SHOW** command displays the following information for each parameter displayed:

- Name of the parameter
- Value in the work area
- Default value
- Minimum value

- Maximum value
- Unit of measure
- Dynamic/fixed status

To display information about all ACMS parameters including their current values, use the **ACMSGEN SHOW/ALL** command. *Example 11.1, "ACMSGEN SHOW/ALL Command"* shows a sample display for this command.

Example 11.1. ACMSGEN SHOW/ALL Command

```
ACMSGEN> SHOW/ALL
❶
Parameters in use: CURRENT
                          ❷        ❸              ❹        ❺             ❻
Parameter Name   Current  Default  Minimum  Maximum      Unit
 Dynamic
--------------   -------  -------  -------  -------      ----
 -------
MAX_LOGINS           60       60       0        -1       submitters
 D
MAX_TTS_CP           20       20       0        -1       terminals
 D
PERM_CPS             1        1        0        -1       command prcs
 D
CP_SLOTS             3        3        0        -1       command prcs
MIN_CPIS             2        2        0        -1       CP threads
 D

TSC_USERNAME         ACMS$TSC SYSTEM
TSC_PRIORITY         6        4        0        31       VMS Priority
ACC_USERNAME         ACMS$ACC SYSTEM
ACC_PRIORITY         6        4        0        31       VMS Priority
CP_USERNAME          ACMS$CP  SYSTEM
CP_PRIORITY          6        4        0        31       VMS Priority

MAX_APPL             10       10       0        -1       applications
MSS_POOLSIZE         512      512      1        -1       Pagelets
MSS_MAXBUF           1024     1024     512      65535    Bytes
MSS_MAXOBJ           500      500      1        -1       Objects

WS_POOLSIZE          256      256      1        -1       Pagelets
WSC_POOLSIZE         128      128      1        -1       Pagelets
TWS_POOLSIZE         1600     1600     1        -1       Pagelets
TWSC_POOLSIZE        50       50       1        -1       Pagelets
USERNAME_DEFAULT     ACMS_USER
 D
NODE_NAME                ARK


MSS_PROCESS_POOL     256      256      1        -1       Pagelets
MSS_NET_RETRY_TIMER  10       10       1        -1       seconds
 D
QTI_USERNAME         QTI_NAME SYSTEM                    VMS username
QTI_PRIORITY         4        4        0        31       VMS Priority
QTI_SUB_TIMEOUT      7200     7200     1        -1       seconds
 D
```

```
QTI_RETRY_TIMER      180      1800     1        -1       seconds
 D
QTI_POLLING_TIMER    5000     5000     1        -1       milliseconds
 D
```

The numbers in *Example 11.1, "ACMSGEN SHOW/ALL Command"* correspond to the list that follows:

❶ Parameters in use

Displays the source of the values now in the work area. The CURRENT, ACTIVE, or DEFAULT keyword, or a file specification, can follow "Parameters in use ". At the start of an ACMSGEN session, the keyword CURRENT follows "Parameters in use" because the work area contains current values by default. Each **USE** command changes the information following "Parameters in use".

❷ Current

Shows the values that are currently in the work area. Before you use a **USE** or **SET** command, the "Current" column contains current values. **USE** and **SET** commands change the values you see in the "Current" column.

❸ Default

Lists ACMS default values.

❹ Minimum and Maximum

Contain the limits for parameter values. A value of -1 means that a parameter has no maximum value.

❺ Unit

Displays the units of measure for each parameter value. "CP Threads" refers to Command Process threads. Each user has one Command Process thread. "Submitters" refers to ACMS users.

❻ Dynamic

Indicates whether a parameter is dynamic or fixed. A blank in the dynamic column means that a parameter is fixed.

To display values for parameters affecting the TSC, use the ACMSGEN **SHOW/TSC** command. *Example 11.2, "ACMSGEN SHOW/TSC Command"* shows a sample display from this command.

Example 11.2. ACMSGEN SHOW/TSC Command

```
ACMSGEN> USE ACTIVE
ACMSGEN> SHOW/TSC
Parameters in use: ACTIVE
Parameter Name      Current  Default  Minimum  Maximum  Unit
 Dynamic
--------------      -------  -------  -------  -------  ----
 -------
MAX_LOGINS          20       60       0        -1       submitters     D
MAX_TTS_CP           5       20       0        -1       terminals      D
PERM_CPS            1        1        0        -1       command prcs   D
CP_SLOTS            3        3        0        -1       command prcs
```

```
MIN_CPIS              2         2         0         -1        CP threads      D
TSC_USERNAME          SYSTEM    SYSTEM                        VMS username
TSC_PRIORITY          6         4         0         31        VMS priority
```

The ACTIVE keyword after "Parameters in use" indicates that the last **USE** command was **USE ACTIVE**.

To display a value for one parameter, type **SHOW** followed by the name of the parameter. For example, the following **SHOW** command displays a value for the MAX_LOGINS parameter from the work file WORK.ACM in SYS$SYSTEM:

```
ACMSGEN> USE WORK
ACMSGEN> SHOW MAX_LOGINS
```

The **USE** command initializes the work area with values from the work file WORK.ACM. The **SHOW** command displays the value from the work file for the MAX_LOGINS parameter. The following is a sample display for the **SHOW MAX_LOGINS** command:

```
ACMSGEN>SHOW MAX_LOGINS
MAX_LOGINS            20        60        0         -1        submitters      D
```

When you display information for only one parameter, the display does not contain headers.

11.7. ACMS Parameters

This section lists the types of ACMS parameters and their value ranges, and provides a description of each ACMS parameter.

11.7.1. Types of ACMS Parameters

The six types of ACMS parameters are: ACC, CP, message switch, QTI, TSC, and workspace pool.

Table 11.2, "ACMS Parameters" lists the ACMS parameters according to parameter type and lists the commands you can use to display the parameters. See *Section 11.7.2, "Parameter Descriptions"* for parameter descriptions.

Table 11.2. ACMS Parameters

Command	Parameter
ACMS Central Controller Parameters	
SHOW/ACC	ACC_PRIORITY
	ACC_USERNAME
	MAX_APPL
	USERNAME_DEFAULT
Command Process Parameters	
SHOW/CP	CP_PRIORITY
	CP_USERNAME
Message Switch Parameters	

Command	Parameter
SHOW/MSS	MSS_MAXBUF
	MSS_MAXOBJ
	MSS_NET_RETRY_TIMER
	MSS_POOLSIZE
	MSS_PROCESS_POOL
	NODE_NAME
Queued Task Initiator Parameters	
SHOW/QTI	QTI_POLLING_TIMER
	QTI_PRIORITY
	QTI_RETRY_TIMER
	QTI_SUB_TIMEOUT
	QTI_USERNAME
Terminal Subsystem Controller Parameters	
SHOW/TSC	CP_SLOTS
	MAX_LOGINS
	MAX_TTS_CP
	MIN_CPIS
	PERM_CPS
	TSC_PRIORITY
	TSC_USERNAME
Workspace Pool Parameters	
SHOW/EXC	TWS_POOLSIZE
	TWSC_POOLSIZE
	WS_POOLSIZE
	WSC_POOLSIZE

11.7.2. Parameter Descriptions

ACC_PRIORITY

Is the OpenVMS priority used by the ACMS Central Controller. ACC_PRIORITY overrides the SYSUAF default priority. Usually the ACMS default value for ACC_PRIORITY is adequate. Too high a priority can lock out other OpenVMS users. Too low a priority decreases ACMS performance.

ACC_USERNAME

Is the OpenVMS user name used by the ACMS Central Controller. The default user name is SYSTEM. See *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* for information about the privileges and quotas you assign to ACC_USERNAME.

CP_PRIORITY

Is the OpenVMS priority used by Command Processes. CP_PRIORITY overrides the SYSUAF default priority. Usually the ACMS default value for CP_PRIORITY is adequate. Too high a priority can lock out other OpenVMS users. Too low a priority decreases ACMS performance.

CP_SLOTS

Limits the number of Command Processes that can be active. Because each terminal must be assigned to a Command Process, too low a value limits the number of terminals an active ACMS system can handle. The value for the CP_SLOTS parameter can be high without decreasing performance.

CP_USERNAME

Is the OpenVMS user name used by Command Processes. The default user name is SYSTEM. The user name you assign must have read access to the file pointed to by the logical name ACMS$NOTICE. See *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* for information about the privileges and quotas you assign to CP_USERNAME. The CP user name must be authorized as an agent in the UDU authorization file.

MAX_APPL

Limits the number of applications that can be active at any time. When the number of started applications reaches MAX_APPL, any attempt to start an additional application fails. Too high a value allows too many applications to be started, which can decrease system performance. Too low a value unnecessarily restricts the number of applications you can start.

MAX_LOGINS

Limits the number of users who can sign in to ACMS. You can set MAX_LOGINS to 0 if you do not want anyone to sign in. Too high a value for MAX_LOGINS decreases performance by letting too many users sign in to ACMS. See *Section A.5.1, "Calculating the Value of MAX_LOGINS"* for information about changing the value of this parameter.

MAX_TTS_CP

Limits the number of terminals ACMS can assign to a Command Process. ACMS assigns terminals to a Command Process until the number of terminals assigned reaches the MAX_TTS_CP value. Too low a value for MAX_TTS_CP minimizes the advantages of using Command Processes by decreasing the ratio of terminals to processes. Too high a value slows the system.

MIN_CPIS

Prevents delays at sign-in by starting command processes before users need them. ACMS can always assign at least the number of terminals set by the MIN_CPIS value to an active command process. If user's signing in decreases the number of possible assignments to less than the value of MIN_CPIS, ACMS starts another Command Process. If the value for the MIN_CPIS parameter is too low, there is a delay when a user signs in. Too high a value for the MIN_CPIS parameter decreases ACMS performance by increasing overhead.

MSS_MAXBUF

Specifies the maximum size of a message that can be sent without incurring the overhead associated with blocking the message. If MSS_MAXBUF is set at too high a level, there may never be enough memory

to allocate to the message. In this case, the message could go into a resource wait state. However, if MSS_MAXBUF is set at too low a level, overhead associated with blocking messages is incurred. See *Section A.5.3, "Calculating the Value of MSS_MAXBUF"* for information about changing the value of MSS_MAXBUF.

MSS_MAXOBJ

Specifies the maximum number of message switch objects that can be created on a system at one time. The MSS_MAXOBJ parameter determines the size of the table set up in the message pool. If MSS_MAXOBJ is set at too high a level, this table uses more of the message switch global pool, whose size is affected by the MSS_POOLSIZE parameter. However, if MSS_MAXOBJ is set at too low a level, message switch created objects will fail and cause some ACMS operations to fail. In this case, the Software Event Log contains the message MSS$_OBJFULL_F_ object table full, indicating that MSS_MAXOBJ has been exceeded.

MSS_NET_RETRY_TIMER

Defines the number of seconds ACMS waits to retry creating a DECnet object when ACMS distributed processing is enabled. The range for this parameter is 1 to -1 seconds. The default is 10 seconds.

MSS_POOLSIZE

Is the maximum amount of memory that can be used to send messages. The MSS_POOLSIZE parameter sets up a global section backed by the page file. If the MSS_POOLSIZE parameter is set at too high a level, system parameters associated with global sections (gblsections and gblpages) and the page file for global sections (gblpagfil) must be increased. However, if the MSS_POOLSIZE is set at too low a level, messages may be put into a resource wait state or may fail.

MSS_PROCESS_POOL

Defines the size of the ACMS internal message switch process local pool. This pool is used for various data structures for each message switch object and for DECnet input buffers. The range for this parameter is from 1 to -1 pagelets. The default is 256 pagelets.

Note

MSS_PROCESS_POOL is overridden by the value of logical name ACMS$MSS_PROCESS_POOLSIZE if that logical name is defined. This can be useful if you need a large process pool, such as for a large number of single-threaded SI agents.

NODE_NAME

Defines the DECnet node name for your ACMS system and enables distributed ACMS processing when defined. When you define NODE_NAME, ACMS allows distributed forms processing provided DECnet is started. By default, the NODE_NAME parameter is null, which disables distributed forms processing.

PERM_CPS

Sets the number of permanently active command processes. The PERM_CPS parameter ensures that some Command Processes are always available when ACMS is active. If the value for PERM_CPS is too low, ACMS can start several Command Processes while ACMS is active. Because the overhead from

starting Command Processes is high, too low a value decreases ACMS performance. Too high a value wastes ACMS resources because some Command Processes go unused. See *Section A.5.6, "Calculating the Value of PERM_CPS"* for information about changing the value of PERM_CPS.

QTI_POLLING_TIMER

Specifies how long the QTI waits to try to access a queued task when an RMS locking situation was previously encountered the last time the QTI accessed the queue.

QTI_PRIORITY

Defines the OpenVMS priority for the QTI process. A value that is too high locks out other OpenVMS users; a value that is too low can decrease ACMS performance.

QTI_RETRY_TIMER

Specifies how long the QTI waits before attempting to reinvoke a queued task whose previous invocation failed. For example, if the application is not started, then the QTI waits the specified number of seconds before reinvoking the queued task.

When a queued task element does not complete successfully and is to be retried later, the QTI process sets the queued task element on HOLD. These elements, which have been placed on hold by the QTI, have a state value of "HOLD (RETRY PENDING)" when displayed by the ACMSQUEMGR using the **`SHOW ELEMENT`** command.

When the number of seconds identified by the QTI_RETRY_TIMER parameter has elapsed, the QTI process resets the element to NOHOLD. Thus, the element becomes a candidate for the next dequeue operation on the queue by a task execution thread. Elements are dequeued by highest priority, and are first-in/first-out (FIFO) within priority.

The effective value of QTI_RETRY_TIMER can be slightly greater than the value you set for the QTI_RETRY_TIMER parameter. That is, the amount of time that the QTI waits before retrying a failed task may be slightly longer than you specify. For the QTI to reset the hold state of queued task elements that are to be retried, it periodically scans all the task queues that are started and inspects the queued task elements that are in the HOLD (RETRY PENDING) state. The frequency at which the QTI performs this scan is 1/10 the value of QTI_RETRY_TIMER, but no less than every second and no more than every 5 minutes. For example, if QTI_RETRY_TIMER is set for 1800 seconds (1/2 hour), then the QTI scans all started queues every 180 seconds (3 minutes). In this example, the actual effective value for QTI_RETRY_TIMER could be as long as 33 minutes even though the QTI_RETRY_TIMER value specified is 30 minutes.

QTI_SUB_TIMEOUT

Specifies the amount of time that an inactive submitter remains signed in to the system before being signed out. The QTI caches submitter sign-ins so that it is not necessary to sign in every time a task is submitted.

Because each submitter that is signed in to ACMS consumes memory resources in the QTI, the ACC, and the EXC processes, the QTI process uses a mechanism that enables it to bypass a submitter sign-in for each task. Specifically, when the QTI process dequeues a queued task element, it checks the user name of that element. If it is the first time the QTI process has dequeued an element with that user name, it signs the submitter in to ACMS. However, the QTI process does not sign out of ACMS as usual. Instead, the QTI process leaves the submitter signed in for a certain amount of time before signing it

out. That way, if another queue element with the same user name is dequeued, that user name is already signed in.

Use the ACMSGEN parameter QTI_SUB_TIMEOUT to indicate how long a submitter can remain inactive before the QTI process signs that submitter out of ACMS. To determine how many submitters are signed in under a QTI process, use the **`ACMS/SHOW QTI`** command.

QTI_USERNAME

Defines the OpenVMS user name for the queuing process. See *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* for information about the privileges and quotas you assign to QTI_USERNAME. The QTI user name must be authorized as an agent in the UDU authorization file.

TSC_PRIORITY

Specifies the OpenVMS priority used by the TSC. TSC_PRIORITY overrides the SYSUAF default priority. Usually the ACMS default value for TSC_PRIORITY is adequate. Too high a value for TSC_PRIORITY can lock out other users. Too low a value decreases ACMS performance.

TSC_USERNAME

Is the OpenVMS user name used by the TSC. The default user name is SYSTEM. See *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* in this manual for information about the privileges and quotas you assign to TSC_USERNAME.

TWS_POOLSIZE

Controls the overall size of the temporary pools that task workspaces use when a task is started. When you start a task, the group and user workspaces the task uses, as well as system workspaces and task workspaces, are copied into temporary workspaces for use by the task. At any given time, the sum of all group, user, system, and task workspaces for all active tasks cannot exceed this number. The default value is 1600 pagelets. See *Section A.5.7.3, "ACMS Workspace Pool Requirements"* for more information about workspace pools.

TWSC_POOLSIZE

Controls the overall size of the pool used to store information needed to allocate the task instance workspaces stored in the TWS_POOLSIZE pool. The default value of 50 pagelets causes the same amount of pool to be allocated as in previous versions of ACMS. See *Section A.5.7.3, "ACMS Workspace Pool Requirements"* for more information about workspace pools.

USERNAME_DEFAULT

Defines a default submitter user name account used for remote task submitters that do not have an individual proxy account, or for task submitters from non-ACMS agents. The default submitter user name account must be authorized by the OpenVMS Authorize Utility in the SYSUAF.DAT file.

WS_POOLSIZE

Specifies the number of OpenVMS pages that are allocated to the workspace pool used for the group and user workspaces. This number of pages is allocated for each application. The default value of 256 pagelets causes the same amount of pool to be allocated as in previous versions of ACMS. See *Section A.5.7.3, "ACMS Workspace Pool Requirements"* for more information about workspace pools.

WSC_POOLSIZE

Specifies the number of OpenVMS pages that are allocated to the pool used for the control information for the group and user workspaces. The default value is 128 pagelets. See *Section A.5.7.3, "ACMS Workspace Pool Requirements"* for more information about workspace pools.

11.7.3. Parameter Values

Table 11.3, "ACMSGEN Parameter Values" lists the ACMS parameters with their value ranges, their default values, and whether or not they are dynamic. The minus one (-1) value in the range column means the upper limit for the parameter is unlimited.

Table 11.3. ACMSGEN Parameter Values

Parameter	Range	Default	Dynamic
ACC_PRIORITY	0 to 31	4	No
ACC_USERNAME	None	SYSTEM	No
CP_PRIORITY	0 to 31	4	No
CP_SLOTS	0 to -1	3	No
CP_USERNAME	None	SYSTEM	No
MAX_APPL	1 to -1	10	No
MAX_LOGINS	0 to -1	60	Yes
MAX_TTS_CP	0 to -1	20[1]	Yes
MIN_CPIS	0 to -1	2	Yes
MSS_MAXBUF	512 to 65K bytes	1024 bytes	No
MSS_MAXOBJ	1 to -1 objects	500 objects	No
MSS_PROCESS_POOL	1 to -1	256	No
MSS_POOLSIZE	1 to -1 pages	512 pages[1]	No
	1 to -1 pagelets[b]	512 pagelets[b]	No
MSS_NET_RETRY_TIMER	1 to -1	10	Yes
NODE_NAME	None	None	No
PERM_CPS	0 to -1	1	Yes
QTI_POLLING_TIMER	1 to -1	5000 milliseconds	Yes
QTI_PRIORITY	0 to 31	4	No
QTI_RETRY_TIMER	1 to -1	1800 seconds	Yes
QTI_SUB_TIMEOUT	1 to -1	7200 seconds	Yes
QTI_USERNAME	None	SYSTEM	No
TSC_PRIORITY	0 to 31	4	No
TSC_USERNAME	None	SYSTEM	No
TWS_POOLSIZE	1 to -1 pages[b]	350 pages[b]	No

Parameter	Range	Default	Dynamic
	1 to -1 pagelets[b]	1600 pagelets[b]	No
TWSC_POOLSIZE	1 to -1 pages[b]	50 pages[b]	No
	1 to -1 pagelets[b]	50 pagelets[b]	No
USERNAME_DEFAULT	None	None	Yes
WS_POOLSIZE	1 to -1 pages [b]	256 pages[b]	No
	1 to -1 pagelets[b]	256 pagelets[b]	No
WSC_POOLSIZE	1 to -1 pages[b]	128 pages[b]	No
	1 to -1 pagelets[b]	128 pagelets[b]	No

[1]This value is a guideline. Depending on the complexity of the DECforms IFDL, a smaller value might be more suitable. The value selected is application-dependent.

[b]This value is Alpha-specific.

11.8. Summary of ACMSGEN Commands and Qualifiers

ACMSGEN commands allow you to change ACMS system parameters to define lower limits, quotas, process names, user names, proxy accounts, and priorities for components of ACMS. *Table 11.4, "Summary of ACMSGEN Commands"* lists the ACMSGEN commands and qualifiers and provides a brief description of each ACMSGEN command. For detailed information about ACMSGEN commands and qualifiers, see *Chapter 22, "ACMSGEN Commands"*.

Table 11.4. Summary of ACMSGEN Commands

Commands and Qualifiers	Description
EXIT	Ends the ACMSGEN session and returns you to the DCL prompt.
HELP	Displays help information about ACMSGEN commands, parameters, and qualifiers.
SET	Places a new parameter value in the ACMSGEN work area.
SHOW /ACC /ALL /CP /EXC /MSS /QTI /TSC	Displays the value in the work area, the default value, the minimum value, the maximum value, the unit of measure, and the dynamic/fixed status for ACMS system parameters.
USE	Initializes the ACMSGEN work area with values from a work file.
USE ACTIVE	Initializes the ACMSGEN work area with active values for all parameters from an ACMS system global section.
USE CURRENT	Initializes the ACMSGEN work area with current values for all parameters from the SYS$SYSTEM:ACMSPAR.ACM parameter file.
USE DEFAULT	Initializes the ACMSGEN work area with ACMS default values for all ACMS parameters.

Commands and Qualifiers	Description
WRITE	Writes values from the ACMSGEN work area to a work file, creating a new version of the file.
WRITE ACTIVE	Changes active values for dynamic parameters by writing values from the ACMSGEN work area to an ACMS system global section.
WRITE CURRENT	Changes current values by writing values from the ACMSGEN work area to the SYS$SYSTEM:ACMSPAR.ACMS file.

Chapter 12. Auditing Applications with the Audit Trail Logger

This chapter explains how to use the Audit Trail Logger (ATL) and the Audit Trail Report (ATR) Utility to monitor the use and misuse of your application. See *Section 12.9, "Summary of the ATR Commands and Qualifiers"* for a summary of ATR commands and qualifiers. For reference information on the commands described in this chapter, refer to *Chapter 23, "ATR Commands"*.

12.1. Understanding the Audit Trail Logger

The Audit Trail Logger records application and user activity in the audit trail log. The Audit Trail Logger records:

- ACMS system starts and stops
- ACMS application starts and stops
- User sign-ins and sign-outs
- What tasks users run and where they encounter errors
- What activities are taking place on distributed ACMS systems
- User errors
- Modifications to application, task, and server attributes
- Server process dumps
- Queued Task Initiator (QTI) process events
- Server image replacement
- Other significant events

The Audit Trail Logger is automatically started with the ACMS system. Disable the Audit Trail Logger by using the **/NOAUDIT** qualifier either on the **ACMS/START SYSTEM** command or the **ACMS/SET SYSTEM** command. When the Audit Trail Logger is disabled, it only records file opens and closes. Use the **/AUDIT** qualifier with either of these commands to reenable auditing.

Use the ATR Utility to display audit trail records or write them to an output file.

12.2. Using the Audit Trail Log File

Each time the ACMS system starts, it creates a new version of the audit trail log file. ACMS writes Audit Trail Logger information to the file SYS$ERRORLOG:ACMSAUDIT.LOG by default. The default protection for the audit trail log file is (S:RD,O:RWED,G:R). The Audit Trail Logger must have write access to the audit trail log file for you to start your ACMS system.

The Audit Trail Logger attempts to translate the following logical names, which you can define, and uses the values of the logical names for file allocation when ACMS creates the audit trail log file:

- ACMS$ATL_DEQ_BLOCKS – The default extension quantity (DEQ) specifies the number of blocks to be added when the file is extended. Valid values are 0 through 65535.

- ACMS$ATL_ALQ_BLOCKS – The allocation quantity (ALQ) specifies the number of blocks to be initially allocated when the log is created. Valid values are 0 through 4,294,967,295.

See the *VSI OpenVMS Record Management Services Reference Manual* [https://docs.vmssoftware.com/vsi-openvms-record-management-services-reference-manual/] for additional information about these fields.

To write audit trail information to a different file on a disk or on a magnetic tape volume set, define the system logical name ACMS$AUDIT_LOG to point to that file. If you omit any parts of the file specification in defining the logical name, missing parts are supplied from SYS$ERRORLOG:ACMSAUDIT.LOG. For example, the following command defines the audit trail log file as ACMSAUDIT.LOG in the directory [ACMS.AUDIT] on SYS$DISK. The file name and file type are supplied by default.

```
$ DEFINE/SYSTEM ACMS$AUDIT_LOG SYS$DISK:[ACMS.AUDIT]
```

Note the logical must be a system logical so that the Audit Trail Logger has access to it.

If you write audit trail information to a file on disk, take the steps needed to process audit trail log files as ACMS creates them. For example, you can purge audit trail log files or store them on a separate volume.

If the Audit Trail Logger runs out of space for audit trail information on disk, the audit trail logs the error in the software event log (generated by SWL), and the Audit Trail Logger process stops. ACMS sends a message to ACMS operator terminals. Restart the Audit Trail Logger process with the **ACMS/SET SYSTEM /AUDIT** command or the **ACMS/RESET AUDIT** command.

If you write audit trail information to a magnetic tape volume set, define the logical name ACMS$AUDIT_LOG to point to a file specification of the form:

```
MTxn:name.ext
```

The components of this file specification are:

- MT – Device type for a magnetic tape drive
- x – Controller code for the tape drive
- n – Unit number of the tape drive
- name – File name for the log file
- ext – File type for the log file

The following command defines ACMS$AUDIT_LOG to point to ACMSAUDIT.LOG on the magnetic tape mounted on the MTA0 device:

```
$ DEFINE /SYSTEM ACMS$AUDIT_LOG MTA0:
```

The default file name and file type are taken from the file specification SYS$ERRORLOG:ACMSAUDIT.LOG.

If you write audit trail information to magnetic tape, load and initialize the magnetic tape before you start the ACMS system. If you do not, the **ACMS/START SYSTEM** command can time out before the initialization is complete. Initialize the magnetic tape with a volume name the same as the first six characters of the file name for the audit trail log file. For example:

```
$ INIT MTA0: ACMSAU
```

If the file name is longer than six characters, the Audit Trail Logger truncates the volume name to six characters. Do not use the **MOUNT** command after initializing the tape. ACMS logically mounts the magnetic tape when it starts the Audit Trail Logger. If the tape is already mounted, ACMS returns a fatal error on the **ACMS/START SYSTEM** command.

If the Audit Trail Logger is logging information to magnetic tape, and the end of volume is encountered, OpenVMS sends a message to OpenVMS operator terminals asking the operator to mount the next volume in the volume set. The operator loads the tape on the drive, initializes and mounts the volume, and responds to the operator request with a DCL **REPLY** command. The Audit Trail Logger then logs information to the new volume.

Note

If the audit trail log file is being written to magnetic tape that runs out of space, ACMS may interrupt its work until a new tape is ready. OpenVMS operator terminals are informed that a new tape must be mounted. Eventually, terminal users do not get any system response. To avoid this problem, store your audit information on large magnetic tapes. Inspect the tape regularly to make sure that it is not full.

For information about magnetic tapes, see *VSI OpenVMS System Manager's Manual, Volume 1: Essentials* [https://docs.vmssoftware.com/vsi-openvms-system-manager-s-manual-volume-1-essentials/]. For information about the **REPLY** command, see the *VSI OpenVMS DCL Dictionary: N–Z* [https://docs.vmssoftware.com/vsi-openvms-dcl-dictionary-n-z/].

12.3. Events Recorded by the Audit Trail Logger

The Audit Trail Logger logs the following types of events:

- Flagged events – Events flagged when auditing is enabled using the application-level AUDIT clause or subclause, or with the AUDIT keyword in ACMS operator commands.
- Default events – Events that the Audit Trail Logger logs regardless of application definition or operator command. *Table 12.1, "Events Logged by the Audit Trail Logger"* marks default events in the "When Recorded" column with the word "Always".

Table 12.1, "Events Logged by the Audit Trail Logger" shows the events logged by the Audit Trail Logger, an explanation of recorded events, and the conditions under which events are recorded.

Table 12.1. Events Logged by the Audit Trail Logger

Events Recorded	Explanation	When Recorded
Abnormal terminations of applications	Stopping of applications for any reason other than **ACMS/STOP SYSTEM** or **ACMS/STOP APPLICATION** commands	Always
Abnormal terminations of server processes	Stopping of server processes due to error	Always
ACMS errors	ACMS system internal errors	Always
Application starts and stops	Each use of **ACMS/START APPLICATION** and **ACMS/STOP APPLICATION** commands	Always
Application modifications	Each use of the **ACMS/MODIFY APPLICATION** command	Application auditing enabled

Events Recorded	Explanation	When Recorded
Open new audit trail log file	Each use of an **ACMS/RESET AUDIT** command	Always
Enabling and disabling of the Audit Trail Logger	Each use of the **ACMS/SET SYSTEM**, **ACMS/START SYSTEM**, or **ACMS/STOP SYSTEM** command to enable or disable the Audit Trail Logger	Always
Enabling and disabling of ACMS operator terminals	Each use of the **ACMS/SET SYSTEM** command to enable or disable ACMS operator terminal	Always
Error allocating ACMS-controlled terminals	Why an ACMS-controlled terminal was unable to be allocated by the ACMS terminal subsystem controller	Always
Errors returned or signaled by cancel handling procedures	Each error encountered by user-written cancel handlers	Always
Errors returned or signaled on initialization and termination procedures	Each error encountered by user-written initialization and termination procedures	Always
Errors signaled by processing steps	Each error signaled during a processing step	Always
Failure to start a server process	Why a server process failed to start	Always
Sign-ins and sign-outs	Who signed in to or out of ACMS and at what time	Always
Queue starts and stops	Each use of the **ACMS/START QUEUE**, or **ACMS/STOP QUEUE** commands	Always
Queue modifications	Each use of the **ACMS/SET QUEUE** command	Always
Queued task failures	Each error that caused the task invocation to fail	Always
Server replacement	Each use of the **ACMS/REPLACE SERVER** command	Always
System starts and stops	Each use of **ACMS/START SYSTEM** or **ACMS/STOP SYSTEM** command	Always
Task calls	Tasks called by other tasks	Task subclause
Task chains	Tasks chained to from another task	Task auditing enabled
Task cancellations	Tasks canceled by any method	Task auditing enabled
Composed task transaction aborts	When a composed task transaction was aborted	Always
Task completions	Completed tasks, who completed each task, and when	Always
Task selections	Each task selected by a user	Task auditing enabled

Events Recorded	Explanation	When Recorded
User errors not elsewhere reported	User errors, including errors ACMS cannot report back to the user	Always
Submitter authentications in remote applications	As a security measure, when a submitter first selects a task in a remote application, the submitter is authenticated by the application execution controller (ACC) on the submitter node	Always

Use ATR commands to read the events recorded in the audit trail log file or to produce a report that lists the events. The following sections describe how to run the ATR Utility and use ATR commands.

12.4. Running the ATR Utility

Use either of the following commands to run ATR:

```
$ RUN SYS$SYSTEM:ACMSATR
ATR>
```

or

```
$ MCR ACMSATR
ATR>
```

You can also enter ATR Utility commands from DCL level by defining ATR as a DCL foreign command. For example:

```
$ ATR:==$SYS$SYSTEM:ACMSATR
```

Place this command in your login command file to permanently define this foreign command. Once you define ATR as a DCL foreign command, you can use ATR commands from DCL. For example:

```
$ ATR LIST /APPLICATION=EXEX_APPL /BEFORE=14-JAN-1991
```

When you see the ATR> prompt, enter ATR commands. Use the **LIST** command to display or list audit trail records. Use the **HELP** command to get information about ATR commands. For example:

```
ATR> HELP LIST
```

Instead of typing ATR commands, you can use keypad keys to enter commands. Press **PF1** and **PF2** for access to the ATR keypad. Press **Ctrl/B** to recall the last 20 ATR commands you enter (one at a time).

When you are finished using the ATR Utility, type EXIT or press **Ctrl/Z** to return to DCL:

```
ATR> EXIT
$
```

In DCL, get help information about the ATR Utility by using the following **HELP** command:

```
$ HELP @ACMSATR
```

12.5. Creating Log Reports

The ATR Utility **LIST** command generates an ACMS log report consisting of records from the Audit Trail Logger. Include a file specification with the **LIST** command to identify

a concatenated file containing several audit trail log files, or omit the file specification altogether. If you omit the file specification, ATR searches for a translation for the logical ACMS$AUDIT_LOG. If ACMS$AUDIT_LOG is not defined, ATR uses the default file specification, SYS$ERRORLOG:ACMSAUDIT.LOG.

12.5.1. Creating Full Log Reports

The **LIST** command with the **/OUTPUT** qualifier writes full Audit Trail Logger reports to a listing file. If you do not use the **/OUTPUT** qualifier, the ATR Utility displays information on the terminal.

Example 12.1, "ATR LIST Command" provides an sample log report containing a full version of each record in the audit trail log file. Instead of displaying the entire log file on your terminal as shown here, use the **/OUTPUT** qualifier to send the output to a listing file.

Example 12.1. ATR LIST Command

```
ATR> LIST
❶      ACMS Log Report   5-JAN-1991  ❷10:08:08.83
       Type   : ALL
       Since  : *
       Before : *
       Appl   : *
       Task   : *          ❸
       ID     : *
       User   : *
       Sub    : *
       Term   : *
❹     File   : SYS$SYSROOT:[SYSERR]ACMSAUDIT.LOG;3

       ************************************************************

❺     Type   :
 TASK
❻     Time   :  1-JAN-1991 12:16:55.00s
❼     Appl   : TEST
❽     Task   : TSK1M2
❾     User   : LTUSER2
❿    ID     : CARAT::00010036-00000001-47E6F8C0-008DDDDE
⓫    Sub    : CARAT::00010036-00000000-47E6F8C0-008DDDDE
⓬    Text   : Task started
       ************************************************************)


       Type   : TASK      Time   :  1-JAN-1991 12:17:19.06
       Appl   : TEST
       Task   : TSK1M2
       User   : LTUSER2
       ID     : CARAT::00010036-00000001-47E6F8C0-008DDDDE
       Sub    : CARAT::00010036-00000000-47E6F8C0-008DDDDE
       Text   : Task end
       Task completion status:  Task completed normally
       ************************************************************
⓭      End Report   1-JAN-1991 13:09:01.41
```

The following is a description of the numbered items in *Example 12.1, "ATR LIST Command"*.

❶ ACMS Log Report

The name of the report.

❷ Date and time

The date and starting time for processing the report.

❸ The criteria for selecting the records in the report. An asterisk (*) indicates that you did not use a criterion to select records. "ALL " indicates that you did not select records by record type.

❹ File

The information included to identify the source file, including the file name or file specification.

❺ Type

The type of information in the record.

❻ Time

The time the record was created.

❼ Appl

The application name for an active task.

❽ Task

The name of the active task.

❾ User

The OpenVMS user name of the user who submitted the task.

❿ ID

The ACMS task identification code for one task instance.

⓫ Sub

The ACMS task submitter identification code for an ACMS user running a task.

⓬ Text

A description of the event recorded.

⓭ End Report

The date and time that report processing concluded.

12.5.2. Creating Brief Log Reports

The **/BRIEF** qualifier limits how much information is included in the report. Each record in a brief report contains the time of the entry in the Audit Trail Logger and the type of information in the entry. For information about record types, see the description of the **/TYPE** qualifier. The default is to include

full records in the report. *Example 12.2, "ATR LIST/BRIEF Command"* provides an example of an ACMS log report containing a brief version of each record in the Audit Trail Logger.

Example 12.2. ATR LIST/BRIEF Command

```
ATR> LIST/BRIEF
❶       ACMS Log Report   5-JAN-1991 ❷  10:01:02.74
        Type   : ALL
        Since  : *
        Before : *
        Appl   : *
        Task   : *          ❸
        ID     : *
        User   : *
        Sub    : *
        Term   : *
❹        File   : SYS$ERRORLOG:RWGAUDIT.LOG;3

        ************************************************************
        Type   : OTHER     Time   :  1-JAN-1991 11:57:35.03
        Type   : COMMAND   Time   :  1-JAN-1991 11:57:42.97
        Type   : COMMAND   Time   :  1-JAN-1991 11:59:05.42
        Type   : LOGIN     Time   :  1-JAN-1991 11:59:34.61
        Type   : LOGIN     Time   :  1-JAN-1991 11:59:35.63
        Type   : LOGIN     Time   :  1-JAN-1991 11:59:42.04
        Type   : LOGIN     Time   :  1-JAN-1991 11:59:43.05
        Type   : TASK      Time   :  1-JAN-1991 12:00:55.00
        Type   : TASK      Time   :  1-JAN-1991 12:00:55.92      ❺
        Type   : TASK      Time   :  1-JAN-1991 12:01:06.52
        Type   : TASK      Time   :  1-JAN-1991 12:01:09.39
        Type   : LOGIN     Time   :  1-JAN-1991 12:02:15.76
        Type   : TASK      Time   :  1-JAN-1991 12:02:16.53
        Type   : TASK      Time   :  1-JAN-1991 12:02:18.22
        Type   : LOGIN     Time   :  1-JAN-1991 12:02:19.82
        Type   : TASK      Time   :  1-JAN-1991 12:02:19.87
        Type   : LOGIN     Time   :  1-JAN-1991 12:02:19.98
        Type   : TASK      Time   :  1-JAN-1991 12:02:20.81
        Type   : TASK      Time   :  1-JAN-1991 12:02:22.15
❻        End Report   5-JAN-1991 10:01:58.42
```

A brief log report consists of a header and one or more records. The following is a description of the numbered items in *Example 12.2, "ATR LIST/BRIEF Command"*.

❶ ACMS Log Report

The name of the report.

❷ Date and time

The starting date and time for processing the report.

❸ The criteria for selecting the records in the report. An asterisk (*) indicates that you did not use a criterion to select records. "ALL " indicates that you did not select records by record type.

❹ File

The information included to identify the source file, including the file name or file specification.

❺ Type

A listing of all records that meet your selection criteria. If you do not use qualifiers to select records for the report, the report contains all records in the input file.

❻ End Report

The time report processing concluded.

12.6. Selecting Audit Trail Records

Use **LIST** command qualifiers to select records from the Audit Trail Logger. Which qualifier or qualifiers you use depends on the kind of application or task information you want or on how much information you want.

The **/SINCE** and **/BEFORE** qualifiers let you select records by time range. The **/APPLICATION**, **/IDENTIFICATION**, **/SUBMITTER**, **/TASK**, **/TERMINAL**, **/TYPE**, and **/USERNAME** qualifiers each select records containing the information you include on the qualifier. For example, the **/APPLICATION** qualifier selects records containing the application name you include. Combinations of qualifiers further restrict the information in the report.

12.6.1. Selecting Records by Submitter and Task Identification Code

Every submitter that signs in to ACMS receives a submitter identification code, or **submitter ID**, that ACMS associates with the submitter until the submitter signs out. Every submitter ID is unique. Similarly, each task instance receives a task identification code, or **task ID**, that is also unique.

Use submitter and task IDs with operator commands and with the ATR **LIST** command. Submitter and task IDs on command qualifiers limit the scope of the command you use. For example, a submitter ID on the **/SUBMITTER** qualifier of the **LIST** command defines which audit trail records are extracted from the audit trail log.

Both a submitter ID and a task ID have the following format:

A called task ID has the following format:

For example, this is a submitter ID:

```
CARAT::0455002C-00000000-F7B46260-008DEB44
```

This is a task ID:

```
MYOHMY::0001002F-00000017-F7B46260-008DEB44
```

This is the task ID of a called task:

```
MYOHMY::0001002F-00000017-F7B46260-008DEB44-00000001
```

The sequence number in a submitter ID is always zero. A dash (–) separates boot-time fields for readability, but both fields are considered one field. A task ID is the same as the task submitter's submitter ID, except that the sequence number field contains a hexadecimal number that is incremented for each task selection.

If a task is a called task (that is, a task called by another task) the task ID contains an additional field called the task-call field. The task call field is a hexadecimal number that is incremented each time a task calls another task. This field is only displayed for tasks called by other tasks.

Because the boot-time field is useful mainly in the Audit Trail Logger, ACMS does not display this field when you use ACMS operator commands. Because the sequence number field of a submitter ID is always zero, ACMS does not display the sequence number field either. The ACMS operator command display formats of the IDs are:

- Submitter ID display format:

  For example:

  ```
  NODE1::0455002C
  ```

- Task ID display format:

  node::local-id-sequence-number-task-call

  For example:

  ```
  NODE1::0455002C-0000001A-00000001
  ```

When you specify a submitter or task ID with an operator or ATR Utility command, any of the fields that you do not specify are implicitly wildcarded. A dash (–) separates fields, such as local-id and sequence-no, to allow you to omit leading fields. You can omit leading zeros in any of the fields, except the node field.

To see all current task instances submitted by task submitters on node ROW that are executing on your node, specify just the node name on the **/SUBMITTER** qualifier of the **ACMS/SHOW TASK** command. For example:

```
$ ACMS/SHOW TASK/SUBMITTER=ROW::
```

To see what the first task selection was for each submitter in an Audit Trail Logger, specify only the sequence number field on the **/IDENTIFIER** qualifier of the **LIST** command. Because you are not specifying the local ID field, indicate that you are omitting that leading field by using a dash. For example:

```
ATR> LIST/IDENTIFIER=-1
```

When you specify a full task ID, the report only contains records generated by that particular task.

12.6.2. Selecting Application Information

Use the **/APPLICATION** qualifier to create an audit log report of only application information.

12.6.3. Selecting Task Information

These qualifiers return information about ACMS tasks:

- **/APPLICATION**
- **/BEFORE**
- **/IDENTIFICATION**

- **/SINCE**
- **/TYPE**

The **LIST** command with the **/TYPE=TASK** qualifier causes the ATR Utility to display information about all tasks. Use the **/IDENTIFICATION** qualifier to display information about a particular task by specifying the task ID. See *Section 12.6.1, "Selecting Records by Submitter and Task Identification Code"* for information on specifying a task ID. You can use more than one of these qualifiers on the **LIST** command to select information. For example, the **/TASK** qualifier and the **/BEFORE** and **/SINCE** qualifiers return information about tasks in a time range.

Example 12.3, "Using the LIST/TYPE=TASK Command to Display Task Information" provides output from the **LIST/TYPE=TASK** command. It includes records about two different tasks: DBMS_SINGLE_TASK is a task in the TESTB application and TSK0101R is a task in the TESTB application.

Example 12.3. Using the LIST/TYPE=TASK Command to Display Task Information

```
ATR> LIST/TYPE=TASK
❶    ACMS Log Report   4-JAN-1991    ❷  16:05:08.02
      Type   : TASK
      Since  : *
      Before : *
      Appl   : *
      Task   : *            ❸
      ID     : *
      User   : *
      Sub    : *
      Term   : *
❹   File   : SYS$SYSROOT:[SYSERR]ACMSAUDIT.LOG;3
      ************************************************************
❺    Type   : TASK     ❻ Time   :  1-JAN-1991
 13:50:59.58
❼    Appl   :
 TESTB
❽    Task   :
 DBMS_SINGLE_TASK
❾    User   :
 LTUSER28
❿   ID     :
 CARAT::00010045-0000000A-38A21C80-008DDDE5
⓫   Sub    :
 CARAT::00010045-00000000-38A21C80-008DDDE5
⓬   Text   : Task started
      ************************************************************
      Type   : TASK         Time   :  1-JAN-1991 13:51:34.88     Appl
   : TESTB          Task   : TSK0101R      User   : LTUSER46
   ID     : CARAT::0001005B-00000013-38A21C80-008DDDE5      Sub    :
 CARAT::0001005B-00000000-38A21C80-008DDDE5      Text   : Task started
 ************************************************************

     Type   : TASK         Time   :  1-JAN-1991 13:50:59.58
     Appl   : TESTB
     Task   : DBMS_SINGLE_TASK
     User   : LTUSER28
     ID     : CARAT::00010045-0000000A-38A21C80-008DDDE5
     Sub    : CARAT::00010045-00000000-38A21C80-008DDDE5
```

```
    Text   : Task end
⓭ Task completion status: Task completed normally
    ************************************************************
    Type   : TASK         Time   :  1-JAN-1991 13:51:34.88
    Appl   : TESTB
    Task   : TSK0101R
    User   : LTUSER46
    ID     : CARAT::0001005B-00000013-38A21C80-008DDDE5
    Sub    : CARAT::0001005B-00000000-38A21C80-008DDDE5
    Text   : Task end
    Task completion status: Task completed normally
    ************************************************************
    End Report  1-JAN-1991 14:10:40.27
```

❶ ACMS Log Report

The name of the report.

❷ Date and time

The date and starting time for processing the report.

❸ The criteria for selecting the records in the report. An asterisk (*) indicates that you did not use a criterion to select records. "ALL " indicates that you did not select records by record type.

❹ File

The information you included to identify the source file, including the file name or file specification.

❺ Type

Type of audit record.

❻ Time

Date and time the record was written.

❼ Appl

Application name.

❽ Task

Task name.

❾ User

User name of the task submitter.

❿ ID

Task ID.

⓫ Sub

Submitter ID.

⓬ Text

Message text.

⓭ Task completion status

Additional status text.

Use the **/TASK** qualifier to list information about particular tasks. The following command lists information about all tasks with the name DBMS_SINGLE_TASK:

```
ATR> LIST/TASK=DBMS_SINGLE_TASK
```

If more than one application has a task with the name TSK0101R, use the **/APPLICATION** qualifier with the **/TASK** qualifier to return information about only one of these tasks. For example:

```
ATR> LIST/TASK=TSK0101R /APPLICATION=TESTB
```

To return records involving only a particular task instance, use the **/IDENTIFICATION** qualifier. You only have to enter the node name and the first two long words to uniquely identify a task instance. This example uses the task identification code for the DBMS_SINGLE_TASK task from *Example 12.3, "Using the LIST/TYPE=TASK Command to Display Task Information"*:

```
ATR> LIST/IDENTIFICATION=CARAT::10045-A
```

This example shows how you can drop leading and trailing zeros from task identification codes; however, do not drop significant digits.

12.6.4. Selecting User Information

These qualifiers return information about ACMS users:

- **/SUBMITTER**
- **/TERMINAL**
- **/TYPE=LOGIN**
- **/USERNAME**

You can use more than one qualifier on a **LIST** command to return information. For example, to return information about sign-ins and sign-outs under one user name, use the **/USERNAME** qualifier and the **/TYPE** qualifier with the LOGIN keyword. *Example 12.4, "ATR LIST/USERNAME/TYPE Command"* shows some sample output from a **LIST** command with these qualifiers.

Example 12.4. ATR LIST/USERNAME/TYPE Command

```
ATR> LIST/USERNAME=PERSONNEL/TYPE=LOGIN
❶   ACMS Log Report   4-JAN-1991 ❷ 15:24:49.88
     Type   : LOGIN
     Since  : *
     Before : *
     Appl   : *
     Task   : *              ❸
     ID     : *
     User   : PERSONNEL
     Sub    : *
```

```
     Term   : *
❹    File   : SYS$SYSROOT:[SYSERR]ACMSAUDIT.LOG;3
     ************************************************************
❺    Type   : LOGIN       ❻   Time   :  1-JAN-1991
 13:04:50.16
❼    User   : PERSONNEL   ❽   Term   :
 TTA4:
❾    Sub    : ALLDAY::00020036-00000000-
BCC34BC0-008DDDE4
❿   Text   : Login request
     ************************************************************
     Type   : LOGIN             Time   :  1-JAN-1991 13:04:55.95
     User   : PERSONNEL         Term   : TTA5:
     Sub    : ALLDAY::00270001-00000000-BCC34BC0-008DDDE4
     Text   : Login request
     ************************************************************
     Type   : LOGIN             Time   :  1-JAN-1991 13:05:19.05
     User   : PERSONNEL         Term   : TTA4:
     Sub    : ALLDAY::00020036-00000000-BCC34BC0-008DDDE4
     Text   : Successful login
     ************************************************************
     Type   : LOGIN             Time   :  1-JAN-1991 13:05:25.25
     User   : PERSONNEL         Term   : TTA5:
     Sub    : ALLDAY::00270001-00000000-BCC34BC0-008DDDE4
     Text   : Successful login
     ************************************************************
⓫    End Report   4-JAN-1991 15:32:35.86
```

❶ ACMS Log Report

Name of the report.

❷ Date and time

The date and starting time for processing the report.

❸ Criteria for selecting the records in the report. An asterisk (*) indicates that you did not use a criterion to select records. "ALL " indicates that you did not select records by record type.

❹ File

Information you included to identify the source file, including the file name or file specification.

❺ Type

Type of audit record.

❻ Time

Date and time the record was written.

❼ User

User name of the task submitter.

❽ Term

Device name.

❾ Sub

Submitter ID.

❿ Text

Message text.

⓫ End Report

Date and time report processing concluded.

The display contains all records of sign-ins or sign-outs involving the user name PERSONNEL from the current version of the Audit Trail Logger.

Qualifiers let you find a small number of user records in the Audit Trail Logger containing the task submitter identification code from that session.

Example 12.4, "ATR LIST/USERNAME/TYPE Command" contains two task submitter identification codes:

- ALLDAY::00020036-00000000-BCC34BC0-008DDDE4
- ALLDAY::00270001-00000000-BCC34BC0-008DDDE4

To display all records involving the user session identified by this submitter identification, use the following command:

```
ATR> LIST/SUBMITTER=ALLDAY::20036
```

You have to type only the node name and the first longword to uniquely identify a submitter. You can even omit leading zeros from the first long word to make entry easier.

Example 12.4, "ATR LIST/USERNAME/TYPE Command" contains records of sign-ins at two terminals: TTA4 and TTA5. To list sign-ins and sign-outs at the ACMS-controlled terminal TTA4, use the following command:

```
ATR> LIST/TERMINAL=TTA4:
```

12.6.5. Creating an Audit Trail Record for the QTI Process

The Audit Trail Logger audits all ACMS operator commands that start, stop, or set the QTI or ACMS task queues. In addition, the Audit Trail Logger records all task invocations which fail. The audit trail record of failed task invocations shows the following:

- The error that caused the task invocation to fail
- What the QTI has done with the queued task element

Example 12.5, "QTI Audit Entry" shows a sample QTI audit entry.

Example 12.5. QTI Audit Entry

```
*******************************************************************************
Type   : ERROR     Time   :  6-APR-1991 13:04:31.81
Queue  : KEV_QUE
ErrQue :
```

```
Text   : Error processing queued task
-ACMSQUE-E-ERRREADQ, Error reading the queue file
-SYSTEM-F-ACCVIO, access violation, reason mask=00, virtual address=010E0007,
PC=000009B0, PSL=5F56454B
******************************************************************************
Type   : ERROR     Time   :  6-APR-1991 13:04:36.44
Queue  : KEV_QUE
ErrQue :
Appl   : SWISS
Task   : CHEESE
User   : MCCARTHY
Elem Id: 218001A3-00000002-D9F83F60-00910F15
Text   : Error processing queued task
-ACMSQUE-E-ERRGETPROC, Error returned from ACMS$GET_PROCEDURE_INFO
-ACMS-E-NOSUCH_PKG, There is no such package defined
-ACMSQUE-I-QTRETRY, Queued task will be retried later
******************************************************************************
```

See *Chapter 8, "Controlling the ACMS System"* for information about the operator commands which control the QTI and ACMS task queues. See *Chapter 5, "Creating and Managing Queues"* for information about managing task queues and queued task elements.

12.6.6. Creating an Audit Trail Record for Application Modification

When you enable application-level auditing and use the **ACMS/MODIFY APPLICATION** command, the audit trail records any application modifications you make in the Audit Trail Logger. As described in *Chapter 9, "Installing and Managing Applications"*, you can use the **ACMS/MODIFY APPLICATION** command to modify task, application, or server attributes in active applications. *Example 12.6, "Application Modification Audit Entry"* contains an audit trail record recording a change in the maximum number of task instances allowed in application AIR_REGISTER.

Example 12.6. Application Modification Audit Entry

```
*****************************************************************
Type   : COMMAND   Time   : 26-JAN-1991 16:52:38.00
Appl   : AIR_REGISTER
User   : KINK
Text   : Attributes for application AIR_REGISTER have been modified
Maximum number of task instances has been changed to 5
*****************************************************************
```

See *Chapter 9, "Installing and Managing Applications"* for information about the **ACMS/MODIFY APPLICATION** command.

12.6.7. Creating an Audit Trail Record for Server Process Dump

If server process dumps have been enabled in the application definition and the server process stops unexpectedly, an OpenVMS process dump is generated and the event is recorded in an audit trail record. *Example 12.7, "Server Process Dump Audit Entry"* is an example of an audit trail record containing server process dump information.

Example 12.7. Server Process Dump Audit Entry

```
*************************************************************
```

```
Type   : ERROR     Time    : 27-JAN-1991 09:46:04.95
Appl   : SANDAPPL  Text    : Server process death has generated a VMS
 process dump
Process dump for server PROC_DUMP_SRV is
      DISK1$:[TWEP.TEST]PROC_DUMP_SRV.DMP;
************************************************************
```

Example 12.8, "Server Process Dump Failure Audit Entry" contains an example of an audit trail record generated when the attempt to generate a server process dump failed.

Example 12.8. Server Process Dump Failure Audit Entry

```
************************************************************
Type   : ERROR     Time    : 27-JAN-1991 09:48:26.95
Appl   : SANDAPPL  Text    : Server process death has generated a VMS
 process dump
Error writing process dump for server PROC_DUMP_SRV to
      SYS$SYSROOT:[SYSERR]PROC_DUMP_SRV.DMP; Insufficient privilege or
 file protection violation
************************************************************
```

See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for information about enabling server process dumps.

12.6.8. Audit Trail Record for Server Replacement

When you use the **ACMS/REPLACE SERVER** command to replace a server image in an application with a new version of that image, the event is recorded in the Audit Trail Logger. *Example 12.9, "Server Replacement Audit Entry"* is an example of an audit report generated by a server replacement.

Example 12.9. Server Replacement Audit Entry

```
************************************************************
Type   : COMMAND   Time    : 26-JAN-1991 14:58:53.52
Appl   : RULES_REGS
User   : SANDY
Text   : Replace Server
Replace server command issued for RULES_REGS
************************************************************
```

For more information on the **ACMS/REPLACE SERVER** command, see *Chapter 9, "Installing and Managing Applications"*.

12.6.9. Creating an Audit Trail Record for Insufficient Workspace Pool

If a user initiates a task, but the application execution controller (EXC) is unable to allocate sufficient memory for the task, the user receives an error and the event is recorded in the Audit Trail Logger. *Example 12.10, "Insufficient Workspace Audit Entry"* shows an example of an audit trail record generated by insufficient workspace space.

Example 12.10. Insufficient Workspace Audit Entry

```
************************************************************************
Type   : TASK Time    : 26-JAN-1991 14:58:53.52
```

```
Appl   : ORDER_ENTRY
Task   : ORDER_ENTRY_TASK
User   : OPER_42
ID     : NODEA::00050021-00000002-3D208320-009113BE
Sub    : NODEA::00050021-00000000-3D208320-009113BE
Text   : Task start failed during initialization
Error starting task: Unable to allocate workspace resources, please try later
%ACMSWSP-E-ERRCTLPOO, Error allocating 132 bytes in TWSC pool 3 for workspaces
%ACMSPOO-E-POOL_EXHAUSTED, Insufficient free memory available for request
********************************************************************************
```

See *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"* for information about the causes of workspace pool allocation failures and how to correct such errors.

12.7. Auditing the System

As a security measure, when an application receives the first task selection from a submitter, the application requests submitter authentication from the ACMS Central Controller (ACC) on the submitter node. This authentication checking ensures that malicious code cannot claim to be a valid submitter. If the application is on a node that is different from the node of the submitter (for example, a remote task selection), then auditing occurs on both the submitter and an application node. The audit trail record indicates the success or failure of task submitter attempts to select a task in a remote application. System authentication auditing provides a way to track the task activity of a task submitter selecting tasks in remote applications.

The following sections describe authentication auditing on submitter and application nodes.

12.7.1. Auditing on the Submitter Node

When the ACC on a submitter node authenticates a submitter for a remote application, an "authentication provided or rejected " record is audited. Here is an example of such a record:

```
********************************************************************
Type   : LOGIN     Time   : 11-JUL-1991 09:23:24.73
User   : JONES     Term   : LTA38:
Sub    : CARAT::00020033-00000000-1323F040-008E2DEB
Text   : Authentication provided to node CARAT for application PAYROLL
********************************************************************
```

This record indicates that on the submitter node (JONES) was authenticated for task selections in the remote application (PAYROLL on node CARAT).

Because the Audit Trail Logger audits remote task selections on the application node and not the submitter node, the Audit Trail Logger on a submitter node does not show task selections in remote applications. The record includes a pointer to the application node. The Audit Trail Logger on that application node can help you track task activity.

This record can indicate that either a submitter was not authenticated or was not signed in. Records that show a submitter was not authenticated may indicate that an unauthorized user tried to select a task. Records that show a submitter was not signed in may indicate that the submitter was canceled after a task selection was initiated to a remote application. An example of a record where the authentication was rejected follows:

```
********************************************************************
Type   : LOGIN     Time   : 11-JUL-1991 09:23:24.73
User   :           Term   :
```

```
Sub    : CARAT::00020033-00000000-1323F040-008E2DEB
Text   : Authentication rejected to node CARAT for application PAYROLL
-ACMSACC-W-SUBNOTAUTH, Unable to authenticate submitter
******************************************************************
```

12.7.2. Auditing on the Application Node

When an application receives a task selection from a remote submitter for the first time, the application asks the ACC on the submitter node for submitter authentication. The Audit Trail Logger audits this request as an "authentication request " record. An example of such a record is shown in *Example 12.11, "Authentication Request Record"*.

Example 12.11. Authentication Request Record

```
************************************************************
Type   : LOGIN     Time   : 11-JUL-1991 09:23:23.66
User   :           Term   :
Sub    : CARAT::00020033-00000000-1323F040-008E2DEB
Text   : Submitter authentication request for application PAYROLL
************************************************************
```

The authentication request record includes the submitter ID and the application that requests authentication.

After ACC on the submitter node authenticates the submitter, then an authentication success or failure record is audited. *Example 12.12, "Authentication Success Record"* contains an example of an audited success record for the application PAYROLL.

Example 12.12. Authentication Success Record

```
************************************************************************
❶ Type   : LOGIN       ❷ Time   : 11-JUL-1991 09:23:25.86
❸ User   : ACMS_USER    ❹ Term   : NL:
❺ Sub    : CARAT::00020033-00000000-1323F040-008E2DEB
❻ Text   : Successful submitter authentication for application PAYROLL
           of submitter CARAT::JONES
************************************************************************
```

The following is a description of the numbered items in *Example 12.12, "Authentication Success Record"*.

❶ Type

Is the type of information in the record.

❷ Time

Specifies the time the record was created.

❸ User

Displays the user name associated with the remote submitter. The user name helps determine the access rights of the submitter (ACMS_USER) for all task selections in the application (tasks run as though they were selected by a local submitter with this user name). The user name is either an OpenVMS proxy or, if an OpenVMS proxy is not found, the default submitter user name (USERNAME_DEFAULT) as specified in ACMSGEN. See *Chapter 6, "Using Distributed Forms Processing"* for more information about authorizing remote access to ACMS applications.

❹ Term

Includes the login device associated with the submitter. For remote submitters, this device is used for display purposes only and is always NL.

❺ Sub

Includes the submitter ID assigned to the submitter upon sign-in. See *Section 12.6.1, "Selecting Records by Submitter and Task Identification Code"* for more information about submitter and task identification codes.

❻ Text

Shows the node and remote user name of the task submitter (CARAT::JONES). It also shows the application that authenticated the submitter (PAYROLL).

An authentication failure record indicates that ACMS was unable to authenticate the submitter and that the submitter was denied access to the application. *Example 12.13, "Audited Authentication Failure Record"* contains an example of an authentication failure record.

Example 12.13. Audited Authentication Failure Record

```
******************************************************************
Type    : LOGIN      Time    : 11-JUL-1991 09:23:25.86
User    :            Term    :
Sub     : CARAT::00020033-00000000-1323F040-008E2DEB
Text    : Unsuccessful submitter authentication for application PAYROLL
-SYSTEM-F-NOLINKS, maximum network logical links exceeded
******************************************************************
```

Authentication can fail for these reasons:

- There is no proxy for the remote submitter and no default submitter user name.
- The application cannot send the authentication request message to the submitter node because of a resource failure, as when maximum links for DECnet are exceeded.

12.7.3. Auditing on Remote Nodes

When a known ACMS system on a remote node fails or is terminated, the failure or termination event is audited. A known remote ACMS system is one that is either a submitter node (submitters on the remote system are accessing applications on the local node) or an application node (submitters on the local system are accessing applications on the remote node).

The following is an example of a termination event:

```
******************************************************
Type    : COMMAND    Time    : 16-FEB-1991 16:54:57.15
Text    : Remote system stopped on node MARAT
******************************************************
```

The following is an example of a failure event:

```
******************************************************************
Type    : ERROR      Time    : 16-FEB-1991 16:57:19.37
Text    : Remote system no longer accessible on node CORDAY
```

```
-SYSTEM-F-THIRDPARTY, network logical link disconnected by a third party
**************************************************************************
```

12.8. System Messages from Other Products

ATR cannot translate message codes from any product other than TDMS or ACMS. Messages from products other than these are reported by message number. For example:

```
message number 000288664f
```

You can, however, cause ATR to translate messages from other products by using the DCL **SET MESSAGE** command and specifying the name of the product's system message file. For example:

```
$ SET MESSAGE SYS$MESSAGE:DBMMSG.EXE
```

To find out the name of another product's system message file, see the documentation for that product.

Note

It is possible to see the following error when issuing an ATR command:

```
%RMS-E-FNF, file not found
```

This error message may be caused by insufficient privileges on the audit trail log file, even though the log file specified in the command is in the SYS$ERRORLOG directory.

12.9. Summary of the ATR Commands and Qualifiers

ATR commands help you create reports that include information in the audit trail log file. *Table 12.2, "Summary of ATR Commands"* lists the ATR commands and qualifiers and provides a brief description of each of the ATR commands. For a detailed description of the ATR commands and qualifiers, see *Chapter 23, "ATR Commands"*.

Table 12.2. Summary of ATR Commands

Commands and Qualifiers	Description
EXIT	Ends the ATR session and returns you to the DCL prompt.
HELP /[NO]PROMPT	Provides online information about ATR commands.
LIST /APPLICATION=*appl-name* /BEFORE[=*time*] /BRIEF /IDENTIFICATION=*task-id* /OUTPUT=*file-spec* /SINCE[=*time*] /SUBMITTER=*submitter-id* /TASK=*task-name* /TERMINAL=*device-name*	Displays or lists information from a source file. The output of this command is an ACMS log report consisting of audit trail records. With qualifiers, you can select the records to be included in the report.

Commands and Qualifiers	Description
/TYPE=*type* /USERNAME=*user-name*	

Chapter 13. Logging Software Events

This chapter describes the ACMS Software Event Logger (SWL) and tells you how to use Software Event Log Utility Program (SWLUP) commands to generate reports containing SWL error information. See *Section 13.3, "Summary of SWLUP Commands and Qualifiers"* for a summary of SWLUP commands and qualifiers. For reference information on the commands described in this chapter, refer to *Chapter 24, "SWLUP Commands"*.

13.1. How SWLUP Works

The SWL records internal software errors that occur during the execution of ACMS application programs. The SWL is part of the ACMS software installed on your system and is typically started automatically when you start ACMS. If you find that the SWL is not logging events, start the SWL by executing the ACMS startup procedure SYS$MANAGER:ACMSTART.COM. For example:

```
$ @SYS$MANAGER:ACMSTART.COM
```

SWL writes all event messages and software errors to the SWL log file. Each time an error occurs, ACMS writes a message to the SWL log file with the following information:

- System absolute time
- Process ID (PID)
- Process image name
- User name
- Process name
- Process UIC
- Program processor status longword at the time of the call
- Program counter of the event log routine call
- Standard OpenVMS condition code
- Extended error information

The default SWL log file is SYS$ERRORLOG:SWL.LOG. To redirect the location of the SWL log file, use the logical name ACMS$SWL_LOG. You must define this logical as an executive mode system logical in order for the SWL process to create the file in an alternative location.

When you use this logical name, any pieces of the file specification contained in the equivalence name are used. Parts of the file specification not used take the SYS$ERRORLOG:SWL.LOG default.

If the use of the logical name results in a file that cannot be opened (for example, because of an incorrect directory or device), then SWL opens the SYS$ERRORLOG:SWL.LOG. If this happens, SWL also writes a message to the SWL log describing the problem with the logical name.

To read information in the SWL log file, you use SWLUP commands. SWLUP command qualifiers allow you to select information that appears in the report. For example, you can specify the following SWLUP command to list all software errors occurring before April 25, 1994.

```
SWLUP> LIST/SINCE=25-APR-1994
```

When you list your reports, specify an output file with the **/OUTPUT** qualifier, or let the output default to SYS$OUTPUT.

Use the **/INPUT** qualifier to cause SWLUP to read a file specification other than the default SWL log file or one specified by the logical name ACMS$SWL_LOG. If you do not use the **/INPUT** qualifier, SWLUP uses either the default SWL log file specification, or one specified by the logical name.

13.2. How to Run SWLUP

Use either of the following commands to run SWLUP:

```
$ RUN SYS$SYSTEM:SWLUP
SWLUP>
```

or

```
$ MCR SWLUP
SWLUP>
```

When you see the SWLUP> prompt, begin entering SWLUP commands. For example:

```
SWLUP> LIST/PROCESS_NAME=AT_HOME/SEVERITY=W,E/OUTPUT=AT_HOME.LIS
```

Use the **HELP** command to access online help information about SWLUP commands and qualifiers. Press **PF1** then **PF2** for access to a keypad of SWLUP commands. Press **Ctrl/B** to recall each SWLUP command you enter. To exit from SWLUP, use the **EXIT** command or press **Ctrl/Z**.

Enter SWLUP commands from DCL level by using the following command to define SWLUP as a foreign command. When you enter this command interactively, you define SWLUP as a foreign command only for your current process. To define SWLUP as a foreign command permanently, place this command in your login command file:

```
$ SWLUP:==$SYS$SYSTEM:SWLUP
```

Once you define SWL as a foreign command, use SWLUP commands from DCL by preceding each command with the characters "SWLUP ". For example:

```
$ SWLUP LIST
```

Note

It is possible to see the following error when issuing a SWLUP command:

```
%RMS-E-FNF, file not found
```

This error message may be caused by insufficient privileges on the SWL log file, even though the log file specified in the command is in the SYS$ERRORLOG directory.

13.3. Summary of SWLUP Commands and Qualifiers

Table 13.1, "Summary of SWLUP Commands" provides a brief description of each of the SWLUP commands and lists the qualifiers for each command. For a complete description of the SWLUP commands and qualifiers, see *Chapter 24, "SWLUP Commands"*.

Table 13.1. Summary of SWLUP Commands

Commands and Qualifiers	Description
@ (At sign)	Runs an indirect command file that contains SWLUP commands.
EDIT	Lets you edit the last SWLUP command you typed and lets you create an edit buffer into which you can enter SWLUP commands.
EXIT	Causes SWLUP to exit or ends the execution of a command file.
HELP /[NO]PROMPT	Provides online information about SWLUP commands.
LIST [EVENTS] /BEFORE[=*time*] /EVENT_CODE=*event-code* /FACILITY=*facility-name* /IMAGE=*image-name* /INPUT=*file-spec* /OUTPUT=*file-spec* /PRINT /PROCESS_NAME=*process-name* /SEVERITY=*severity-code* /SINCE[=*time*] /USER=*user-name*	Lists information selected by command qualifiers.
RENEW	Starts a new systemwide SWL log file.
SAVE	Writes the last command you typed to a file.
SET [NO]LOG	Enables or disables logging of any commands you type during a SWLUP session.
SET [NO]VERIFY	Enables or disables the printing of commands stored in an indirect command file. SWLUP sends output to your terminal.
SHOW CURRENT	Displays the name of the current log file opened by the SWL detached process.
SHOW LOG	Displays whether or not you are currently logging SWLUP commands and names the log file.
SHOW VERSION	Displays the current version of SWLUP on your terminal.
STOP	Stops the Software Event Logger detached process so that it can exit properly.

Chapter 14. Tuning Your Application

This chapter discusses the major issues in ACMS application performance, ACMS processes that affect system performance, and tools for monitoring your system. This chapter also provides a tuning checklist.

14.1. Major Issues in ACMS Application Performance

Sometimes performance issues are a matter of tuning the application and the system as a whole. For example, modifying SYSGEN and ACMSGEN parameters to ensure that ACMS processes have the resources they need can have a significant effect on the performance of both the application and the entire ACMS system. Take the following steps when tuning an ACMS system:

1. Ensure that ACMS processes have the resources they need, by doing such things as setting the working set size of the Application Execution Controller (EXC) to an appropriate value to decrease paging.
2. Ensure that limits to system resources, such as lookaside lists (preallocated pieces of dynamic memory for terminal I/O or network I/O) or global pages, do not cause sudden delays in processing. An inadequate lookaside list could:
   - Cause the ACMS system or task to hang
   - Prevent new users from signing in
   - Cause non-ACMS processes to stop
   - Exhaust dynamic memory
   - Exhaust workspace pools

   Although there is no way to predetermine the correct size for lookaside lists, you can determine adequate limits by routinely observing the ACMS system with the DCL **SHOW MEMORY** command, the OpenVMS Monitor Utility, or the Software Performance Monitor (SPM) software.
3. Ensure there is enough memory so that ACMS control processes are not subject to swapping.
4. Determine the optimal number of server processes for each server, minimizing the time that servers wait for tasks and that tasks wait for servers. Then, change the application definition to set the minimum and maximum values for server process count to their optional numbers. This eliminates excessive server process creation and deletion.
5. Determine whether or not you can trade off resources to benefit the work of most importance at the expense, if necessary, of other activities. For example, you can:
   - Use servers of lower priority for less important work
   - Require certain processing work, such as computations, to be run in batch mode
   - Set limits on the number of ACMS users and applications to ensure that resources are available on the system for other non-ACMS work

Most of the quotas and SYSGEN parameters established during post-installation are sufficient for your ACMS system. You might have to change them, however, if you modify your hardware, add or delete an application, or change the number of users on your system. If you change SYSGEN parameters or for some reason the system resources are insufficient, the ACMS system might notify you with an error message, or it might not have sufficient resources to send an error message.

The best way to determine the optimal settings for parameters is to monitor your system regularly and establish some base numbers to work with. Only through regular monitoring can you recognize normal and abnormal activity, the effect of different workloads on the system, and changes in throughput rates. Also, by monitoring your system before and after making changes to it, you can measure the effects of the change against a predefined goal.

14.2. Monitoring Tools

Tuning involves collecting and reporting on system processes to improve performance. A number of tools are available that can help you collect information about an active ACMS system and applications:

- ACMS **SHOW** commands

  The displays returned by these commands, especially by **ACMS/SHOW APPLICATION** and **ACMS/SHOW APPLICATION/CONTINUOUS**, provide information you can use to determine the optimal number of server processes required for your ACMS system. By examining the number of tasks waiting for servers and servers waiting for tasks, you can determine whether some servers are not being used, or too many servers are being created to meet increased demand. See *Chapter 9, "Installing and Managing Applications"* for a detailed discussion about these ACMS **SHOW** commands.

  In setting the minimum server processes, set the value as high as necessary to prevent the too frequent creation of additional server processes during the time of peak application use. Also set the value as low as you can to conserve memory. Once you have determined the optimal setting for the minimum value, you can set the maximum to that same value, to ensure that no additional servers are created, even at times of peak application load. Users queue for the available servers instead. See *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/] for more information about using ADU to set the optimal number of server processes.

- ACMS Audit Trail Logger

  The task selections logged in the Audit Trail Logger can help you determine which tasks are most heavily used and the times of heaviest use. This can be useful in determining how to modify an application. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for a detailed discussion on the ACMS Audit Trail Logger and audit trail log files.

- OpenVMS Monitor Utility and DCL **SHOW** commands

  The OpenVMS Monitor Utility and the DCL **SHOW** commands are two important performance management tools provided with the OpenVMS operating system.

  The OpenVMS Monitor Utility returns information that can help identify and isolate resources causing either ACMS or system-level problems: inadequate values for small request packets (SRP), I/O request packets (IRP), and large request packets (LRP), for example, or inadequate values for paged and nonpaged pool. The paging information is useful in determining appropriate working set sizes for ACMS processes. See *VSI OpenVMS System Management Utilities Reference Manual, Volume II: M–Z* [https://docs.vmssoftware.com/vsi-openvms-system-management-utilities-reference-manual-volume-ii-m-z/] for information about the OpenVMS Monitor Utility.

The **SHOW** commands display the current status of a process, the system, and the devices on the system. Use the **SHOW MEMORY** command, for example, to ensure there is adequate memory available to prevent swapping of the ACMS control processes. See *VSI OpenVMS DCL Dictionary: N–Z* [https://docs.vmssoftware.com/vsi-openvms-dcl-dictionary-n-z/] for information on the DCL **SHOW** commands.

- Software Performance Monitor (SPM)

  The SPM is an OpenVMS layered product that provides information on resource usage. SPM is particularly useful in determining working set sizes. Because the CPU cost of running SPM is low, it is a good tool for gathering routine performance information. Also, SPM provides extensive tools for reporting the data it gathers. The SPM reports can provide significant help in identifying and solving performance problems. SPM's graphic representation of the information gathered makes it easier to identify performance problems than with MONITOR. See the documentation provided with SPM for more information on this product.

- DEC/Test Manager (DTM)

  The DTM is an OpenVMS layered product that is most useful for regression and functional testing. DTM can also be useful in setting up a controlled simulation of application activity to allow you to isolate a performance problem. DTM allows you to have multiple processes on the same CPU run the same script, simulating multiple ACMS users. Although the resources DTM requires can affect the overall performance of the system, this controlled simulation can help you determine which resources are being used. See DTM documentation for more information on this product.

These tools can help identify areas in which adjustment of SYSGEN parameters or user name characteristics can improve ACMS or overall system performance.

14.3. ACMS Processes that Affect Performance

These processes control the ACMS system:

- ACMS Central Controller (ACC)
- Terminal Subsystem Controller (TSC)
- Command Process (CP)
- Application Execution Controller (EXC)
- Server Process
- Audit Trail Logger
- Queued Task Initiator (QTI)

Of these processes, the CP, EXC, and server process have the greatest effect on the performance of an application. In addition, the QTI process has a very significant effect on the performance of the ACMS Queued Task Facility.

The CP handles all ACMS sign-ins and ACMS menu displays, performs exchange steps for distributed applications, and interprets commands issued at the ACMS menu level. The EXC controls all server

processes and handles all exchange steps for local applications. The server process handles all of the processing step work for an application, including all database I/O and computational work. The QTI dequeues queued task elements from one or more task queues and initiates queued tasks in ACMS applications.

Minimizing the number of ACMS processes without overloading them while providing them sufficient system resources results in the best performance. Since most of the ACMS processes control many users, they need larger working sets to function than a typical interactive process. For the same reason, set the OpenVMS priority of the ACMS processes at least as high as that of an interactive process.

14.4. Configuration of Hardware

This section discusses how the various processes and procedures of an ACMS system use the different components of a computer system. If you understand how ACMS uses memory, CPU power, and disk I/O, you can make better choices about how much and what kind of hardware you need. The section also includes a sample configuration suitable for distributed applications.

A properly configured computer system consists of three elements:

- Main memory sufficient to contain the working sets of active processes, thus minimizing paging and swapping
- CPU power sufficient to support operating system requirements and to carry out computation required by the application fast enough to sustain desired throughput
- Disks sufficient in size to store data, application sources, and images, and sufficient in number and speed to support I/O throughput of the application

Before proceeding with plans for hardware configuration, have a clear understanding of requirements in terms of application size, database requirements, and expected performance. Estimates of hardware requirements are much more meaningful if based on observation of an existing application, such as a prototype. All estimates should be based on peak load, not average load.

Note

Estimates based on the discussion in this section are entirely dependent on the nature of the application, and should not be regarded as recommendations. Use your estimates in consultation with VSI support.

14.4.1. Estimating Memory Requirements

When you estimate how much memory your configuration should include, estimate the memory required for the operating system plus the working set sizes of all the processes in your application. The working set size for a process must be sufficient to avoid excessive page faulting.

To estimate how much memory OpenVMS uses, start with a base figure for OpenVMS itself and operating system processes such as ERRFMT, OPCOM, and JOB_CONTROL. Include additional memory for application processes. Remember to include the memory needs of layered products installed on your system, such as DATATRIEVE, TDMS, and COBOL.

When determining the amount of memory each application process needs, consider two factors: the number of global pages and the number of process-private pages. **Global** pages are pages that can be shared among several similar processes, and should only be counted once. **Process-private** pages are specific to a single process and should be counted for each process. The OpenVMS

MONITOR PROCESS command can assist you in determining global and process-private pages for the processes you need to consider. Monitor a prototype application to estimate memory needs.

For an ACMS application, the following processes need to be considered when estimating required memory:

- ACC

  There is one ACC on your computer. The ACC is the central control point for the ACMS system.

- CPs

  How many Command Processes is your system going to run? Broadly speaking, you can count on 1 CP for every 20 users.

- EXC

  Consider both global pages used by the EXC and process-private pages needed by each user of the application. The amount of memory is determined by the number of active tasks, but at this level of estimation, the number of users is more likely to be known than the number of active tasks. If this process is short of memory, the performance of the application is adversely affected.

- Servers

  Include sufficient working sets for each server and for the processing work being done in the server. Memory requirements are determined by the code you write for the processing work, as well as the database management system you use.

- Non-ACMS processes

  Include global and process-private pages for any non-ACMS processes that may be running on your system.

Add up all of your estimates for an estimate of the total memory required for your application.

You can refine your requirements after the hardware configuration is in place and the system is up and running. *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* discusses means of monitoring and tuning memory usage for your system. It also contains information helpful in calculating quotas and parameters for the processes discussed in this section.

14.4.2. Estimating CPU Requirements

How big a CPU does your application require? Performance is almost always spoken of in terms of throughput, the rate of processing computer computations. For example, the number of transactions per second is a measure of the speed at which the system works. The performance of an ACMS system is determined by the size and power of the CPU and the specifics of your application design.

ACMS applications conserve CPU energy more than traditional applications because of the way in which ACMS applications share resources. For example, the server initialization procedure binds the database once for a server process that serves many users. This puts less load on the CPU than a traditional timesharing application, in which each user binds the database in individual processes.

An ACMS application can take an existing image, remove the database binds, and put them into an initialization procedure. The resulting image runs in a single-step task. The performance gains are impressive, even before the image is converted to a multiple-step task.

An ACMS application needs to create fewer server processes and to activate fewer images for a group of users than a traditional application, because the task group shares resources among many users. Also, the ACMS use of specialized processes to share memory among many users reduces memory management overhead, another factor in CPU usage.

The design of a task also has an effect on CPU usage. Avoiding scrolled regions and the processing required to map a large array to a TDMS form were discussed in the section on the user interface for the multiple-step task. Database access methods also affect CPU usage. Use DATATRIEVE, RDO, or DBQ to prototype your database access methods, and observe the effect of various methods on CPU usage. Because of the cost of communicating group and user workspaces from server process for computation to Command Process for I/O, the use of such workspaces often requires more CPU resources than the benefits of such use warrants. Take the costs of communication and server use into account as you estimate the size of CPU required for your application.

You may have different CPU requirements, depending on whether throughput or best response time is your primary goal. To get maximum throughput and best response time, you may need more CPU power than for just maximum throughput. Response time increases as the limit of CPU capacity (maximum throughput) is reached.

Again, it is useful to monitor a prototype and to determine from that the additional CPU power required for the fully implemented system.

14.4.3. Estimating Disk Requirements

Applications that are suitable for development with ACMS tend to be I/O-intensive, requiring a significant amount of disk resources. Update and inquiry tasks against a database, for example, use more disk I/O than an application doing scientific computation, which is a heavy user of CPU power.

When determining how many and what kind of disks you need for your hardware, take these factors into account:

- How much data, application, and operating system space is required
- What disks support the I/O throughput required by your system

Determining the number and type of disks needed to support your I/O throughput requirements depends on a number of factors. You need to understand the throughput rate of the disks you are considering. How many I/O requests per second can the disk process before applications have to begin queuing for disk access? The rate varies widely depending on the type of disk and the kind of I/O your application does – for example, whether it is synchronous or asynchronous. The database management system in use also affects the rate of I/O throughput.

Factors in disk configuration specific to ACMS include the location of the audit trail log file. Determine the location of this file by defining the logical name ACMS$AUDIT_LOG before you start up the ACMS system. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for a discussion of the audit trail log file. Be careful not to locate this file on the same disk as your DBMS root file, or Rdb database file, or the file where the index of an RMS indexed file is located. The Audit Trail Logger should not have to contend with database processing for access to the same disk.

You can create a prototype of the database access involved in your application and monitor the I/O requirements. Use DATATRIEVE, RDO, or DBQ to model the transactions you plan to include in your application, and use the DCL command **MONITOR/DISK** to observe the actual I/O rate. Proceeding from observed rates of I/O throughput in the prototype can help you figure out what the disk requirements are when the system is fully implemented.

Once you have an idea of I/O requests per transaction and the desired processing throughput rate in terms of transactions per second, multiply the two figures together to get the total I/O rate. Divide the total I/O rate by the I/O throughput rate of the disk you are considering, and you should have an idea of how many disks you need to support the I/O throughput you require for your application.

```
((requests/transaction * transactions/second) / throughput rate) = disks
```

Keep in mind that:

- For good response time, the I/O throughput rate must be less than the disk's maximum capacity.
- There may be limits imposed on the I/O throughput by your database management system.

14.5. Configuring the Command Process

The CP handles many users at one time. The performance of the CP depends on the number of users it must control and the rate at which those users are selecting menus or tasks. The number of users that the CP controls is determined by the ACMSGEN parameter MAX_TTS_CP.

To determine whether or not the CP is configured properly, monitor one of the command processes during peak hour conditions using the DCL command **SHOW PROCESS/CONTINUOUS**. If the CP remains idle for long periods of time, it may be able to handle more users. Allowing it to control more users reduces the number of Command Processes ACMS needs and also the amount of system resources ACMS uses.

If the CP remains in a computable state for a period of time, it may be overloaded. An overloaded CP can make menu displays and response time seem slow to the users. When this is the case, reduce the number of terminals the CP controls by changing the TERMINALS_PER_CP parameter in the ACMVARINI.DAT file and running the ACMSPARAM.COM procedure. See *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* for information about running ACMSPARAM.COM.

If the CP seems to be paging heavily, its working set might be set too low. When this is the case, increase the working set size for the CP using the OpenVMS Authorize Utility. Restricting the CP by limiting its working set can result in poor performance for all the users it controls.

Another source of poor CP performance might be the priority at which the CP is running. The ACMSGEN parameter CP_PRIORITY controls the priority at which the CP runs. Set this value at least as high as an interactive user's priority.

As much as possible, perform such adjustments using the ACMSPARAM.COM procedure rather than the ACMSGEN Utility because ACMSPARAM adjusts other related parameters automatically. In some instances, such as adjusting dynamic system parameters, it might be necessary to use ACMSGEN (see *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"*).

14.6. Configuring the Application Execution Controller

The performance of the EXC process depends on the rate at which exchange steps are being executed and the complexity of the TDMS requests. Although there is a single EXC process for each application, the EXC process is normally able to handle all users of an application.

Insufficient working sets or an OpenVMS process priority that is too low for the EXC user name can significantly reduce the performance of the application. The EXC might require considerably more system resources than a typical interactive process because it controls many users at one time.

SPM can be used to monitor page faults in the EXC at the time of peak load periods. You can also use the DCL **SHOW PROCESS/CONTINUOUS** command, but restrict its usage to short periods of time because the command affects overall system performance.

Set the resource quotas for the EXC process on an individual basis using the ACMEXCPAR.COM command procedure (see *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"*). Each EXC process performs a specific function and requires specific resources to perform properly.

The application definitions created with ADU set up the user names under which the EXC controllers run. Use the OpenVMS Authorize Utility to change the working set size and priority for the user name of each EXC, if necessary. By using the OpenVMS Authorize Utility to change the priority and quotas associated with these user names, you can change the performance of the applications and the ACMS system. See the OpenVMS Authorize Utility documentation for more information. *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/] contains information on using ADU application definition clauses.

14.7. Configuring the Server Process

The performance of the server processes for an application depends mainly on how you define them in the application definition. The number of server processes available to an application can affect its performance. If too many servers are active, system resources are wasted. If too few servers are active, users might have to wait long periods of time before ACMS can allocate a server process to their application.

To determine whether or not there are enough server processes on the system for a particular application, use the ACMS **/SHOW APPLICATION** command. This command shows how many servers are active, how many users are waiting for server processes, and how many servers are busy. This information indicates whether or not there are enough servers on the system.

To change the operational characteristics of server processes, use the ADU and the OpenVMS Authorize Utility. The application definitions created with ADU include clauses that determine how many resources the application uses. For example, the MAXIMUM SERVER PROCESSES clause sets an upper limit for all server processes in an application.

An application definition also sets up the user names under which server processes and Application Execution Controllers run. By using the OpenVMS Authorize Utility to change the priority or quotas associated with these user names, you can change the performance of the applications and of the ACMS system. See the OpenVMS documentation on the Authorize Utility for more information. *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/] contains information on using ADU application definition clauses.

14.8. Tuning and Maintaining the Queued Task Facility

The performance of the QTI is affected by:

- The configuration of the process
- The number of concurrent task execution threads

In addition, the performance of the QTI as well as the performance of processes which call the Queued Task Services, is affected by:

- The RMS tuning variables associated with the task queue files
- Proper maintenance of the task queue files

14.8.1. Configuring the QTI Process

The performance of the QTI is affected by how the process is configured. In particular, the performance is mainly affected by:

- The OpenVMS process priority
- The working set size

Specify the OpenVMS process priority with the ACMSGEN QTI_PRIORITY parameter. Depending on your application, you may want the QTI to run at the same priority as processes serving interactive users (for example, the CP), or you may want the QTI to run at a lower priority than interactive users (similar to a batch process).

Specify the user name of the QTI with the ACMSGEN parameter QTI_USERNAME. This user name, and the quotas for this user name, are defined in the system user authorization file (SYSUAF.DAT) using the OpenVMS Authorize Utility. Ensure that the working set size of the QTI is sufficient so that it does not page excessively.

Use the ACMSPARAM.COM procedure (see *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"*) to define the user name of the QTI. This command procedure determines the quotas needed by the QTI depending on application-specific data which you provide. In addition, ACMSPARAM.COM will set the working set size to a reasonable first guess. Monitor the QTI during peak times to determine if the working set size requires adjusting.

14.8.2. QTI Task Execution Threads

When you start a task queue with the **ACMS/START QUEUE** operator command, you can specify the number of task execution threads using the **/TASK_THREADS** qualifier. By default, if you do not specify this qualifier, one task execution thread per queue is allocated to each started queue.

The number of task execution threads controls how many task invocations can be outstanding at any one time. With multiple task execution threads, the dequeuing of queued task elements and the invocation of queued tasks occur concurrently. Therefore, when you increase the number of threads, you increase the throughput. As you increase the number of threads, the QTI uses more system resources such as CPU and disk I/Os. Therefore, balance the usage of these resources as needed among other components of your application.

If you have multiple queues being processed by the QTI, then you can favor one queue over other queues by assigning it more task execution threads.

The rate at which the QTI processes elements of one queue relative to another queue is a function of the number of task threads per queue and the time it takes to execute the queued tasks. Each QTI task thread does its processing loops (dequeue element, invoke queued task) independently of any other thread. Therefore, you have to consider the time delay of the tasks which are being invoked when trying to calculate the rate at which elements are processed in one queue relative to another queue.

For example, assume you have started the task queues MY_QUE and YOUR_QUE, and MY_QUE is assigned one task execution thread and YOUR_QUE is assigned two task threads. If the execution time of the tasks in the two queues is the same, there will be twice as many queued task elements processed

in YOUR_QUE than in MY_QUE. If, however, the execution time of the tasks in MY_QUE is twice as long as those in YOUR_QUE, then there will be four times as many queued task elements processed in YOUR_QUE than in MY_QUE.

Although it is possible to specify up to 255 task execution threads per queue, normally you specify a relatively small number. After a certain point, increasing the number of task execution threads does not increase throughput. Each task execution thread consumes memory and requires higher process quotas. Therefore, increasing the number of task execution threads beyond a certain point only wastes these resources. In practice, specifying 1 to 10 task execution threads is sufficient to meet your needs.

14.8.3. Tuning Task Queue Files

The ACMS Queued Task Facility is layered on RMS. Specifically, each task queue repository is an RMS indexed file. Therefore, tune task files just as you would any RMS indexed file.

The steps you use to modify RMS tuning variables associated with the task queue file are:

1. Generate a File Definition Language (.FDL) file for an existing task queue repository by using the DCL **ANALYZE/RMS_FILE/FDL** command.

   For example, assume you have created a task queue using the ACMS Queue Manager and the file specification associated with the task queue is SYS$SYSTEM:PAYROLL_QUEUE.DAT. Generate an .FDL file by issuing the following command:

   ```
   $ ANALYZE/RMS_FILE/FDL SYS$SYSTEM:PAYROLL_QUEUE.DAT
   ```

2. Modify the RMS tuning variables in the .FDL file as needed by using the EDIT/FDL Utility.

   For example, using the .FDL file generated from the example in the previous step, invoke the EDIT/FDL Utility with:

   ```
   $ EDIT/FDL PAYROLL_QUEUE.FDL
   ```

   From within the EDIT/FDL Utility, modify the RMS tuning variables as needed. ACMS uses the RMS defaults for all the tuning variables. Specific tuning variables which you might want to modify depending on your application include:

   - Initial file allocation
   - Contiguity
   - Default file extension quantity
   - Multibuffer
   - Bucket size
   - Global buffers

   For more information on tuning RMS indexed files, see the OpenVMS documentation on RMS.

3. Convert the queued task repository file by using the Convert Utility on the .FDL file from the previous step:

   ```
   $ CONVERT/FDL=PAYROLL_QUEUE SYS$SYSTEM:PAYROLL_QUEUE.DAT -
   _$ SYS$SYSTEM:PAYROLL_QUEUE.DAT
   ```

The Convert Utility generates a new queued task repository file having a higher version number than the original queued task repository file. The Queued Task Facility depends on the original file version. Therefore, you must delete the original file and rename the new converted file to have the old version number. For example:

```
$ PURGE SYS$SYSTEM:PAYROLL_QUEUE.DAT
$ RENAME SYS$SYSTEM:PAYROLL_QUEUE.DAT; ;1
```

For more information on the ANALYZE/RMS_FILE Utility, the EDIT/FDL Utility, and the Convert Utility, see *Guide to OpenVMS File Applications*.

14.8.4. Maintaining Task Queue Files

The ACMS Queued Task Facility is layered on RMS indexed files. In a running application, elements are enqueued to a task queue, and at some later point in time they are dequeued. These operations translate to write and delete operations on the RMS indexed file. RMS retains buckets in indexed files even if all the records in the bucket have been deleted.

Over time, these empty buckets can accumulate and needlessly waste disk space. In addition, these empty buckets can cause a performance degradation of the QTI process if your application uses multiple priority levels of queued task elements and the highest priority in the task queue changes frequently.

Use the Convert or Convert/Reclaim Utilities on the task queue repository files to reclaim these unused buckets. If you use the Convert Utility, you also need to rename the new task queue repository file to have the original version number. For more information on the Convert and Convert/Reclaim Utilities, see *Guide to OpenVMS File Applications*.

Perform this file maintenance on a regular basis. Because the Convert Utilities require exclusive access to the file, you need to perform this maintenance during a time when your application needs little access to the queue file.

14.9. Tuning Checklist

Use the following checklist to establish a sound management routine that helps you maintain good performance on your ACMS system.

1. As system manager, routinely:

   - Use ACMSPARAM.COM and ACMEXCPAR.COM after installations or upgrades to set system parameters, privileges, and quotas. Also run ACMSPARAM and ACMEXCPAR after modifying the ACMS environment, for example, if you add or delete an application or change the number of terminal devices.
   - Establish realistic standards for system performance by monitoring your system on a regular basis.
   - Understand the workload and capacity of your system so you can recognize normal and abnormal performance.
   - Observe how peak load times and complex applications affect ACMS performance.
   - Avoid performance complaints by notifying users of anticipated workload changes that might slow down the system.

2. Use tuning as a last resort to solve a performance problem:

   - If a performance problem arises, investigate the possible causes using the various OpenVMS and ACMS monitoring tools.
   - If a performance problem persists, compare the current throughput rates with those rates established during "normal" operations.
   - Before adjusting system parameters, look for other, simpler solutions, for example, balancing workload peaks by running some jobs as batch jobs at nonpeak times.

3. If you find that you must tune your system by adjusting system parameters:

   - Use the ACMSPARAM.COM and ACMEXCPAR.COM command procedures instead of ACMSGEN. These procedures automatically adjust all other configuration-related parameters to suit your ACMS configuration.
   - Limit the values you adjust to a few at a time and measure their effect against a predefined goal.

4. After you make adjustments:

   - Plan on monitoring your system to ensure that the adjustments have improved ACMS performance.
   - If tuning has not improved performance, stop tuning and reevaluate the situation. The cause of the problem may lie in other areas, including the application design or database design.

Chapter 15. Using DECtrace with ACMS Applications

DECtrace is a product that collects and reports on event-based data gathered from any combination of OpenVMS layered products and application programs. If DECtrace is installed on your system, you can use it to collect detailed information about applications that use the ACMS software.

15.1. Overview of DECtrace

DECtrace refers to layered products and applications as **facilities**. DECtrace allows layered products, such as ACMS and Rdb, to define **events**. ACMS has many predefined events that occur at run time. An event can have a start and an end **(duration event)**, or it can simply occur **(point event)**.

Because DECtrace is event-based, it provides you with several advantages:

- An easy way to collect and report on the resources utilized by predefined events in an application.
- A way to determine the frequency of execution of events, rather than an average or estimated frequency.
- Response time measurement on both submitter and application nodes
- Logging of processing steps that execute called tasks
- Message compression measurement

DECtrace records several different pieces of information, called **items**, for each event. Items can be:

- Resource utilization items such as CPU time
- ACMS data items such as the task name, associated with ACMS events
- Cross facility items used to relate event data from one facility to another

Section 15.3.1, "Describing ACMS Events and Items" contains descriptions of ACMS events and items.

To use the DECtrace commands, preface them with the keyword **COLLECT** . For example:

```
$ COLLECT SHOW VERSION
DECtrace Version V1.2-0
$
```

For better user interface performance, you can enter the DECtrace command environment by entering the **COLLECT** command with no arguments at the DCL prompt. DECtrace prompts you for commands until you return to DCL command level by entering the **EXIT** command. This eliminates binding to the history and administration databases for each command. For example:

```
$ COLLECT
DECtrace> SHOW VERSION
DECtrace Version V1.2-0
DECtrace> EXIT
$
```

15.2. Improving Application Management with DECtrace

DECtrace records information about specific events or items within the events in an ACMS application. To record this information, you simply activate the collection of the desired event data with a DECtrace command. See DECtrace documentation for more information.

You can use DECtrace for a variety of application or system management functions:

- Resource use

  For example, use DECtrace to compare the speed of an arithmetic computation done in a DECforms escape sequence with the same computation done in a procedure. Or, turn on DECtrace at the beginning of an exchange step and at the end of the step to see how much of the response time is network overhead.

- User information

  You can use DECtrace to trace a task or an exchange to see how fast the user gets through it, test the design of a single form or part of a form to identify areas of concern, or compare the results of two forms that gather the same information with different formats. Or, use DECtrace to count the number of tasks or forms completed by a user.

- Audit information

  Because granularity is smaller in DECtrace than in ACMS, you can get more detailed auditing information. ACMS auditing operates on the system level, while DECtrace can look at parts. For example, ACMS can indicate only that a task is started or stopped, while DECtrace can give details of parts of the task

15.3. Collecting Event Data for ACMS

To collect event data with DECtrace, you must first create a facility selection and then schedule data collection using that selection. This section describes how to create a facility selection and schedule data collection for ACMS applications.

15.3.1. Describing ACMS Events and Items

Each time a predefined event occurs in an ACMS application, and if a collection is scheduled, DECtrace records the event items in a data file. In your facility selection, you can decide to collect either all of the events and items available or a predefined subset of these events and items (called a **collection class** – see *Section 15.4.2, "Creating a Selection"*). You can use this collected data to identify information for a variety of uses such as how frequently an event occurs, what order events occur in, or how long an event takes to complete.

Note

DECtrace collects all occurrences of each event in your chosen collection class. You cannot choose individual events to record. However, you can create reports based on specified events by using the **REPORT** command. See *Section 15.5, "Creating a Report Based on Collected Data"* for information on DECtrace reporting.

Note that if you use an agent other than the one provided by ACMS, the agent must be instrumented with DECtrace service routine calls in order to collect the ACMS event data associated with that agent. The following events must be instrumented in the customer-written agent process if you want them to be collected: REMOTE_REQUEST, FORMS_ENABLE, and FORMS_REQUEST.

Each event has various items associated with it. These items include a set of standard DECtrace resource utilization items, a set of facility-specific items and a set of cross facility items. *Table 15.1, "Resource Utilization Items"* lists the standard resource utilization items. *Table 15.2, "ACMS Data Items"* lists the ACMS-specific data items. *Table 15.3, "Cross Facility Items"* lists the cross facility items.

15.3.1.1. ACMS Events

This section describes the events that can occur in your ACMS application.

TASK

A task within the application. This event is written to the data collection file by the EXC. The start event is recorded when the start call is received from the CP. The end event call is recorded immediately preceding the return call to the CP.

ACMS can log chained tasks as separate TASK events. You can use the PARENT_TASK and STEP_NAME items to identify tasks called by other tasks. If a task is not called by another task, ACMS leaves these two items blank.

EXCHANGE_STEP

An exchange step within a task. This event is written to the data collection file by the EXC. The start event is recorded at the beginning of step processing. The end event is recorded at the end of step processing.

PROCESSING_STEP

Processing step within a task. This event is written to the data collection file by the EXC when a processing step:

- Executes a procedure call
- Executes a DCL server command
- Calls another task

The start event is recorded at the beginning of step processing. The end event is recorded at the end of step processing.

REMOTE_REQUEST

Remote request terminal I/O executed by the agent process. This event is written to the data collection file by the ACMS Remote Request Server (RR). The start event is recorded whenever a TDMS request is received. The end event is recorded when the request completes.

PROCEDURE_CALL

User's server procedure in a processing step. This event is written to the data collection file by the SP. The event reflects the time and resources used by the customer-written procedure.

TASK_WAIT

Task waiting for server processes. This event is written to the data collection file by the EXC. The start event is recorded when no server is available to process the request. The end event is recorded when a server becomes available. This event is part of the PROCESSING_STEP event.

TRANSACTION

An ACMS transaction. This event is written to the data collection file by the SP or EXC. This event is started when ACMS starts a transaction and is ended upon completion of the transaction.

FORMS_ENABLE

A DECforms enable performed by the agent process. This event is written to the data collection file by the ACMS DECforms Server (VFS). The first time a user references a form, it must be enabled.

FORMS_REQUEST

A DECforms request executed by the agent process. This event is written to the data collection file by the ACMS DECforms Server (VFS). This event is recorded whenever ACMS executes a DECforms request (SEND, RECEIVE, TRANSCEIVE).

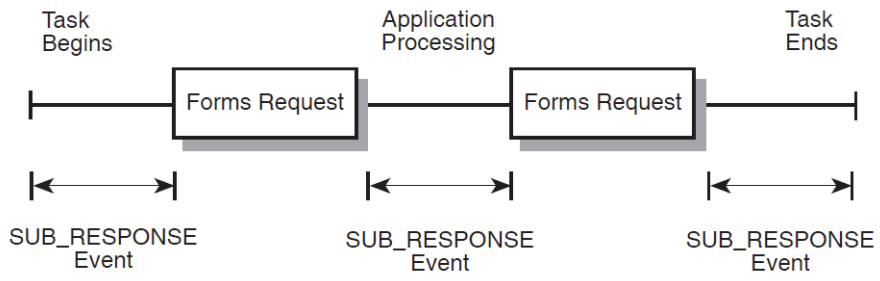
SUB_RESPONSE

The SUB_RESPONSE event is a duration event that records the time that ACMS takes to respond to a DECforms, TDMS, or stream I/O request from the submitter node, excluding the overhead associated with the forms product. This event is written to the data collection file by one of the following:

- ACMS DECforms Server (VFS)
- ACMS Remote Request Server (RR)
- Stream Services (STRM)
- Submitter Services (SUB)

ACMS logs the start of the event whenever a DECforms, TDMS, or stream I/O forms request is completed, and at the start of each task. ACMS logs the end of the event at the start of the next forms request within the same task or, if no forms request follows, when the task is completed. *Figure 15.1, "Measuring the SUB_RESPONSE Event"* shows the point at which ACMS measures the SUB_RESPONSE event: the task start, during the task, and the task end.

Figure 15.1. Measuring the SUB_RESPONSE Event



The following rules apply to the SUB_RESPONSE event for tasks with no I/O operations, tasks calling other tasks, or chained tasks:

- If a task performs no I/O operations, ACMS measures the SUB_RESPONSE event from the beginning of the task to its end. In this case, the SUB_RESPONSE event represents the time ACMS takes to respond to a menu selection.
- A SUB_RESPONSE event can continue from one task into a called task. For example, if during application processing, the current (parent) task calls another task that executes a forms request, the SUB_RESPONSE event begins during the parent task and ends during the called task. Similarly, a SUB_RESPONSE event can begin in a called task and end in the parent task.
- Task boundaries between chained tasks (those tasks started by either the REPEAT TASK or GO TO TASK clause) do not begin or end a SUB_RESPONSE event. An event started in one task continues into succeeding chained tasks until it reaches another forms request or the last task in the chain, and the task returns control to the ACMS submitter services.

The response time measured by the SUB_RESPONSE event includes the time required for network communications with the application node, and the time required for the node to perform application processing. These values are collected in the NETWORK_TIME and PROCESSING_TIME items, respectively. DECtrace records the total elapsed time for this event, and all events, by default.

However, if a SUB_RESPONSE event occurs between the final form request and the end of a task, the application node cannot send the processing time back to the submitter node. In fact, neither the NETWORK_TIME nor the PROCESSING_TIME items are available, so DECtrace collects a value of zero for both items.

Note

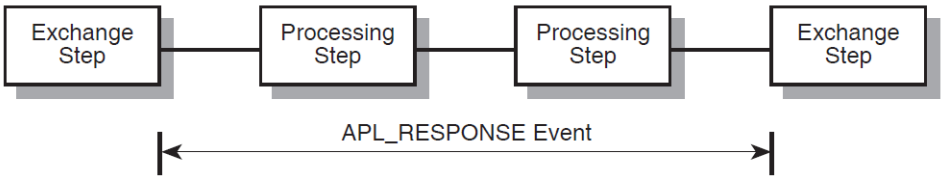
When the node name is not specified in ACMSGEN, the SUB_RESPONSE event does not log the APPL_NODE item in most cases. However, if you use TDMS or stream I/O, the SUB_RESPONSE event logs the APPL_NODE item for those operations.

APL_RESPONSE

The APL_RESPONSE event is a duration event that records the time the application node takes to respond to an exchange step, excluding the network and forms product overhead associated with the exchange step. This event is written to the data collection file by the EXC. Having a separate response time event on the back-end node allows you to make adjustments on this node and observe the effects isolated on one node.

ACMS logs the start of the event when an exchange step is completed, or, if no exchange step has executed yet within this task, ACMS logs the start of the event when the Application Execution Controller (EXC) starts the task. ACMS logs the end of the event when the next exchange step within the same task starts, or, if no exchange steps follow, when the task is completed. *Figure 15.2, "Measuring the APL_RESPONSE Event"* shows when ACMS logs the APL_RESPONSE event.

Figure 15.2. Measuring the APL_RESPONSE Event



The rules that apply to the SUB_RESPONSE event regarding tasks with no I/O operations, tasks that call other tasks, or chained tasks also apply to the APL_RESPONSE event.

COMPRESSED_MSG

The COMPRESSED_MSG event shows the effect of data compression on network messages sent between the application and submitter nodes. This event is written to the data collection file by the Stream Services (STRM) and Server Services (SER). The COMPRESSED_MSG event is a point event. The purpose of a point event is to mark the occurrence of an operation, rather than to measure the duration of the event.

The network messages contain exchange step and task argument workspace data that is communicated between the EXC process and the agent process. ACMS logs one COMPRESSED_MSG event whenever a message is transmitted or received over a network connection, and logs a second COMPRESSED_MSG event when it receives a compressed message over the network. The size of the original message and the size of the compressed message are logged, together with the compression ratio that indicates the factor by which ACMS compressed the data.

15.3.1.2. DECtrace and ACMS Items

Each event has various items associated with it. These items include a set of standard DECtrace resource utilization items and a set of facility-specific items.

Table 15.1, "Resource Utilization Items" lists the standard resource utilization items.

Table 15.1. Resource Utilization Items

Item	Description	Data type	Usage
BIO	Number of buffered I/O operations	Longword	Counter
DIO	Number of direct I/O operations	Longword	Counter
PAGEFAULTS	Total number of hard and soft page faults	Longword	Counter
PAGEFAULT_IO	Number of hard page faults (that is, page faults to or from the disk)	Longword	Counter
CPU	Total amount of CPU time in tens of milliseconds	Longword	Counter
CURRENT_PRIO	Current priority of the process	Word	Counter
VIRTUAL_SIZE	Number of virtual pages currently mapped for the process	Longword	Counter
WS_SIZE	Current working set size of the process	Longword	Counter
WS_PRIVATE	Number of pages in the working set that are private to the process	Longword	Counter
WS_GLOBAL	Number of pages in the working set that are globally shared among processes on the system	Longword	Counter

The set of standard resource utilization items is often taken as a whole. To facilitate this, the items can be referred to by the group name: RESOURCE_ITEMS.

Table 15.2, "ACMS Data Items" describes the items that are specific to ACMS.

Table 15.2. ACMS Data Items

Item	Description	Data type	Usage	When Reported
APPL_SPEC	Application specification	Fixed ASCIC(39)	Text	Start
APPL_NODE	Node name	Fixed ASCIC(15)	Text	Start
TASK_NAME	Task name	Fixed ASCIC(31)	Text	Start
STEP_NAME	Name of exchange or processing step	Fixed ASCIC(31)	Text	Start
REQ_FORM_NAME	Name of the DECforms request	Fixed ASCIC(31)	Text	Start
DEVICE_NAME	Name of user's login device	Fixed ASCIC(8)	Text	Start
PROCEDURE_INDEX	Numeric index uniquely identifying the procedure within the server	Longword	Level	Start
SERVER_NAME	Name of the server executing the procedure	Fixed ASCIC(31)	Text	Start
SEND_ID	DECforms send record ID	Fixed ASCIC(31)	Text	Start
RECEIVE_ID	DECforms receive record ID	Fixed ASCIC(31)	Text	Start
TXN_ID	Transaction ID	Fixed ASCIC(36)	Text	Start
NETWORK_TIME	The NETWORK_TIME item is the part of the response time that is spent in communications over the network between the submitter and application nodes. The NETWORK_TIME item is measured in milliseconds.	Longword	Level	End
PROCESSING_TIME	The PROCESSING_TIME item represents the part of the SUB_RESPONSE response time that is spent in processing on the application node. Together, the NETWORK_TIME and PROCESSING_TIME items make up the entire response time measured by the SUB_RESPONSE event. The PROCESSING_TIME item is measured in milliseconds.	Longword	Level	End
APL_USERNAME	The submitter's OpenVMS user name on the application node. APL_USERNAME is actually the	Fixed ASCIC(12)	Text	Start

Item	Description	Data type	Usage	When Reported
	proxy translation of the front-end OpenVMS user name. In previous versions of ACMS, this item was called the SUBMITTER_NAME item.			
SUB_USERNAME	The OpenVMS user name of the submitter, taken from the remote node. Note that the SUB_USERNAME item is not the same as the SUBMITTER_NAME item available in previous versions of ACMS.	Fixed ASCIC(12)	Text	Start
EXCH_STEP_NAME	The label of the most recently executed exchange step. For those events reported at the beginning of a task, before any exchange step has executed, this item holds the string ACMS $TASK_BEGIN.	Fixed ASCIC(31)	Text	Start
PARENT_TASK	An item used when a task is called by another task. The PARENT_TASK item holds the name of the calling task. ACMS leaves this item blank, if the TASK event is not a called task.	Fixed ASCIC(31)	Text	Start
PROC_STEP_TYPE	An item that identifies the function of a processing step. The PROC_STEP_TYPE item holds one of the following strings: • ACMS$PROCEDURE_ CALL • ACMS$DCL_SERVER • ACMS$TASK_CALL In previous versions of ACMS, PROCESSING_STEP events were logged only on steps that made procedure calls or DCL server commands.	Fixed ASCIC(20)	Text	Start
PROCEDURE_NAME	The name of the step procedure in the procedure server. The PROCEDURE_NAME item makes the final performance report easier to interpret, in comparison to the PROCEDURE_INDEX item. TDB files built with versions of ACMS previous to Version 3.3 do not contain procedure names. In this case, ACMS logs the following string to DECtrace for the PROCEDURE_NAME	Fixed ASCIC(31)	Text	Start

Item	Description	Data type	Usage	When Reported
	item:ACMS$PROCEDURE_ <procedure_index>.			
SERVER_INDEX	The numeric index of the server in the application.	Longword	Level	Start
TXN_STATUS	An identifier field that describes the final status of a DECdtm transaction. The field format is ACMS$ <vms-identifier>, where <vms-identifier> is the identifier field of a standard OpenVMS message, for example ACMS$NORMAL.	Fixed ASCIC(31)	Text	End
ORIGINAL_SIZE	A longword value that represents the size, in bytes, of a network message prior to data compression.	Longword	Level	Point
COMPRESSED_SIZE	A longword value that represents the size, in bytes, of a network message that has been compressed.	Longword	Level	Point
COMPRESSN_RATIO	A longword value that represents the percentage of data compression achieved. The compression ratio is expressed as a percentage in the range 0 to 99. A value of 0 indicates that ACMS was not able to compress the message. A value in the range 1 to 99 indicates the amount by which ACMS was able to reduce the size of the message. ACMS uses the following formula to calculate the compression ratio: RATIO=((ORIG_SIZE COMP_SIZE) / ORIG_SIZE) * 100 In the formula, ORIG_SIZE is the size of the original message and COMP_SIZE is the size of the compressed message.	Longword	Level	Point
MESSAGE_SRC	The name of the node that sends the network message.	Fixed ASCIC(15)	Text	Point
MESSAGE_DEST	The name of the node that receives the network message.	Fixed ASCIC(15)	Text	Point

15.3.1.3. DECtrace Cross Facility Items

The DECtrace **cross facility items** allow users who interpret DECtrace data to better understand the context in which certain events are executed and reported in DECtrace. The cross facility items are DECtrace items whose values can be set by one facility and then collected by any number of facilities. Use of cross facility items enables facilities that operate together to relate events in the final DECtrace

report. To relate events across facilities, the events in both facilities must collect the value of the cross facility item in common.

Table 15.3, "Cross Facility Items" lists the DECtrace cross facility items.

Table 15.3. Cross Facility Items

Item	Description	Data type	Usage
CROSS_FAC_2	Represents the ACMS SERVER_INDEX data item	Longword	Level
CROSS_FAC_7	Represents the ACMS PROCEDURE_INDEX data item	Longword	Level
CROSS_FAC_14	For general, unrestricted use.	Longword	Level

In ACMS, the PROCEDURE_CALL event collects the SERVER_INDEX (CROSS_FAC_2) and PROCEDURE_INDEX (CROSS_FAC_7) items. The PROCEDURE_CALL event is defined in the ALL, PERFORMANCE, and RESPONSE classes.

Rdb collects the CROSS_FAC_2 and CROSS_FAC_7 items during the TRANSACTION event, which is included in the Rdb PERFORMANCE, ALL and RDBEXPERT classes.

Note

Make sure that you update your Rdb facility definition with the facility definition shipped with DECtrace Version 1.2. This definition includes the CROSS_FAC_2 and CROSS_FAC_7 items for Rdb.

The DECtrace cross facility items are supported in DECtrace V1.2 or higher.

Additionally, DECtrace provides a cross facility item, CROSS_FAC_14, for general, unrestricted use. You can define this cross facility item for your application needs. ACMS includes collection of the CROSS_FAC_14 item in all events.

15.3.2. How to Use Cross Facility Items

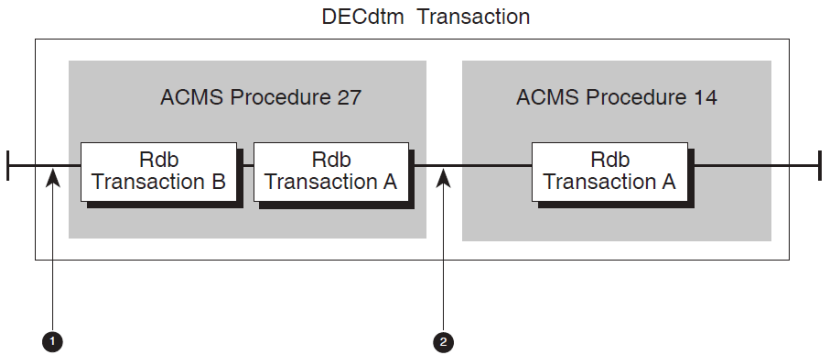
The following description and example shows how DECtrace uses cross facility items to relate the ACMS PROCEDURE_CALL event to Rdb TRANSACTION events.

Just prior to ACMS executing the start of the PROCEDURE_CALL event within the application, ACMS reports a unique identifier to DECtrace. The unique identifier is implemented using two longwords: the ACMS server and procedure indexes. DECtrace stores the longword value for the server index in the CROSS_FAC_2 item, and the value for the procedure index in the CROSS_FAC_7 item.

ACMS logs the start of the PROCEDURE_CALL event, and begins to collect the cross facility item values reported to DECtrace just prior to the start event. The same cross facility items are included in the start event collections for subsequent ACMS PROCEDURE_CALL and Rdb TRANSACTION events, until ACMS reports new values to DECtrace.

Figure 15.3, "Relating the ACMS PROCEDURE_CALL and Rdb TRANSACTION Events" illustrates two PROCEDURE_CALL events, each of which includes Rdb TRANSACTION events. The server index for both procedure calls is 5; the procedure indexes are 27 and 14, respectively.

Figure 15.3. Relating the ACMS PROCEDURE_CALL and Rdb TRANSACTION Events



In *Figure 15.3, "Relating the ACMS PROCEDURE_CALL and Rdb TRANSACTION Events"*, the following actions occur:

1. Just before ACMS executes the first procedure, the two index values, 5 and 27, are sent to DECtrace to be stored in two cross facility items. After this, start events for the first PROCEDURE_CALL and two TRANSACTION events collect these item values from DECtrace.

2. Before the second procedure begins, the indexes 5 and 14 are written to the same cross facility items, replacing their previous values. The PROCEDURE_CALL and TRANSACTION start events that follow include the cross facility item values in their data collection. This continues for all such event occurrences and, in the end, all related PROCEDURE_CALL and TRANSACTION events have these cross facility items in common.

In the final report, DECtrace relates events based on common cross facility item values. As a result, the Rdb TRANSACTION events are grouped with the appropriate ACMS PROCEDURE_CALL events in the report listing. In this way, you can distinguish which transactions are performed within Procedure 27, and which procedures initiated occurrences of Transaction A.

15.4. ACMS Collection Classes

Collection classes are made up of a predefined set of events and associated items. You can collect a set of related events, based on the class in which they are defined.

Table 15.4, "ACMS Collection Classes" summarizes the events and items collected in the ACMS collection classes.

Table 15.4. ACMS Collection Classes

Class Name	Events Collected	Items Collected[1]
ALL	All events	*
ALL_NO_CF	All events	Cross facility items are not collected
PERFORMANCE	All events, except: SUB_RESPONSE APL_RESPONSE	*
PERFORMANCE_NO_CF	All events, except: SUB_RESPONSE APL_RESPONSE	Cross facility items are not collected

Class Name	Events Collected	Items Collected[1]
RESPONSE	SUB_RESPONSE APL_RESPONSE TRANSACTION PROCESSING_STEP TASK_WAIT PROCEDURE_CALL	*
RESPONSE_NO_CF	SUB_RESPONSE APL_RESPONSE TRANSACTION PROCESSING_STEP TASK_WAIT PROCEDURE_CALL	Cross facility items are not collected

[1]Asterisk (*) indicates all items associated with these events are collected.

Table 15.5, "Events and Items Available in the ALL Collection Class for ACMS" lists the events and items that make up the ALL collection class. The ALL class is composed of the full set of events and items available for collection from a product. Note that the ALL_NO_CF class is the default class for ACMS.

Table 15.5. Events and Items Available in the ALL Collection Class for ACMS

Event	Event Type	Items
TASK	Duration	APPL_SPEC, TASK_NAME, PARENT_TASK, STEP_NAME, SUB_USERNAME, APL_USERNAME, CROSS_FAC_14
EXCHANGE_STEP	Duration	APPL_SPEC, DEVICE_NAME, REQ_FORM_NAME, STEP_NAME, TASK_NAME, SEND_ID, RECEIVE_ID, SUB_USERNAME, APL_USERNAME, CROSS_FAC_14
PROCESSING_STEP	Duration	APPL_SPEC, STEP_NAME, TASK_NAME, TXN_ID, SUB_USERNAME, APL_USERNAME, PROC_STEP_TYPE, EXCH_STEP_NAME, CROSS_FAC_14
PROCEDURE_CALL	Duration	APPL_SPEC, PROCEDURE_INDEX, SERVER_NAME, STEP_NAME, TASK_NAME, RESOURCE_ITEMS, TXN_ID, SUB_USERNAME, APL_USERNAME, PROCEDURE_NAME, SERVER_INDEX, EXCH_STEP_NAME, CROSS_FAC_2, CROSS_FAC_7, CROSS_FAC_14
REMOTE_REQUEST	Duration	APPL_NODE, APPL_SPEC, DEVICE_NAME, REQ_FORM_NAME, TASK_NAME, SUB_USERNAME, EXCH_STEP_NAME, CROSS_FAC_14
FORMS_ENABLE	Duration	APPL_NODE, APPL_SPEC, DEVICE_NAME, REQ_FORM_NAME, SUB_USERNAME, CROSS_FAC_14
FORMS_REQUEST	Duration	APPL_NODE, APPL_SPEC, DEVICE_NAME, SEND_ID, RECEIVE_ID, SUB_USERNAME, TASK_NAME, REQ_FORM_NAME, EXCH_STEP_NAME, CROSS_FAC_14

Event	Event Type	Items
TASK_WAIT	Duration	APPL_SPEC, TASK_NAME, SERVER_NAME, TXN_ID, STEP_NAME, PROCEDURE_NAME, SUB_USERNAME, APL_USERNAME, EXCH_STEP_NAME, CROSS_FAC_14
TRANSACTION	Duration	APPL_SPEC, TASK_NAME, STEP_NAME, TXN_ID, SUB_USERNAME, APL_USERNAME, TXN_STATUS, EXCH_STEP_NAME, CROSS_FAC_14
SUB_RESPONSE	Duration	APPL_NODE, APPL_SPEC, DEVICE_NAME, TASK_NAME, EXCH_STEP_NAME, NETWORK_TIME, PROCESSING_TIME, SUB_USERNAME, CROSS_FAC_14
APL_RESPONSE	Duration	APPL_SPEC, TASK_NAME, APL_USERNAME, EXCH_STEP_NAME, SUB_USERNAME, CROSS_FAC_14
COMPRESSED_MSG	Point	ORIGINAL_SIZE, COMPRESSED_SIZE, COMPRESSN_RATIO, MESSAGE_SRC, MESSAGE_DEST, CROSS_FAC_14

Table 15.6, "Events and Items Available in the PERFORMANCE Class for ACMS" lists the events and items that make up the PERFORMANCE collection class. The PERFORMANCE collection class includes events and items that are useful for applications and database tuning. DECtrace collects all items associated with events in this class.

Table 15.6. Events and Items Available in the PERFORMANCE Class for ACMS

Event	Event Type	Items[1]
TASK	Duration	*
EXCHANGE_STEP	Duration	*
PROCESSING_STEP	Duration	*
PROCEDURE_CALL	Duration	*
REMOTE_REQUEST	Duration	*
FORMS_ENABLE	Duration	*
FORMS_REQUEST	Duration	*
TASK_WAIT	Duration	*
TRANSACTION	Duration	*
COMPRESSED_MSG	Point	*

[1] * Indicates that all associated items are collected for this event.

Table 15.7, "Events and Items Available in the RESPONSE Collection Class for ACMS" lists the events and items that make up the RESPONSE collection class. The RESPONSE class groups together events and items that are commonly used in ACMS response time measurements. For each event, DECtrace collects all items associated with the event.

Table 15.7. Events and Items Available in the RESPONSE Collection Class for ACMS

Event	Event Type	Items[1]
SUB_RESPONSE	Duration	*
APL_RESPONSE	Duration	*
TRANSACTION	Duration	*
PROCESSING_STEP	Duration	*
TASK_WAIT	Duration	*
PROCEDURE_CALL	Duration	*

[1]* Indicates that all associated items are collected for this event.

15.4.1. Registering the Facility Definition

DECtrace can collect event data from a number of layered products and applications. These other products are referred to as **facilities**, and each has a facility definition registered in the DECtrace administration database.

At the installation of ACMS, the location of the ACMS facility definition depends on whether or not DECtrace is already installed on the system:

- If DECtrace installation preceded ACMS installation, the ACMS facility definition is registered in the DECtrace administration database. When ACMS is subsequently installed, the ACMS facility definition is registered and you can create a selection and schedule a collection.

- If DECtrace is not already installed on the system at the time of ACMS installation, the ACMS facility definition is inserted in the library file SYS$LIBRARY:EPC$FACILITY.TLB. If you later install DECtrace, the DECtrace EPC$INSERT post-installation procedure inserts the ACMS facility definitions in the DECtrace administration database.

You can use the **SHOW DEFINITION** command to list the facilities installed on your system. The following example shows the facility definitions on the node TSTVAX:

```
$ COLLECT SHOW DEFINITION /FORMAT=NAMES_ONLY
25-APR-1991 15:58       Facility Definition Information                Page
 1
Names Only Report                                              DECtrace
 V1.0-0
  Facility:             Version:    Creation Date:      Class:
  --------------------  ----------  ------------------  ------------------
  ACMS                  V3.2-0       7-APR-91 17:23     ALL
                                                        PERFORMANCE
 (D)
  ATM_SAMPLE            V1.0        25-APR-91 14:17     ALL
 (D)
  MY_FACILITY           V2.0        12-APR-91 10:27     ALL
                                                        WORKLOAD
 (D)
  RDBVMS                V3.2-0      20-APR-91 15:21     ALL
                                                        PERFORMANCE
 (D)
                                                        WORKLOAD
```

15.4.2. Creating a Selection

DECtrace can collect data from either all the facilities registered with it, or just the ones you are interested in. To specify a subset of the available facilities, use the **CREATE SELECTION** command to create a **facility selection** which consists of:

- Selection name
- List of facilities for which to collect data
- Class of data to collect for each facility

The basic format for the **CREATE SELECTION** command is:

```
CREATE SELECTION selection_name /FACILITY=(facility_name[,. . . ])
```

The following example defines the selection MY_SELECTION to collect the default data for ACMS:

```
$ COLLECT CREATE SELECTION MY_SELECTION /FACILITY=ACMS
```

However, to define a more detailed selection, use the **/OPTIONS** qualifier. This qualifier takes a file name as an argument. The options file lists each facility and the collection class you want to use. Each facility is described on a separate line. If you specify **/OPTIONS** but do not include a file name, DECtrace prompts you for the options. The format of the facility description in the options file is:

```
FACILITY facility-name [/VERSION="version-code"] [/CLASS=class-name]
```

The name of the facility for which to collect data. A text string identifying the version of the facility. The string must be enclosed with quotation marks (" "). The class of data that you want collected for the facility.

The following example creates the facility selection SELECT_ALL to collect all of the possible data for ACMS and only the performance-related data from MY_FACILITY:

```
$ COLLECT CREATE SELECTION SELECT_ALL /OPTIONS
OPTION> FACILITY ACMS /CLASS=ALL
OPTION> FACILITY MY_FACILITY /CLASS=PERFORMANCE
OPTION> CTRL/Z
$
```

15.4.3. Collecting Cross Facility Items

To collect cross facility items, use the **CREATE SELECTION** command to:

1. Specify the facilities for which to collect data.
2. Specify the collection class that includes the cross facility items to be collected for each facility involved.

The following classes include the PROCEDURE_CALL event, which collects the CROSS_FAC_2 and CROSS_FAC_7 values:

- PERFORMANCE
- RESPONSE
- ALL

To collect the CROSS_FAC_2 or CROSS_FAC_7 values, specify any one of these classes in the DECtrace **CREATE SELECTION** command.

If you are using the CROSS_FAC_14 value in your application, this value is logged to DECtrace during any ACMS event and collected by DECtrace if any of the above classes are selected.

To collect ACMS and Rdb data, use commands similar to the following:

```
DECtrace> create selection <sel-name> /options
Option> facility acms  /class=performance
Option> facility  rdbvms  /class=performance
Option> Ctrl/Z

DECtrace> schedule collection <coll-name> <coll-file>   -
_DECtrace> /selection=<sel-name> /begin= <start-time>  -
_DECtrace> /end=<end-time>
```

15.4.4. Scheduling Data Collection

You must schedule data collection on your system before DECtrace can begin collecting information about ACMS. The scheduling criteria include:

- Output file for the collected data
- Start and end times (or alternately, the duration)
- Facility selection to use
- Scope of the collection (the entire cluster or just the local node)

Note that although you can schedule many data collections on a node, only one collection can be active on a node at any time. DECtrace does not allow you to schedule data collections that overlap or run simultaneously.

The following example schedules the collection MY_COLLECTION to begin at 11:00 and end at 12:00 on the current day. The collection uses the facility selection SELECT_ALL and runs on the local node. DECtrace stores the collected data in the file MY_DATA.DAT in your default device and directory:

```
$ COLLECT SCHEDULE COLLECTION MY_COLLECTION MY_DATA.DAT -
_$ /SELECTION=SELECT_ALL -
_$ /BEGINNING=11:00 /ENDING=12:00 -
_$ /NOCLUSTER /PROTECTION=(W:W)
%EPC-S-SCHED, Data collection MY_COLLECTION is scheduled
```

Alternatively, you can use the **/DURATION** qualifier in place of the **/ENDING** qualifier. You must specify the duration as a relative OpenVMS time. For example:

```
$ COLLECT SCHEDULE COLLECTION MY_COLLECTION MY_DATA.DAT -
_$ /SELECTION=MY_SELECTION -
_$ /BEGINNING=11:00 /DURATION="1:" -
_$ /NOCLUSTER /PROTECTION=(W:W)
%EPC-S-SCHED, Data collection MY_COLLECTION is scheduled
```

You can schedule data collection either locally or clusterwide by using the **/[NO]CLUSTER** qualifier. By default, the **SCHEDULE COLLECTION** command schedules data collection to occur on every node in the cluster. To schedule data collection on a subset of the cluster, you must log in to each node

that you want data collection to occur on and schedule local data collection on that node by specifying **/NOCLUSTER**. Note that on a standalone system the **/CLUSTER** qualifier is ignored.

15.4.5. Using Registration IDs

In addition to scheduling when to collect data, you can specify which OpenVMS processes you wish to collect data from during the collection interval.

You select the processes from which to collect data by specifying one or more **registration IDs** with the **SCHEDULE COLLECTION** command. The registration ID is a facility- or process-specific character string that is known to the process only at run time

On the application node, the registration ID is the name of an ACMS application. It identifies the Application Execution Controller and server processes that make up the application. This allows you to collect data for a specific ACMS application.

DECtrace also registers process-specific information when an image containing DECtrace service routine calls activates. The process-specific registration IDs include the EPID (extended process ID), the image name, the user name, and the process name. This allows you to collect data on a per-process, per-user, or per-image basis.

The following example schedules a collection to gather ACMS event data from user JONES running the PAYROLL application:

```
$ COLLECT SCHEDULE COLLECTION MY_COLLECTION MY_DATA.DAT -
_$ /SELECTION=ACMS_SEL -
_$ /BEGINNING=11:00 /DURATION="1:" -
_$ /NOCLUSTER /PROTECTION=(W:W)-
_$ /REGISTRATION_ID=(JONES,WORK1:[FINANCE]PAYROLL.EXE)
%EPC-S-SCHED, Data collection MY_COLLECTION is scheduled
```

On the submitter node, the registration ID is "ACMS_AGENT." The registration ID "ACMS_AGENT" can be used to record TDMS, Request Interface, or DECforms I/O performed by an agent process.

Use the DECtrace **SHOW REGISTER** command to display the processes and images available for data collection on your system.

15.5. Creating a Report Based on Collected Data

You can use DECtrace to produce reports based on the data collected from one or more DECtrace collections. The two steps in producing DECtrace reports are:

1. Format and merge the data files.
2. Generate the report.

15.5.1. Formatting and Merging Data Files

Before DECtrace can generate a report on the data collected for your collections, you must use the **FORMAT** command to format the data in the data files into an Rdb database. An RMS formatted file is also available for users who plan to create their own reports based on the data. See the DECtrace documentation for information. The following example formats the data in the file MY_DATA.DAT and stores the formatted data in an Rdb database named FORMATTED_DATA.RDB:

```
$ COLLECT FORMAT MY_DATA.DAT FORMATTED_DATA
```

You can also use the **FORMAT** command to combine the data files from two or more collections into one formatted database. However, these collections must have been scheduled using the same facility selection.

The two ways you can combine data files are: format several data files at once into the same Rdb database, or add a data file to an existing formatted database. The following example combines the data collected from several collections into a new formatted database named WEEK.RDB:

```
$ COLLECT FORMAT MONDAY.DAT,TUESDAY.DAT,WEDNESDAY.DAT  WEEK
```

The following example adds the contents of the data file THURSDAY.DAT to the existing formatted database WEEK.RDB:

```
$ COLLECT FORMAT /MERGE THURSDAY.DAT WEEK
```

See the description of the **FORMAT** command in the DECtrace documentation for a list of optimization parameters that you can use to speed up formatting operations.

15.5.2. Generating a Report

DECtrace can generate tabular reports based on the data in an Rdb formatted database. *Table 15.8, "DECtrace Reports"* lists the three different types of reports that you can produce.

Table 15.8. DECtrace Reports

Type	Description
DETAIL	Actual values of the items collected for each event
FREQUENCY	Event occurrence summary based on a selected time interval
SUMMARY (default)	Summary statistics about the collected data

In the simplest case, the **REPORT** command creates a Summary Report on all of the data in the formatted database and displays the report on your current SYS$OUTPUT device (typically your terminal). For example:

```
$ COLLECT REPORT FORMATTED_DATA.RDB
```

You can further refine the report with the **/FACILITY** qualifier. The following example generates a Summary Report only on ACMS data and writes the report to the file MY_REPORT.TXT:

```
$ COLLECT REPORT FORMATTED_DATA.RDB /FACILITY=ACMS -
_$ /OUTPUT=MY_REPORT.TXT
```

Example 15.1, "Summary Report for ACMS Event Data" shows a typical report, MY_REPORT.TXT, based on ACMS event data.

Example 15.1. Summary Report for ACMS Event Data

```
19-APR-1991 16:57                Summary Report                        Page
 1
Selection: ACMS_ONLY                                              DECtrace
 V1.0-0
Event:  EXCHANGE_STEP   In Facility:  ACMS           Version:  V3.2-0
           Elapsed
```

```
Minimum       2.17
Maximum    1489.29
Mean         17.90
Std Dev     109.82
95 Prct     233.16
Total      5334.71
Count          298
%EPC-I-RPQU_BAD_95, 95 Prct for events with counts under 1000 are less
 precise

19-APR-1991 16:57               Summary Report                        Page
 2
Selection: ACMS_ONLY                                          DECtrace
 V1.0-0
Event:  PROCEDURE_CALL  In Facility:  ACMS           Version:  V3.2-0
           Elapsed  BUFFERED IO    CPU TIME  CURREN    DIRECT IO
 PAGEFAULTS
                                             T PRIO
Minimum       0.16            0           5       4            4
 0
Maximum      15.64           27         229       5          238
 1124
Mean          0.32         0.11        7.89    4.79         6.44
 4.03
Std Dev       0.89         1.58       12.95    0.40        13.57
 65.31
95 Prct       2.08         3.21       33.29    5.58        33.04
 132.04
Total        97.06           35        2346    1424         1914
 1199
Count          297
           PAGEFAULT     Proc Idx      VIRTUAL    GLOBAL WS   PRIVATE WS
                 IOs                     SIZE
Minimum             0            1         8148          773         1271
Maximum            25            1         8148          797         1347
Mean             0.08         1.00      8148.00       796.71      1344.20
Std Dev          1.45         0.00         0.00         1.63        12.61
95 Prct          2.92         1.00      8148.00       799.92      1368.93
Total              25          297      2419956       236624       399228
Count             297
            WORKING
            SET SIZ
Minimum        2824
Maximum        3124
Mean         3113.89
Std Dev        54.20
95 Prct      3220.14
Total         924828
Count            297

%EPC-I-RPQU_BAD_95, 95 Prct for events with counts under 1000 are less
 precise

19-APR-1991 16:57               Summary Report                        Page
 3
Selection: ACMS_ONLY                                          DECtrace
 V1.0-0
Event:  PROCESSING      In Facility:  ACMS           Version:  V3.2-0
```

```
        _STEP
           Elapsed
Minimum       0.17
Maximum      15.74
Mean          0.33
Std Dev       0.90
95 Prct       2.11
Total       100.64
Count          297
%EPC-I-RPQU_BAD_95, 95 Prct for events with counts under 1000 are less
 precise
%EPC-I-NOEND, 1 Start Event Records had no matching End

19-APR-1991 16:57               Summary Report                        Page
 4
Selection: ACMS_ONLY                                              DECtrace
 V1.0-0
Event:  TASK            In Facility:  ACMS            Version:  V3.2-0
           Elapsed
Minimum    5436.31
Maximum    5436.31
Mean       5436.31
Std Dev       0.00
95 Prct    5436.31
Total      5436.31
Count            1

%EPC-I-RPQU_BAD_95, 95 Prct for events with counts under 1000 are less
 precise

19-APR-1990 16:57                   Index                             Page
 5
Selection: ACMS_ONLY                                              DECtrace
 V1.0-0
Report Index
Facility Name                Event Name                          Page
ACMS                         EXCHANGE_STEP                       1
ACMS                         PROCEDURE_CALL                      2
ACMS                         PROCESSING_STEP                     3
ACMS                         TASK                                4
```

Use the **/STATISTICS** qualifier to specify the statistics DECtrace uses in the Summary Report. This feature allows you to create customized reports that present information in the manner most suitable to your needs. The valid statistics are:

- ALL
- COUNT (default)
- MAXIMUM
- MEAN
- MINIMUM
- STANDARD_DEVIATION
- TOTAL

- 95_PERCENTILE

The following example generates a Summary Report based on the data collected for ACMS using the statistics MAXIMUM, MINIMUM, and MEAN:

```
$ COLLECT REPORT FORMATTED_DATA.RDB /FACILITY=ACMS -
_$ /TYPE=SUMMARY /STATISTICS=(MAXIMUM,MINIMUM,MEAN) -
_$ /OUTPUT=MY_SUMMARY.TXT
```

By default, DECtrace reports on the data collected for all the events contained in the formatted database. You can use the **/EVENTS** qualifier to restrict the report to specific events. The following example generates a report based on the data collected for a subset of the events in ACMS:

```
$ COLLECT REPORT FORMATTED_DATA /OUTPUT=MY_REPORT.TXT -
_$ /FACILITY=ACMS -
_$ /EVENTS=(TASK,TASK_WAIT,FORMS_REQUEST)
```

15.5.3. Generating a Report with Cross Facility Items

To generate a formatted report for cross facility items whose values are equal for related events, follow these steps:

1. Use the DECtrace **REPORT** command options to select the relevant report data.

2. Use the DECtrace join operation to associate the events with each other.

For example, if you join the CROSS_FAC_2 and CROSS_FAC_7 items of the ACMS PROCEDURE_CALL event with those of an Rdb database TRANSACTION event, DECtrace relates each transaction occurrence with the procedure call in which it occurred.

To display ACMS and Rdb summary information for a specific server and procedure, use a DECtrace command similar to the following:

```
DECtrace> REPORT  /OPTIONS  /STATISTICS=ALL  /TYPE=SUMMARY
Option> event  PROCEDURE_CALL  /facility=acms
Option> event  TRANSACTION  /facility=rdbvms
Option> restrict  item  server_name=<server>
Option> restrict  item  procedure_name=<procedure>
Option> join PROCEDURE_CALL.cross_fac_2=TRANSACTION.cross_fac_2
Option> join PROCEDURE_CALL.cross_fac_7=TRANSACTION.cross_fac_7
Option> Ctrl/Z
```

Example 15.2, "DECtrace Summary Report" contains a summary report, which illustrates the related ACMS PROCEDURE_CALL and Rdb TRANSACTION events.

Example 15.2. DECtrace Summary Report

```
> COLLECT REPORT /OPTIONS /STATISTICS=ALL /TYPE=SUMMARY
Option> join PROCEDURE_CALL.CROSS_FAC_2=TRANSACTION.CROSS_FAC_2
Option> event PROCEDURE_CALL /FACILITY=ACMS
Option> event TRANSACTION /FACILITY=RDBVMS
11-May-1993 10:00           Summary Report              Page 1
Selection: xxx_xxx                                      DECtrace V1.2-0
Event:  PROCEDURE_CALL  In Facility:  ACMS          Version: V3.3-0B
CROSS_FAC_2  : 1
        Elapsed  BUFFERED IO   CPU TIME    CURRENT  DIRECT IO  PAGEFAULTS
                                              PRIO
Minimum   0.30         0             6          7         6           1
```

```
Maximum   0.47         0             7          7         8           2
Mean      0.38      0.00          6.50       7.00      7.00        1.50
Std Dev   0.12      0.00          0.70       0.00      1.41        0.70
95 Prct   0.62      0.00          7.88       7.00      9.77        2.88
Total     0.77         0            13         14        14           3
Count        2

          PAGEFAULT   Proc Idx   VIRTUAL   GLOBAL WS   PRIVATE WS
          IOs                    SIZE
Minimum      0             1         9676        755      1407
Maximum      2             1         9676        776      1407
Mean      1.00          1.00      9679.00      775.5   1407.00
Std Dev   1.41          0.00         0.00       0.70      0.00
95 Prct   3.77          1.00      9679.00     776.88   1407.00
Total        2             2        19358       1551      2814
Count2

          WORKING     CROSS_FAC_2
          SET SIZE
Minimum      4096           1
Maximum      4096           1
Mean      4096.00        1.00
Std Dev      0.00        0.00
95 Prct   4096.00        1.00
Total        8192           2
Count           2

11-May-1993 10:00           Summary Report            Page 1
Selection: xxx_xxx                                    DECtrace V1.2-0
Event:  TRANSACTION    In Facility:  RDBVMS       Version: T3.1-2
          Elapsed    AIJ File      BUFFERED  Buffer    Client PC
                       Writes      IO        Pool Rds
Minimum   0.10          0             0          0         3EC8
Maximum   0.16          0             0          2         3EC8
Mean      0.12       0.00          0.00       1.00      3EC8.00
Std Dev   0.04       0.00          0.00       1.41         0.00
95 Prct   0.21       0.00          0.00       3.77      3EC8.00
Total     0.25          0             0          2         7D90
Count        2

          WORKING   Trans Seq   CROSS_FAC_2
          SET SIZ   Num
Minimum      4096       45          1
Maximum      4096       45          1
Mean      4096.00    45.00       1.00
Std Dev      0.00     0.00       0.00
95 Prct   4096.00    45.00       1.00
Total     8192       90          2
Count           2
```

15.5.4. Creating a Customized Report

You can create customized reports that provide information on specific events and items. The **/OPTIONS** qualifier to the **REPORT** command allows you to specify characteristics for individual events and items. *Example 15.3, "Using Reporting Options to Generate a Customized Report"* shows the command to generate a report which uses a different report format for each event.

Example 15.3. Using Reporting Options to Generate a Customized Report

```
$ COLLECT REPORT MY_DATABASE -
```

```
        /SINCE = "01-JAN-1991" -
        /WIDTH = 80 -
        /TYPE = SUMMARY -
        /LENGTH = 66 -
        /OUTPUT = ACMS.REPORT -
        /STATISTICS = ALL -
        /TITLE = "ACMS Reports" -
        /OPTIONS
EVENT EXCHANGE_STEP -
        /FACILITY = ACMS -
        /TYPE = FREQUENCY -
        /INTERVAL = SECONDS -
        /SUBTITLE = "ACMS Exchange Step Frequency Report"
EVENT PROCEDURE_CALL -
        /FACILITY = ACMS -
        /GROUP_BY = (PROCEDURE_INDEX) -
        /STATISTICS = (MINIMUM, MAXIMUM, MEAN, STANDARD_DEVIATION) -
        /SUBTITLE = "ACMS Procedure Call Summary Report"
EVENT PROCEDURE_CALL -
        /FACILITY = ACMS -
        /GROUP_BY = (PROCEDURE_INDEX) -
        /TYPE = DETAIL -
        /SUBTITLE = "ACMS Procedure Call Detail Report"
ITEM PROCEDURE_INDEX /WIDTH = 9
ITEM PROCEDURE_INDEX /REPORT_HEADER = "Procedure Index"
RESTRICTION COLLECTION ACMS_COLL RESTRICTION EPID 2A8002DF,2A8002C1
RESTRICTION IMAGE PAYROLL, INVENTORY
RESTRICTION NODE ACMS1, ACMS2
```

Data from the MY_DATABASE formatted database is used for this report. The initial report command modifies several of the default qualifier values, such as the length of each report page and the date before which all data should be ignored. The **/OPTIONS** qualifier allows you to specify event and item qualifiers to either override the main qualifiers or provide additional restrictions to the report.

Based on the first part of the **REPORT** command, all subreports, unless otherwise specified, contain data from the data collection file with a timestamp date greater than or equal to January 1, 1991. The report is 80 columns wide and 66 lines long. The subreports are Summary Reports with all possible statistics displayed. The report is written to a file called ACMS.REPORT in your current directory.

The first subreport is based on the EXCHANGE_STEP event. The facility, a required qualifier, is ACMS. The type qualifier is overridden to generate a Frequency Report with a count displayed for each second during which at least one event occurrence was recorded. A subtitle, "ACMS Exchange Step Frequency Report," is displayed on the first page of the subreport. The following example shows the REPORT options required for the first subreport:

```
EVENT EXCHANGE_STEP -
        /FACILITY = ACMS -
        /TYPE = FREQUENCY -
        /INTERVAL = SECONDS -
        /SUBTITLE = "ACMS Exchange Step Frequency Report"
```

The second subreport is a Summary Report based on the PROCEDURE_CALL event. Again, the facility name (ACMS) is a required qualifier. The statistics are divided into groups based on equivalent values of the PROCEDURE_INDEX item. The statistics type has been overridden from a default of ALL to include only MINIMUM, MAXIMUM, MEAN, and STANDARD DEVIATION. A subtitle is given to help distinguish the subreport from other sections of the main report. The following example shows the REPORT options required for the second subreport:

```
EVENT PROCEDURE_CALL -
        /FACILITY = ACMS -
        /GROUP_BY = (PROCEDURE_INDEX) -
        /STATISTICS = (MINIMUM, MAXIMUM, MEAN, STANDARD_DEVIATION) -
        /SUBTITLE = "ACMS Procedure Call Summary Report"
```

The third subreport is a Detail Report based on the PROCEDURE_CALL event. The report is ordered by the PROCEDURE_INDEX item in ascending order. The item width is modified to use 9 columns. The report header is changed to "Procedure Index." In the report, "Start" is added to the beginning of the item header by DECtrace to signify that the value is based on the start event. DECtrace uses end event values for duration events if the item was collected on the end event. In this case, the PROCEDURE_INDEX item is only collected on the start event. If this had been a point event, the item header would not have been changed.

The RESTRICTION option allows you to create a very specific report. In this case, only data from nodes ACMS1 and ACMS2, for collection ACMS_COLL, from processes 2A8002DF and 2A8002C1, and from images PAYROLL and INVENTORY is displayed. The following example shows the REPORT options required to generate the third subreport:

```
EVENT PROCEDURE_CALL -
        /FACILITY = ACMS -
        /GROUP_BY = (PROCEDURE_INDEX) -
        /TYPE = DETAIL -
        /SUBTITLE = "ACMS Exchange Step Detail Report"
ITEM PROCEDURE_INDEX /WIDTH = 9
ITEM PROCEDURE_INDEX /REPORT_HEADER = "Procedure Index"
RESTRICTION EPID 2A8002DF,2A8002C1
RESTRICTION IMAGE PAYROLL, INVENTORY RESTRICTION NODE ACMS1, ACMS2
```

If many samples of data were generated, and you have interactive SQL or interactive RDO on your system, you can speed up report generation by adding an index to the PROCEDURE_CALL relation. The SQL syntax to do this is:

```
SQL> CREATE INDEX MY_CLIENT_PC_INDEX ON
SQL> EPC$1_253_PROCEDURE_CALL(IMAGE_RECORD_ID,
SQL> COLLECTION_RECORD_ID, PROCEDURE_INDEX_START);
```

If you have interactive RDO, the syntax is:

```
RDO> DEFINE INDEX MY_INDEX FOR EPC$1_253_PROCEDURE_CALL
RDO> TYPE IS SORTED.
RDO> IMAGE_RECORD_ID ASCENDING.
RDO> COLLECTION_RECORD_ID ASCENDING.
RDO> PROCEDURE_INDEX ASCENDING.
RDO> END MY_INDEX INDEX.
RDO> COMMIT;
```

Note that adding an index causes a delay in merging another data collection file into this formatted database, and the index does not help if you want to use GROUP_BY with a different set of items. You can drop the index before merging the databases by entering either of the following sets of commands:

```
SQL> DROP INDEX MY_INDEX;
SQL> COMMIT;
```

or

```
RDO> DELETE INDEX MY_INDEX;
RDO> COMMIT;
```

See the DECtrace documentation for a layout of the formatted database.

Example 15.4, "Sample DECtrace Customized Report Based on ACMS Data" shows the report generated by the commands described in *Example 15.3, "Using Reporting Options to Generate a Customized Report"*. The final page of the report contains an index for the report.

Example 15.4. Sample DECtrace Customized Report Based on ACMS Data

```
12-APR-1991 08:13             ACMS Reports                              Page
 1
Selection: DEBIT_CREDIT_SEL                                      DECtrace
 V1.0-0
Event:  EXCHANGE_STEP   In Facility:  ACMS            Version:  V3.2-0
                        ACMS Exchange Step Frequency Report
Time Period          Occurrences
17-SEP-1990 15:30:33           1
17-SEP-1990 15:30:45           1
17-SEP-1990 15:30:48           1

12-APR-1991 08:13             ACMS Reports                              Page
 2
Selection: DEBIT_CREDIT_SEL                                      DECtrace
 V1.0-0
Event:  PROCEDURE_CALL  In Facility:  ACMS            Version:  V3.-0
                        ACMS Procedure Call Summary Report
Proc Idx : 1
           Elapsed  BUFFERED IO    CPU TIME  CURREN    DIRECT IO
 PAGEFAULTS
                                             T PRIO
Minimum       0.30            0           6       7            6
 1
Maximum       0.47            0           7       7            8
 2
Mean          0.25         0.00        4.33    4.66         4.66
 1.00
Std Dev       0.23         0.00        3.78    4.04         4.16
 1.00
           PAGEFAULT     Proc Idx      VIRTUAL    GLOBAL WS   PRIVATE WS
                 IOs                     SIZE
Minimum             0            1         9679          775         1407
Maximum             2            1         9679          776         1407
Mean             0.66         0.66      6452.66       517.00       938.00
Std Dev          1.15         0.57      5588.17       447.73       812.33
             WORKING
             SET SIZ
Minimum         4096
Maximum         4096
Mean         2730.66
Std Dev      2364.82

               ================= Grand Total ====================
           Elapsed  BUFFERED IO    CPU TIME  CURREN    DIRECT IO
 PAGEFAULTS
                                             T PRIO
Minimum       0.30            0           6       7            6
 1
Maximum       0.47            0           7       7            8
 2
```

```
Mean          0.25         0.00        4.33    4.66         4.66
 1.00
Std Dev       0.23         0.00        3.78    4.04         4.16
 1.00
           PAGEFAULT     Proc Idx      VIRTUAL    GLOBAL WS   PRIVATE WS
                 IOs                     SIZE
Minimum             0            1         9679          775         1407
Maximum             2            1         9679          776         1407
Mean             0.66         0.66      6452.66       517.00       938.00
Std Dev          1.15         0.57      5588.17       447.73       812.33

12-APR-1990 08:13             ACMS Reports                            Page
 3
Selection: DEBIT_CREDIT_SEL                                    DECtrace
 V1.0-0
             WORKING
             SET SIZ
Minimum         4096
Maximum         4096
Mean         2730.66
Std Dev      2364.82

12-APR-1991 08:13             ACMS Reports                            Page
 4
Selection: DEBIT_CREDIT_SEL                                    DECtrace
 V1.0-0
Event:  PROCEDURE_CALL  In Facility:  ACMS           Version:  V3.2-0
  For Collections:  ACMS_COLL
  For Nodes:  ACMS1, ACMS2
  For Images:  PAYROLL, INVENTORY
  For EPIDs:  2A8002DF, 2A8002C1
                        ACMS Procedure Call Detail Report
Timestamp                  Elapsed
17-SEP-1990 15:30:33.24       0.47
17-SEP-1990 15:30:33.71
Start Appl Spec
DBCR_ALL_APP

BUFFERED IO     CPU TIME  CURREN    DIRECT IO   PAGEFAULTS    PAGEFAULT
                          T PRIO                                   IOs
         59          340       8          231         1778          84
         59          347       7          239         1780          86
      Start
  Procedure
      Index
          1

Start Server Name
DBCR_ALL_SERVER_01

Start Step Name
DBCR_PROCESSING

Start Sub Name
SYSTEM

Start Task Name
DBCR_ALL_TSK_DBCR
```

```
    VIRTUAL    GLOBAL WS   PRIVATE WS      WORKING
       SIZE                               SET SIZ
       9679          769         1405         4096
       9679          775         1407         4096

12-APR-1990 08:13             ACMS Reports                              Page
 5
Selection: DEBIT_CREDIT_SEL                                     DECtrace
 V1.0-0
Timestamp                   Elapsed
17-SEP-1990 15:30:45.71       0.30
17-SEP-1990 15:30:46.01
Start Appl Spec
DBCR_ALL_APP

BUFFERED IO     CPU TIME  CURREN    DIRECT IO   PAGEFAULTS    PAGEFAULT
                          T PRIO                                   IOs
         59          347       8          239         1780          86
         59          353       7          245         1781          86
    Start
Procedure
    Index          1

Start Server Name
DBCR_ALL_SERVER_01

Start Step Name
DBCR_PROCESSING

Start Sub Name
SYSTEM

Start Task Name
DBCR_ALL_TSK_DBCR

    VIRTUAL    GLOBAL WS   PRIVATE WS      WORKING
       SIZE                               SET SIZ
       9679          775         1407         4096
       9679          776         1407         4096

12-APR-1990 08:13                   Index                               Page
 6
Selection: DEBIT_CREDIT_SEL                                     DECtrace
 V1.0-0
Report Index
Facility Name               Event Name                       Page
ACMS                        EXCHANGE_STEP                    1
ACMS                        PROCEDURE_CALL                   2
ACMS                        PROCEDURE_CALL                   4
```

15.6. ACMS Database Relations

This section describes the event-data relations in the formatted database for the ACMS ALL collection class. This information is provided so that you can write customized reports based on data in the formatted database.

Table 15.9, "Columns for Table EPC$1_253_APL_RESPONSE" shows the APL_RESPONSE relation.

Table 15.9. Columns for Table EPC$1_253_APL_RESPONSE

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
TASK_NAME_START	VARCHAR (31)	
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
APL_USERNAME_START	VARCHAR (12)	
APL_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
EXCH_STEP_NAME_START	VARCHAR (31)	
EXCH_STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.10, "Columns for Table EPC$1_253_APL_RESPONSE_ST" shows the APL_RESPONSE_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.10. Columns for Table EPC$1_253_APL_RESPONSE_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.11, "Columns for Table EPC$1_253_COMPRESSED_MSG" shows the COMPRESSED_MSG relation.

Table 15.11. Columns for Table EPC$1_253_COMPRESSED_MSG

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_POINT	DATE VMS	
ORIGINAL_SIZE	INTEGER	
COMPRESSED_SIZE	INTEGER	
COMPRESSN_RATIO	INTEGER	
MESSAGE_SRC	VARCHAR(15)	
MESSAGE_SRC_STR_ID	INTEGER	STR_ID_DOMAIN
MESSAGE_DEST	VARCHAR(15)	
MESSAGE_DEST_STR_ID	INTEGER	STR_ID_DOMAIN

Table 15.12, "Columns for Table EPC$1_253_COMPRESSED_MSG_ST" shows the COMPRESSED_MSG_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.12. Columns for Table EPC$1_253_COMPRESSED_MSG_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.13, "Columns for Table EPC$1_253_EXCHANGE_STEP" shows the EXCHANGE_STEP relation.

Table 15.13. Columns for Table EPC$1_253_EXCHANGE_STEP

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
TASK_NAME_START	VARCHAR (31)	

Column Name	Data Type	Domain
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
APL_USERNAME_START	VARCHAR (12)	
APL_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
STEP_NAME_START	VARCHAR (31)	
STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
REQ_FORM_NAME_START	VARCHAR (31)	
REQ_FORM_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
DEVICE_NAME_START	VARCHAR (8)	
DEVICE_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SEND_ID_START	VARCHAR (31)	
SEND_ID_START_STR_ID	INTEGER	STR_ID_DOMAIN
RECEIVE_ID_START	VARCHAR (31)	
RECEIVE_ID_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.14, "Columns for Table EPC$1_253_EXCHANGE_STEP_ST" shows the EXCHANGE_STEP_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.14. Columns for Table EPC$1_253_EXCHANGE_STEP_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.15, "Columns for Table EPC$1_253_FORMS_ENABLE" shows the FORMS_ENABLE relation.

Table 15.15. Columns for Table EPC$1_253_FORMS_ENABLE

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
APPL_NODE_START	VARCHAR (15)	
APPL_NODE_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
DEVICE_NAME_START	VARCHAR (8)	
DEVICE_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
REQ_FORM_NAME_START	VARCHAR (31)	
REQ_FORM_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.16, "Columns for Table EPC$1_253_FORMS_ENABLE_ST" shows the FORMS_ENABLE_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.16. Columns for Table EPC$1_253_FORMS_ENABLE_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.17, "Columns for Table EPC$1_253_FORMS_REQUEST" shows the FORMS_REQUEST relation.

Table 15.17. Columns for Table EPC$1_253_FORMS_REQUEST

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
APPL_NODE_START	VARCHAR (15)	
APPL_NODE_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
DEVICE_NAME_START	VARCHAR (8)	
DEVICE_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
TASK_NAME_START	VARCHAR (31)	
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
EXCH_STEP_NAME_START	VARCHAR (31)	
EXCH_STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
REQ_FORM_NAME_START	VARCHAR (31)	
REQ_FORM_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SEND_ID_START	VARCHAR (31)	
SEND_ID_START_STR_ID	INTEGER	STR_ID_DOMAIN
RECEIVE_ID_START	VARCHAR (31)	
RECEIVE_ID_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.18, "Columns for Table EPC$1_253_FORMS_REQUEST_ST" shows the FORMS_REQUEST_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.18. Columns for Table EPC$1_253_FORMS_REQUEST_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.19, "Columns for Table EPC$1_253_PROCEDURE_CALL" shows the PROCEDURE_CALL relation.

Table 15.19. Columns for Table EPC$1_253_PROCEDURE_CALL

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
TASK_NAME_START	VARCHAR (31)	
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
APL_USERNAME_START	VARCHAR (12)	
APL_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
STEP_NAME_START	VARCHAR (31)	
STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
EXCH_STEP_NAME_START	VARCHAR (31)	
EXCH_STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
TXN_ID_START	VARCHAR (36)	
TXN_ID_START_STR_ID	INTEGER	STR_ID_DOMAIN

Column Name	Data Type	Domain
SERVER_NAME_START	VARCHAR (31)	
SERVER_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
PROCEDURE_NAME_START	VARCHAR (31)	
PROCEDURE_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SERVER_INDEX_START	INTEGER	
PROCEDURE_INDEX_START	INTEGER	
BIO_START	INTEGER	
DIO_START	INTEGER	
PAGEFAULTS_START	INTEGER	
PAGEFAULT_IO_START	INTEGER	
CPU_START	INTEGER	
CURRENT_PRIO_START	SMALLINT	
VIRTUAL_SIZE_START	INTEGER	
WS_SIZE_START	INTEGER	
WS_PRIVATE_START	INTEGER	
WS_GLOBAL_START	INTEGER	
CROSS_FAC_2_START	INTEGER	
CROSS_FAC_7_START	INTEGER	
CROSS_FAC_14_START	INTEGER	
BIO_END	INTEGER	
DIO_END	INTEGER	
PAGEFAULTS_END	INTEGER	
PAGEFAULT_IO_END	INTEGER	
CPU_END	INTEGER	
CURRENT_PRIO_END	SMALLINT	
VIRTUAL_SIZE_END	INTEGER	
WS_SIZE_END	INTEGER	
WS_PRIVATE_END	INTEGER	
WS_GLOBAL_END	INTEGER	
CROSS_FAC_2_END	INTEGER	
CROSS_FAC_7_END	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.20, "Columns for Table EPC$1_253_PROCEDURE_CALL_ST" shows the PROCEDURE_CALL_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.20. Columns for Table EPC$1_253_PROCEDURE_CALL_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.21, "Columns for Table EPC$1_253_PROCESSING_STEP" shows the PROCESSING_STEP relation.

Table 15.21. Columns for Table EPC$1_253_PROCESSING_STEP

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
TASK_NAME_START	VARCHAR (31)	
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
APL_USERNAME_START	VARCHAR (12)	
APL_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
STEP_NAME_START	VARCHAR (31)	
STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
EXCH_STEP_NAME_START	VARCHAR (31)	
EXCH_STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
TXN_ID_START	VARCHAR (36)	

Column Name	Data Type	Domain
TXN_ID_START_STR_ID	INTEGER	STR_ID_DOMAIN
PROC_STEP_TYPE_START	VARCHAR (20)	
PROC_STEP_TYPE_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.22, "Columns for Table EPC$1_253_PROCESSING_STEP_ST" shows the PROCESSING_STEP_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.22. Columns for Table EPC$1_253_PROCESSING_STEP_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.23, "Columns for Table EPC$1_253_REMOTE_REQUEST" shows the REMOTE_REQUEST relation.

Table 15.23. Columns for Table EPC$1_253_REMOTE_REQUEST

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
APPL_NODE_START	VARCHAR (15)	
APPL_NODE_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
DEVICE_NAME_START	VARCHAR (8)	
DEVICE_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN

Column Name	Data Type	Domain
TASK_NAME_START	VARCHAR (31)	
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
EXCH_STEP_NAME_START	VARCHAR (31)	
EXCH_STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
REQ_FORM_NAME_START	VARCHAR (31)	
REQ_FORM_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.24, "Columns for Table EPC$1_253_REMOTE_REQUEST_ST" shows the REMOTE_REQUEST_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.24. Columns for Table EPC$1_253_REMOTE_REQUEST_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.25, "Columns for Table EPC$1_253_SUB_RESPONSE" shows the SUB_RESPONSE relation.

Table 15.25. Columns for Table EPC$1_253_SUB_RESPONSE

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
APPL_NODE_START	VARCHAR (15)	
APPL_NODE_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	

Column Name	Data Type	Domain
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
DEVICE_NAME_START	VARCHAR (8)	
DEVICE_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
TASK_NAME_START	VARCHAR (31)	
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
EXCH_STEP_NAME_START	VARCHAR (31)	
EXCH_STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
NETWORK_TIME_END	INTEGER	
PROCESSING_TIME_END	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.26, "Columns for Table EPC$1_253_SUB_RESPONSE_ST" shows the SUB_RESPONSE_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.26. Columns for Table EPC$1_253_SUB_RESPONSE_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.27, "Columns for Table EPC$1_253_TASK" shows the TASK relation.

Table 15.27. Columns for Table EPC$1_253_TASK

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
TASK_NAME_START	VARCHAR (31)	

Column Name	Data Type	Domain
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
APL_USERNAME_START	VARCHAR (12)	
APL_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
STEP_NAME_START	VARCHAR (31)	
STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
PARENT_TASK_START	VARCHAR (31)	
PARENT_TASK_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.28, "Columns for Table EPC$1_253_TASK_ST" shows the TASK_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.28. Columns for Table EPC$1_253_TASK_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.29, "Columns for Table EPC$1_253_TASK_WAIT" shows the TASK_WAIT relation.

Table 15.29. Columns for Table EPC$1_253_TASK_WAIT

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN

Column Name	Data Type	Domain
TASK_NAME_START	VARCHAR (31)	
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
APL_USERNAME_START	VARCHAR (12)	
APL_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
STEP_NAME_START	VARCHAR (31)	
STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
EXCH_STEP_NAME_START	VARCHAR (31)	
EXCH_STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
TXN_ID_START	VARCHAR (36)	
TXN_ID_START_STR_ID	INTEGER	STR_ID_DOMAIN
SERVER_NAME_START	VARCHAR (31)	
SERVER_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
PROCEDURE_NAME_START	VARCHAR (31)	
PROCEDURE_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
CROSS_FAC_14_END	INTEGER	

Table 15.30, "Columns for Table EPC$1_253_TASK_WAIT_ST" shows the TASK_WAIT_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.30. Columns for Table EPC$1_253_TASK_WAIT_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Table 15.31, "Columns for Table EPC$1_253_TRANSACTION" shows the TRANSACTION relation.

Table 15.31. Columns for Table EPC$1_253_TRANSACTION

Column Name	Data Type	Domain
COLLECTION_RECORD_ID	SMALLINT	COLLECTION_RECORD_ID_DOMAIN
IMAGE_RECORD_ID	INTEGER	IMAGE_RECORD_ID_DOMAIN
CONTEXT_NUMBER	INTEGER	CONTEXT_NUMBER_DOMAIN
TIMESTAMP_START	DATE VMS	
TIMESTAMP_END	DATE VMS	
APPL_SPEC_START	VARCHAR (39)	
APPL_SPEC_START_STR_ID	INTEGER	STR_ID_DOMAIN
TASK_NAME_START	VARCHAR (31)	
TASK_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
APL_USERNAME_START	VARCHAR (12)	
APL_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
SUB_USERNAME_START	VARCHAR (12)	
SUB_USERNAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
STEP_NAME_START	VARCHAR (31)	
STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
EXCH_STEP_NAME_START	VARCHAR (31)	
EXCH_STEP_NAME_START_STR_ID	INTEGER	STR_ID_DOMAIN
TXN_ID_START	VARCHAR (36)	
TXN_ID_START_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_START	INTEGER	
TXN_STATUS_END	VARCHAR (31)	
TXN_STATUS_END_STR_ID	INTEGER	STR_ID_DOMAIN
CROSS_FAC_14_END	INTEGER	

Table 15.32, "Columns for Table EPC$1_253_TRANSACTION_ST" shows the TRANSACTION_ST relation. An index is provided for this relation. It is defined with column STR_ID, duplicates are allowed, and the type is sorted.

Table 15.32. Columns for Table EPC$1_253_TRANSACTION_ST

Column Name	Data Type	Domain
STR_ID	INTEGER	STR_ID_DOMAIN
SEGMENT_NUMBER	SMALLINT	SEGMENT_NUMBER_DOMAIN
STR_SEGMENT	VARCHAR(0)	

Chapter 16. Managing ACMS Licensing

Concurrent-use licensing increases the number of licensing options available for ACMS run-time and remote-access systems. You can choose the more cost-effective licensing method for your ACMS system: concurrent-use or unlimited-use.

Concurrent-use licensing allows you to control access to ACMS run-time and remote-access systems, based on a predetermined number of users that can access ACMS at any one time. Concurrent-use licenses apply to both single node systems and to clusters.

For more information about licenses and kit options, see *VSI ACMS Version 5.0 for OpenVMS Installation Guide* [https://docs.vmssoftware.com/vsi-acms-installation-guide/].

16.1. Overview of ACMS Kits and Licensing Options

This section provides an overview of the ACMS kits and the functions provided by each kit, describes concurrent-use and unlimited-use licenses, and lists the license types that are available for each kit.

16.1.1. ACMS Kits

ACMS kits determine what functions ACMS users are able to perform. The three types of ACMS kits are:

- ACMS Development Kit

  This kit provides all the features of ACMS. You can define, build, and debug multiple-step tasks, task groups, menus, and applications, as well as use the ACMS task queuing facilities. You can use DECforms or TDMS as standard presentation services, or use the Request Interface (RI) and Systems Interface (SI) to access other presentation services. You are provided with samples of ACMS applications using standard presentation services and the Request Interface.

  The development kit also includes the features provided by the Run-Time and Remote-Access kits.

- ACMS Run-Time Kit

  This kit allows you to use existing applications or programs under the control of ACMS. It also allows you to define menus, applications, task groups, and single-step tasks that use DCL servers, if CDD is present when this kit is installed. It allows ACMS users to sign in and select tasks that are implemented on the local node as well as remote nodes. The run-time kit allows you to use the ACMS Queued Task Initiator (QTI) to submit tasks to run on the local node as well as remote nodes.

  The run-time kit also includes the features provided by the remote-access kit.

- ACMS Remote-Access Kit

  This kit is suitable for installation on a network node that does not have any ACMS applications running on it, but requires access to ACMS applications running on another network node. The remote-access kit allows users to sign in to ACMS and select tasks on remote nodes, and handles the

terminal I/O associated with those tasks. The remote-access kit allows you to use the ACMS Queued Task Initiator (QTI) to submit tasks to run on remote nodes.

16.1.2. ACMS License Types

ACMS offers two types of licenses:

- Unlimited-use license

  This type of license is also referred to as a **capacity license**. Unlimited-use licenses set no limit on the number of users who can access ACMS at any one time.

- Concurrent-use license

  Concurrent-use licenses limit the number of users who can access ACMS at any one time. For example, a concurrent-use license for four users gives a maximum of four users access to ACMS simultaneously.

Unlimited-use licenses are available for all ACMS kits. Concurrent-use licenses are available only for the ACMS run-time and remote-access kits; there is no concurrent-use license available for the ACMS development kit.

Table 16.1, "ACMS Licenses" summarizes all of the ACMS kits and available licenses.

Table 16.1. ACMS Licenses

ACMS Kit	Unlimited-Use	Concurrent-Use
Development	ACMS	Not available
Run-time	ACMS-RT	ACMS-RT-USER
Remote-access	ACMS-REM	ACMS-REM-USER

Concurrent-use licenses are expressed in terms of **units**. 100 license units are required for each concurrent user; for example, a concurrent-use license of 500 units allows five users to access ACMS concurrently. Each group of 100 units is referred to as a **set** of license units.

Concurrent-use licenses of the same kit type, for instance, either the run-time kit or remote-access kit, are cumulative. If you have more than one concurrent-use license, add together the number of units on each license to determine the total number of users that can access ACMS.

Only one license type is in effect on an ACMS system at any one time. If you have more than one ACMS license loaded, ACMS chooses, at startup, the license with the least restrictive functionality.

The following list shows all license types, from least to most restrictive functionality:

- ACMS (least restrictive)
- ACMS–RT
- ACMS–RT–USER
- ACMS–REM
- ACMS–REM–USER (most restrictive)

For more information on license management, refer to *VSI ACMS Version 5.0 for OpenVMS Installation Guide* [https://docs.vmssoftware.com/vsi-acms-installation-guide/] and the License Management Facility (LMF) documentation in the OpenVMS documentation set.

16.2. License Unit Allocation

License units are allocated to a user. The term **user** refers to an ACMS task submitter, which includes:

- Interactive users signed in to the ACMS Command Process (CP)
- Interactive users accessing ACMS using the ACMS Request Interface (RI) agent
- Interactive users accessing ACMS from ALL–IN–1
- Task submitters signed in to ACMS by the ACMS Queued Task Initiator (QTI)
- Task submitters signed in to ACMS by a user-written agent
- Task submitters signed in to ACMS by a detached task

The following rules apply to the allocation of license units at run time.

- ACMS allocates a set of license units to a user on each node on which the user is active.

  For example, when a user signs in to ACMS on Node A, a set of license units is allocated to the user on Node A. If a user signs in to Node A and selects a task on Node B, a set of license units is allocated on both Node A (for the sign-in) and Node B (for the task selection).

  If a user signs in to ACMS on Node A and Node B, a set of license units is allocated on each node.

- A set of license units is allocated each time the user signs in.

  For example, if a user signs in twice on Node A, two sets of license units are allocated on Node A.

- Once a user is signed in to a node, the user can select ACMS tasks on that node without using additional license units.

  For example, if a user on Node A selects a task in an application running on Node A, only one set of license units is allocated; no additional license units are required if the user selects an additional task in that application or a different application on Node A.

  Likewise, if the user on Node A selects tasks on Node B, license units are allocated only for the first task selected on Node B; no additional license units are allocated if the user selects additional tasks on Node B.

- License units allocated to a user remain allocated to that user until the user signs out of ACMS. At that time, all license units held by the user are released, including the license units allocated on the local node and any license units allocated to that user on remote nodes.

  For example, if a user on Node A signs in and selects tasks in applications on Nodes B and C, license units on Nodes A, B, and C are released when the user signs out from Node A.

- License units on a remote node allocated to a user who has selected a task in an application on that remote node are released, if the application is shut down, and the user has not selected tasks in another application on the remote node.

As a corollary to this rule, once a user on Node A selects a task in an application on Node B, that user continues to hold license units on Node B, even if the user selects no more tasks on Node B. In this situation, license units remain allocated to the user on Node B until the user signs out from Node A, the application on Node B runs down, or until the connection between Nodes A and B is broken.

- During initialization, ACMS temporarily allocates a license unit and then releases it.

  ACMS requires a valid loaded license to start the ACMS run-time system and the Application Definition Utility (ADU). With concurrent-use licenses, ACMS checks for the presence of a valid license by temporarily allocating a license unit. Once the set of license units is successfully allocated, the license units are immediately released and use of the system is granted.

The following sections describe rules for license unit allocation in special cases:

- In an OpenVMS Cluster network
- With the QTI
- With detached tasks

16.2.1. License Unit Allocation in OpenVMS Clusters

License units of a concurrent-use license for an OpenVMS Cluster are shared among all nodes in the cluster that have the license loaded. The rules for license unit allocation are the same whether a node is in a cluster or not. The only difference is that nodes of a cluster share the same pool of license units.

When a user is signed in on Node A of a cluster, a set of license units is allocated, even if the user is already signed in on Node B or C of the cluster. Therefore, it is possible for a user to hold a set of license units from the common license unit pool on every node of the cluster, if that user is signed in on every node.

For example, a cluster with a 50-user concurrent-use license has three nodes. A user on Node A is allocated one set of license units on Node A. If that user also selects tasks in applications on Node B and Node C, the user is allocated a set of license units on each of those nodes. The user's total license unit allocation corresponds to three user sign-ins. All license units are allocated out of the shared pool of license units corresponding to 50 users, leaving a total number of license units corresponding to 47 users.

16.2.2. Concurrent-Use Licenses with the QTI

The QTI is an ACMS System Interface (SI) agent program. As with all agent programs, the QTI uses the ACMS$SIGN_IN service to sign a submitter in before invoking a task on behalf of that submitter, thus allocating a set of license units.

When the QTI dequeues a queued task element, it checks the user name associated with the element. The first time the QTI dequeues an element with that user name, it signs the submitter in to ACMS but does not sign the submitter out of ACMS when that task ends. Instead, the QTI leaves the submitter signed in for at least the time specified in QTI_SUB_TIMEOUT. If another queued element with the same user name is dequeued prior to the time-out period, a submitter is already signed in for the user. This avoids the overhead of signing in and signing out the submitter.

If you have concurrent-use licenses for your ACMS system, a set of license units is allocated by the QTI for each submitter that the QTI signs in. The license units remain allocated until the QTI signs a submitter out.

Use the ACMSGEN parameter QTI_SUB_TIMEOUT to indicate how long a signed-in submitter can remain idle before the QTI signs the submitter out of ACMS.

16.2.3. Concurrent-Use Licenses with Detached Tasks

For every detached task started, the ACMS$SIGN_IN service signs in a task submitter. If you have concurrent-use licenses, a set of license units is allocated for each detached task that is started. These license units remain allocated until the task submitter signs out and the detached task stops.

See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for more information about concurrent-use licenses with detached tasks.

16.3. Managing Systems with Concurrent-Use Licenses

ACMS provides three operator commands that allow you to determine the identities and number of users accessing a system:

- **`ACMS/SHOW APPLICATION/CONNECTIONS`**

  This command displays all the local and remote users who are connected to local applications.

  A user is **connected to** an application when that user selects a task in the application for the first time. The connection remains until the user signs out of ACMS or the application is shut down.

- **`ACMS/SHOW SYSTEM`**

  This command displays information about both local and remote users.

- **`ACMS/SHOW USER`**

  This command displays the local and remote users accessing the ACMS system, and lists the local applications that users are connected to. It also displays the total number of users on the system. The total number of local and remote users corresponds to the total number of license units allocated.

Note

The scope of ACMS operator commands is limited to one node. Therefore, in VSI OpenVMS Cluster environments, you must execute the operator commands on each node of the cluster to obtain a total view of how license units are allocated in the cluster.

16.3.1. Releasing License Units

When a user is unable to sign in to an ACMS system, or unable to select a task on a remote node because the license units for the node have been exhausted, you may want to release license units to allow other higher-priority users access to the ACMS system.

There are two operator commands that allow you to release license units:

- **`ACMS/CANCEL USER`**
- **`ACMS/STOP APPLICATION`**

Before executing either of these commands, use the **ACMS/SHOW USER** command to identify local and remote users accessing the system.

To release license units, issue the **ACMS/CANCEL USER** command on the local node to cancel a local user. This forces the local user to sign out of the ACMS system. To cancel a remote user, use the **ACMS/CANCEL USER** command on the remote node on which the user was originally signed in. This releases all the allocated license units. This command requires OPER privileges.

In an extreme case, you can release license units allocated to a remote user on an ACMS system by shutting down all applications used by the remote user. The **ACMS/STOP APPLICATION** command shuts down an application. Stopping an application affects all users connected to that application.

Part II. Reference Section

This part of the manual contains reference information for each ACMS command. The following types of commands are described in this section:

- Device Definition Utility (DDU)
- User Definition Utility (UDU)
- Application Authorization Utility (AAU)
- Queue Manager (ACMSQUEMGR) Utility
- Operator
- ACMSGEN Utility
- Audit Trail Report (ATR) Utility
- Software Event Logger Utility Program (SWLUP)

The chapters in *Part I, "Managing the ACMS System and ACMS Applications"* provide tutorial discussions of these commands and utilities.

Chapter 17. DDU Commands

This chapter provides reference information and examples for each ACMS Device Definition Utility (DDU) command. See *Chapter 2, "Authorizing and Controlling Terminals"* for a general description of DDU.

ADD Command (DDU>)

ADD Command (DDU>) — Authorizes and assigns sign-in characteristics to an ACMS terminal by creating a DDU definition and adding it to the device authorization file (ACMSDDF.DAT).

Format

ADD *device-name*

Command Qualifiers	Defaults
/[NO]AUTOLOGIN=*username*	From DEFAULT definition
/[NO]CONTROLLED	From DEFAULT definition
/PRINTFILE [= *print-file-spec* *spooled-device-name*]	From DEFAULT definition

Privileges Required

None.

Parameters

device-name

The name of the device. The device name can be a logical name, a physical device name, or a group device name. Do not include a colon (:) when you specify a device name. See *Table 2.1, "DDU Group Device Names"* for a list of the DDU group device names.

Qualifiers

/[NO]AUTOLOGIN=*username*

The **/AUTOLOGIN** qualifier enables automatic sign-ins for ACMS-controlled terminals. With automatic sign-in enabled, the user does not need to enter a user name to sign in to ACMS. If a password is required, the user receives the password prompt after pressing **Return**. If a password is not required, the user is signed in to ACMS as soon as **Return** is pressed on the terminal's keyboard.

ACMS places the user name you specify with the **/AUTOLOGIN** qualifier in the device authorization file and uses that user name each time a user presses **Return**. The user name can contain 1 through 12 characters.

The **/AUTOLOGIN** qualifier has no effect unless the terminal has the Controlled sign-in characteristic. You can assign a Controlled sign-in characteristic by specifying the **/CONTROLLED** qualifier.

Disable automatic sign-ins with the **/NOAUTOLOGIN** qualifier. The default for this qualifier is whatever is defined in the **DEFAULT** definition. See the description of the DDU **DEFAULT** command for information on the **DEFAULT** definition.

/[NO]CONTROLLED

The **/CONTROLLED** qualifier assigns the Controlled sign-in characteristic to a device. Users at application port terminals with the Controlled sign-in characteristic sign in directly to ACMS. Users at dedicated service port terminals sign in either directly to ACMS or not, depending on the node they connect to at the "Local>" prompt. See *Section 2.11, "Authorizing LAT Terminal Ports as Controlled Terminals"* for a description of application ports and dedicated service ports.

The **/NOCONTROLLED** qualifier assigns the Not Controlled sign-in characteristic to a device. Users at terminals with the Not Controlled characteristic sign in directly to OpenVMS. For access to ACMS, you must enter the **ACMS/ENTER** command.

When you specify the **/CONTROLLED** qualifier, you can specify only a physical device name or the group device names TT and LT. See *Table 2.1, "DDU Group Device Names"* for a description of the DDU group device names. The default for this qualifier is whatever is defined in the **DEFAULT** definition. See the description of the DDU **DEFAULT** command for information on the **DEFAULT** definition.

Note

The ACMS Terminal Subsystem Controller (TSC) does not support dialup lines as ACMS-controlled terminals. Because the TSC keeps a channel to ACMS-controlled terminals even when the user signs out, the modem does not receive any hangup notification. If you operate a terminal using ACMS over dialup lines, you must first log in to OpenVMS, and then issue the **ACMS/ENTER/NORETURN** command. The **/NORETURN** qualifier deletes the OpenVMS process after you enter ACMS.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

The **/PRINTFILE** qualifier assigns the Printfile characteristic to a device. The print response must appear in the form source IFDL file, and a print key must also be defined there. When the user presses the print key, the DECforms panel screens are automatically sent to the print file or spooled device specified after the **/PRINTFILE** qualifier.

When you specify the **/PRINTFILE** qualifier, you can specify only a spooled device name or a file name. The default for this qualifier is whatever is defined in the DEFAULT definition.

Notes

DDU writes the definition you are creating to the device authorization file in your current default directory, or to the file pointed to by the EXECUTIVE mode system logical name, ACMSDDF.

New definitions go into effect after you use the **ACMS/RESET TERMINALS** command, the **ACMS/START SYSTEM** command, or the **ACMS/START TERMINALS** command.

For more information about the DDU database authorization file (ACMSDDF.DAT) and the DDU in general, see *Chapter 2, "Authorizing and Controlling Terminals"*.

Examples

1. `DDU>` **`ADD TTE6`**

This command creates a device definition for the terminal TTE6, using the sign-in characteristics defined in the DDU DEFAULT definition.

2. DDU> **ADD TTE6 /CONTROLLED/AUTOLOGIN=JUDGE**

   This command creates a device definition with the Controlled and Autologin sign-in characteristics for terminal TTE6. Users at terminal TTE6 sign in directly to ACMS without typing a user name. ACMS places the user name JUDGE in the device definition file and uses that user name whenever a user presses **Return** at terminal TTE6.

3. DDU> **ADD $ALL/NOCONTROLLED**

   This command adds a definition for the group device name $ALL, which authorizes all unauthorized terminals and assigns the terminals the Not Controlled sign-in characteristic.

4. DDU> **ADD LT /NOCONTROLLED**

   This command adds a definition for the group device name LT. The LT device name authorizes all unauthorized LAT terminals and assigns the terminals the Not Controlled sign-in characteristic.

COPY Command (DDU>)

COPY Command (DDU>) — Authorizes a terminal, using the sign-in characteristics from the DDU definition you specify.

Format

COPY *source-device-name new-device-name*

Command Qualifiers	Defaults
/[NO]AUTOLOGIN=*username*	From source definition
/[NO]CONTROLLED	From source definition
/PRINTFILE [= *print-file-spec* *spooled-device-name*]	From source definition

Privileges Required

None.

Parameters

source-device-name

The device name in the source definition. The source device name can be a logical name, a physical device name, or a group device name. Do not include a colon (:) when you specify a device name. See *Table 2.1, "DDU Group Device Names"* for a list of the DDU group device names.

new-device-name

The device name in the definition you are creating. The new device name cannot already exist in the device authorization file. See source-device-name for syntax rules.

Qualifiers

/[NO]AUTOLOGIN=*user-name*

The **/AUTOLOGIN** qualifier enables automatic sign-ins for ACMS-controlled terminals. With automatic sign-in enabled, the user does not need to enter a user name to sign in to ACMS. If a password is required, the user receives the password prompt after pressing **Return**. If a password is not required, the user is signed in to ACMS as soon as **Return** is pressed on the terminal's keyboard.

ACMS places the user name you specify with the **/AUTOLOGIN** qualifier in the device authorization file and uses that user name each time a user presses **Return** at that terminal. A user name can contain 1 through 12 characters.

The **/AUTOLOGIN** qualifier has no effect unless the terminal has the Controlled sign-in characteristic. Assign a Controlled sign-in characteristic by specifying the **/CONTROLLED** qualifier. Disable automatic sign-ins with the **/NOAUTOLOGIN** qualifier. The default for this qualifier is whatever is defined in the definition you are copying.

/[NO]CONTROLLED

The **/CONTROLLED** qualifier assigns the Controlled sign-in characteristic to a device. Users at application port terminals with the Controlled sign-in characteristic sign in directly to ACMS. Users at dedicated service port terminals sign in either directly to ACMS or not, depending on the node they connect to at the "Local>" prompt. See *Section 2.11, "Authorizing LAT Terminal Ports as Controlled Terminals"* for a description of application ports and dedicated service ports.

The **/NOCONTROLLED** qualifier assigns the Not Controlled sign-in characteristic to a device. Users at terminals with the Not Controlled characteristic log in directly to OpenVMS. For access to ACMS, you must enter the **ACMS/ENTER** command.

When you use the **/CONTROLLED** qualifier, you can specify only a physical device name or the group device names TT and LT. See *Table 2.1, "DDU Group Device Names"* for a description of the DDU group device names. The default for this qualifier is whatever is defined in the definition you are copying.

Note

The ACMS Terminal Subsystem Controller (TSC) does not support dialup lines as ACMS-controlled terminals. Because the TSC keeps a channel to ACMS-controlled terminals even when the user signs out, the modem does not receive any hangup notification. If you operate a terminal using ACMS over dialup lines, you must first log in to OpenVMS, and then issue the **ACMS/ENTER/NORETURN** command. The **/NORETURN** qualifier deletes the OpenVMS process after you enter ACMS.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

The **/PRINTFILE** qualifier assigns the Printfile characteristic to a device. The PRINT response must appear in the form source IFDL file, and a print key must also be defined there. When the user presses the print key, the DECforms panel screens automatically are sent to the print file or spooled device specified after the **/PRINTFILE** qualifier.

When you specify the **/PRINTFILE** qualifier, you can specify only a spooled device name or a file name. The default for this qualifier is The default for this qualifier is whatever is defined in the definition you are copying.

Notes

DDU writes the definition you are creating to the device authorization file in your current default directory, or to the file pointed to by the EXECUTIVE mode system logical name, ACMSDDF.

Changes to definitions go into effect after you use one of the following commands:

- **ACMS/RESET TERMINALS**
- **ACMS/START TERMINALS**
- **ACMS/START SYSTEM**

Example

```
DDU> COPY TTE1 TTE2
```

This command authorizes terminal TTE2 using the sign-in characteristics defined for terminal TTE1.

DEFAULT Command (DDU>)

DEFAULT Command (DDU>) — Changes information in the DDU DEFAULT definition.

Format

DEFAULT

Command Qualifiers	Defaults
/[NO]AUTOLOGIN=*username*	From current DEFAULT definition
/[NO]CONTROLLED	From current DEFAULT definition
/PRINTFILE [= *print-file-spec* / *spooled-device-name*]	From current DEFAULT definition

Privileges Required

None.

Qualifiers

/[NO]AUTOLOGIN=*user-name*

The **/AUTOLOGIN** qualifier enables automatic sign-ins for ACMS-controlled terminals. With automatic login enabled, the user does not need to enter a user name to sign in to ACMS. If a password is required, the user receives the password prompt after pressing **Return**. If a password is not required, the user is signed in to ACMS as soon as **Return** is pressed on the terminal's keyboard.

ACMS places the user name you specify with the **/AUTOLOGIN** qualifier in the device authorization file and uses that user name each time a user presses **Return** at that terminal. The user name can contain 1 through 12 characters.

The **/AUTOLOGIN** qualifier has no effect unless the terminal has the Controlled sign-in characteristic. Assign a Controlled sign-in characteristic by specifying the **/CONTROLLED** qualifier. Disable automatic sign-ins with the **/NOAUTOLOGIN** qualifier. The default is whatever sign-in characteristics are currently defined in the DDU DEFAULT definition.

/[NO]CONTROLLED

The **/CONTROLLED** qualifier assigns the Controlled sign-in characteristic to a device. Users at application port terminals with the Controlled sign-in characteristic sign in directly to ACMS. Users at dedicated service port terminals sign in either directly to ACMS or not, depending on the node they connect to at the "Local>" prompt. See *Section 2.11, "Authorizing LAT Terminal Ports as Controlled Terminals"* for a description of application ports and dedicated service ports.

The **/NOCONTROLLED** qualifier assigns the Not Controlled sign-in characteristic to a device. Users at terminals with the Not Controlled characteristic log in directly to OpenVMS. For access to ACMS, you must enter the **ACMS/ENTER** command.

When you specify the **/CONTROLLED** qualifier, you can specify only a physical device name or the group device names TT and LT. See *Table 2.1, "DDU Group Device Names"* for a description of the DDU group device names. The default is whatever sign-in characteristics are currently defined in the DDU DEFAULT definition.

Note

The ACMS Terminal Subsystem Controller (TSC) does not support dialup lines as ACMS-controlled terminals. Because the TSC keeps a channel to ACMS-controlled terminals even when the user signs out, the modem does not receive any hangup notification. If you operate a terminal using ACMS over dialup lines, you must first log in to OpenVMS, and then issue the **ACMS/ENTER/NORETURN** command. The **/NORETURN** qualifier deletes the OpenVMS process after you enter ACMS.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

The **/PRINTFILE** qualifier assigns the Printfile characteristic to a device. The PRINT response must appear in the form source IFDL file, and a print key must also be defined there. When the user presses the print key, the DECforms panel screens automatically are sent to the print file or spooled device specified after the **/PRINTFILE** qualifier.

When you specify the **/PRINTFILE** qualifier, you can specify only a spooled device name or a file name. The default for this qualifier is whatever is defined in the default definition.

Notes

The **ADD** command is the only command affected by the characteristics defined in the DDU DEFAULT definition. If you do not specify any qualifiers when you use the **ADD** command to create a new DDU definition, the definition takes the sign-in characteristics assigned in the DEFAULT definition. You can use qualifiers with the **ADD** command to override the characteristics defined with the **DEFAULT** command.

ACMS creates a DEFAULT definition the first time you run DDU, or whenever you create a new device authorization file. By default, the DDU DEFAULT definition created by ACMS has the Not Controlled and No Autologin sign-in characteristics.

Changes to definitions go into effect after you use one of the following commands:

- **ACMS/RESET TERMINALS**
- **ACMS/START TERMINALS**
- **ACMS/START SYSTEM**

Example

```
DDU> DEFAULT /NOCONTROLLED
```

This command specifies that the DEFAULT definition has the Not Controlled sign-in characteristic.

EXIT Command (DDU>)

EXIT Command (DDU>) — Ends the DDU session and returns you to the DCL prompt.

Format

EXIT

Privileges Required

None.

Notes

You can also end a session by pressing **Ctrl/Z**. Pressing **Ctrl/Z** signals the end of the file for data entered from the terminal. EXIT is displayed when you press **Ctrl/Z**.

Example

```
DDU> EXIT
$
```

This command causes you to exit from DDU and returns you to DCL.

HELP Command (DDU>)

HELP Command (DDU>) — Displays information about DDU commands and qualifiers.

Format

HELP [*topic* [...]]

Command Qualifiers	Defaults
/[NO]PROMPT	/PROMPT

Privileges Required

None.

Parameters

topic

The DDU command or topic you want to know about. If you do not specify a topic, **HELP** provides a list of topics to choose from.

Qualifiers

/[NO]PROMPT

The **/PROMPT** qualifier causes DDU help to display prompts with help information. If you use the **/NOPROMPT** qualifier, DDU help does not display prompts. **/PROMPT** is the default.

Notes

None.

Example

```
DDU> HELP DEFAULT

DEFAULT

   Changes the contents of the DEFAULT definition in the database

   Format:

       DEFAULT

   For example:

       DDU> DEFAULT /CONTROLLED

   The DEFAULT definition contains default characteristics for terminals
   defined with the ADD command


  Additional information available:

  Qualifiers
  /AUTOLOGIN /CONTROLLED

DEFAULT Subtopic?
```

This command displays help information about the **DEFAULT** command.

LIST Command (DDU>)

LIST Command (DDU>) — Writes DDU definitions to ACMSDDU.LIS in your default directory, or to an output file you specify.

Format

LIST *device-name*

Command Qualifiers	Defaults
/BRIEF	Full DDU definitions
/OUTPUT[=*file-spec*]	/OUTPUT=ACMSDDU.LIS

Privileges Required

None.

Parameters

device-name

The name of the device. Do not include a colon (:) when you specify a device name. The device name can be a logical name, a physical device name, a group device name, or the wildcard character (*). See *Table 2.1, "DDU Group Device Names"* for a list of the DDU group device names. To write all definitions to an output file, use the wildcard character instead of a device name. You can use the wildcard character as a prefix, a suffix, or both to list device names with common characters (such as TT*, *TT, or *TT*).

Qualifiers

/BRIEF

Lists only the device names in DDU definitions. The default is to list complete definitions.

/OUTPUT[=*file-spec*]

Changes the file specification for the listing file. The default file specification is ACMSDDU.LIS, in your current default directory.

Notes

None.

Examples

1. `DDU> LIST *`

   This command writes the full definitions for all device names in the device authorization to the default output file ACMSDDU.LIS.

2. `DDU> LIST VT`

   This command writes a definition for the group device name VT to the listing file ACMSDDU.LIS.

3. `DDU> LIST /BRIEF *`

   This command writes all the device names in the device authorization file to the file ACMSDDU.LIS.

4. `DDU> LIST /OUTPUT=LOCAL.LIS  *T*`

   This command writes all device definitions containing the letter T to the output file LOCAL.LIS.

MODIFY Command (DDU>)

MODIFY Command (DDU>) — Changes the sign-in characteristics in a DDU definition.

Format

MODIFY *device-name*

Command Qualifiers	Defaults
/[NO]AUTOLOGIN=*username*	From current definition
/[NO]CONTROLLED	From current definition
/PRINTFILE [= *print-file-spec* / *spooled-device-name*]	From current definition

Privileges Required

None.

Parameter

device-name

The name of the device. Do not include a colon (:) when you specify a device name. The device name can be a logical name, a physical device name, or a group device name. See *Table 2.1, "DDU Group Device Names"* for a list of the DDU group device names.

Qualifiers

/[NO]AUTOLOGIN=*user-name*

The **/AUTOLOGIN** qualifier enables automatic sign-ins for ACMS-controlled terminals. With automatic sign-in enabled, the user does not need to enter a user name to sign in to ACMS. If a password is required, the user receives the password prompt after pressing **Return**. If a password is not required, the user is signed in to ACMS as soon as **Return** is pressed on the terminal's keyboard.

ACMS places the user name you specify with the **/AUTOLOGIN** qualifier in the device authorization file and uses that user name each time a user presses **Return** at that terminal. The user name can contain 1 through 12 characters.

The **/AUTOLOGIN** qualifier has no effect unless the terminal has the Controlled sign-in characteristic. You can assign a Controlled sign-in characteristic by specifying the **/CONTROLLED** qualifier. You can disable automatic sign-ins with the **/NOAUTOLOGIN** qualifier. The default for this qualifier is whatever sign-in characteristics are currently defined in the definition you are modifying.

/[NO]CONTROLLED

The **/CONTROLLED** qualifier assigns the Controlled sign-in characteristic to a device. Users at application port terminals with the Controlled sign-in characteristic sign in directly to ACMS. Users at dedicated service port terminals sign in either directly to ACMS or not, depending on the node

they connect to at the "Local>" prompt. See *Section 2.11, "Authorizing LAT Terminal Ports as Controlled Terminals"* for a description of application ports and dedicated service ports.

The **/NOCONTROLLED** qualifier assigns the Not Controlled sign-in characteristic to a device. Users at terminals with the Not Controlled characteristic log in directly to OpenVMS. For access to ACMS, a user must enter the **ACMS/ENTER** command.

When you specify the **/CONTROLLED** qualifier, you can specify only a physical device name or the group device names TT and LT. See *Table 2.1, "DDU Group Device Names"* for a description of the DDU group device names. The default for this qualifier is whatever is currently defined in the definition you are modifying.

Note

The ACMS Terminal Subsystem Controller (TSC) does not support dialup lines as ACMS-controlled terminals. Because the TSC keeps a channel to ACMS-controlled terminals even when the user signs out, the modem does not receive any hangup notification. If you operate a terminal using ACMS over dialup lines, you must first log in to OpenVMS, and then issue the **ACMS/ENTER/NORETURN** command. The **/NORETURN** qualifier deletes the OpenVMS process after you enter ACMS.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

The **/PRINTFILE** qualifier assigns the Printfile characteristic to a device. The PRINT response must appear in the form source IFDL file, and a print key must also be defined there. When the user presses the print key, the DECforms panel screens automatically are sent to the print file or spooled device specified after the **/PRINTFILE** qualifier.

When you specify the **/PRINTFILE** qualifier, you can specify only a spooled device name or a file name. The default for this qualifier is whatever sign-in characteristics are currently defined in the definition you are modifying.

The DDU **MODIFY** command does not invoke an editor.

Notes

Changes to definitions go into effect after you use one of the following commands:

- **ACMS/RESET TERMINALS**
- **ACMS/START TERMINALS**
- **ACMS/START SYSTEM**

The DDU **MODIFY** command does not invoke an editor.

Examples

1. DDU> **MODIFY TTE3 /NOCONTROLLED**

   This command removes the Controlled characteristic from terminal TTE3. Users log in directly to OpenVMS at terminal TTE3.

2. DDU> **MODIFY TTE4 /AUTOLOGIN=EVARD /CONTROLLED**

This command assigns the Autologin and Controlled characteristics to terminal TTE4. User EVARD signs in directly to ACMS at terminal TTE4 by pressing the **Return** and typing a password.

3. DDU> **MODIFY TTE5 /PRINTFILE=SPOOLDEV::TXA0:**

   This command assigns the Printfile characteristic to terminal TTE5 and specifies spooled device SPOOLDEV::TXA0: as the device for any DECforms panel screens to be printed when the user presses the Print key.

REMOVE Command (DDU>)

REMOVE Command (DDU>) — Removes a DDU definition from the device authorization file.

Format

REMOVE *device-name*

Parameters

device-name

The name of the device. Do not include a colon (:) when you specify a device name. The device name can be a logical name, a physical device name, or a group device name. See *Table 2.1, "DDU Group Device Names"* for a list of the DDU group device names.

Privileges Required

None.

Notes

To restrict a terminal to OpenVMS use only, delete the definition for the $ALL group device name (if the device authorization file contains one), and then delete the definition for the terminal.

You cannot remove the DEFAULT definition from the DDU device authorization file.

Changes to definitions go into effect after you use one of the following commands

- **ACMS/RESET TERMINALS**
- **ACMS/START TERMINALS**
- **ACMS/START SYSTEM**

Examples

1. DDU> **REMOVE TTE5**
   ```
   Device TTE5          has been removed from the database
   ```

   This command deletes the device definition for TTE5. If the device authorization file does not contain a $ALL definition, this command removes terminal TTE5 for use with ACMS.

2.
```
DDU> REMOVE $ALL
Device $ALL          has been removed from the database
```

   This command deletes the $ALL definition. The command deauthorizes all terminals that do not have individual device definitions.

RENAME Command (DDU>)

RENAME Command (DDU>) — Changes the device name in a DDU definition.

Format

RENAME *old-device-name new-device-name*

Command Qualifiers	Defaults
/[NO]AUTOLOGIN=*username*	From old definition
/[NO]CONTROLLED	From old definition
/PRINTFILE [= *print-file-spec* *spooled-device-name*]	From old definition

Privileges Required

None.

Parameters

old-device-name

The device name in the definition you are changing. The device name can be a logical name, a physical device name, or a group device name. Do not include a colon (:) when you specify a device name. See *Table 2.1, "DDU Group Device Names"* for a list of the DDU group device names.

new-device-name

The new name for the device. The new device name cannot already exist in the device authorization file. See the description of old-device-name for syntax rules.

Qualifiers

/[NO]AUTOLOGIN=*user-name*

The **/AUTOLOGIN** qualifier enables automatic sign-ins for ACMS-controlled terminals. With automatic sign-in enabled, the user does not need to enter a user name to sign in to ACMS. If a password is required, the user receives the password prompt after pressing **Return**. If a password is not required, the user is signed in to ACMS as soon as **Return** is pressed on the terminal's keyboard.

ACMS places the user name you specify with the **/AUTOLOGIN** qualifier in the device authorization file and uses that user name each time a user presses **Return** at that terminal. The user name can contain 1 through 12 characters.

The **/AUTOLOGIN** qualifier has no effect unless the terminal has the Controlled sign-in characteristic. Assign a Controlled sign-in characteristic by specifying the **/CONTROLLED** qualifier. Disable automatic sign-ins with the **/NOAUTOLOGIN** qualifier. The default for this qualifier is whatever sign-in characteristics are defined in the original definition.

/[NO]CONTROLLED

The **/CONTROLLED** qualifier assigns the Controlled sign-in characteristic to a device. Users at application port terminals with the Controlled sign-in characteristic sign in directly to ACMS. Users at dedicated service port terminals sign in either directly to ACMS or not, depending on the node they connect to at the "Local>" prompt. See *Section 2.11, "Authorizing LAT Terminal Ports as Controlled Terminals"* for a description of application ports and dedicated service ports.

The **/NOCONTROLLED** qualifier assigns the Not Controlled sign-in characteristic to a device. Users at terminals with the Not Controlled characteristic log in directly to OpenVMS. For access to ACMS, a user must enter the **ACMS/ENTER** command.

When you specify the **/CONTROLLED** qualifier, you can specify only a physical device name or the group device names TT and LT. See *Table 2.1, "DDU Group Device Names"* for a description of the DDU group device names. The default for this qualifier is whatever sign-in characteristics are defined in the original definition.

Note

The ACMS Terminal Subsystem Controller (TSC) does not support dialup lines as ACMS-controlled terminals. Because the TSC keeps a channel to ACMS-controlled terminals even when the user signs out, the modem does not receive any hangup notification. If you operate a terminal using ACMS over dialup lines, you must first log in to OpenVMS, and then issue the **ACMS/ENTER/NORETURN** command. The **/NORETURN** qualifier deletes the OpenVMS process after you enter ACMS.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

The **/PRINTFILE** qualifier assigns the Printfile characteristic to a device. The PRINT response must appear in the form source IFDL file, and a print key must also be defined there. When the user presses the print key, the DECforms panel screens automatically are sent to the print file or spooled device specified after the **/PRINTFILE** qualifier.

When you specify the **/PRINTFILE** qualifier, you can specify only a spooled device name or a file name. The default for this qualifier is whatever sign-in characteristics are currently defined in the original definition.

Notes

You cannot rename the DEFAULT definition.

Changes to definitions go into effect after you use one of the following commands:

- **ACMS/RESET TERMINALS**
- **ACMS/START TERMINALS**
- **ACMS/START SYSTEM**

Examples

1. DDU> **RENAME TTE7 TTE6 /CONTROLLED**

   This command changes the device name of terminal TTE7 to TTE6 and assigns the Controlled sign-in characteristic. Terminal TTE7 is no longer authorized.

2. DDU> **RENAME TTE6 TTE7 /NOCONTROLLED**

   This command changes the device name of terminal TTE6 to TTE7 and removes the Controlled characteristic from the definition. Users log in to OpenVMS from terminal TTE7 and enter ACMS using the **ACMS/ENTER** command. Terminal TTE6 is no longer authorized.

SHOW Command (DDU>)

SHOW Command (DDU>) — Displays DDU definitions.

Format

SHOW *device-name*

Command Qualifiers	Defaults
/BRIEF	Full definition

Privileges Requires

None.

Parameters

device-name

The name of the device. Do not include a colon (:) when you specify a device name. The device name can be a logical name, a physical device name, a group device name, or the wildcard character (*). See *Table 2.1, "DDU Group Device Names"* for a list of the DDU group device names. You can use the wildcard character as a prefix, a suffix, or both to specify a partial device name (such as TT*, *TT, or *TT*).

Qualifiers

/BRIEF

Displays only device names. DDU displays complete definitions by default.

Notes

To display all definitions, use the wildcard character (*) as the parameter.

Examples

1. DDU> **SHOW ***

```
Device Name:            DEFAULT         NOT CONTROLLED
No Autologin
Printfile:

Device Name:            LT              NOT CONTROLLED
No Autologin
Printfile:

Device Name:            LTA902          CONTROLLED
Autologin Username:     TURKLES
Printfile:

Device Name:            TT              NOT CONTROLLED
No Autologin
Printfile:

Device Name:            TTB5            NOT CONTROLLED
No Autologin
Printfile:

Device Name:            VTA65           NOT CONTROLLED
No Autologin
Printfile:
```

This command displays the full device definitions for all devices authorized in the device authorization file.

2.
```
DDU> SHOW * /BRIEF
Device Name:    DEFAULT
Device Name:    LT
Device Name:    LTA901
Device Name:    LTA902
Device Name:    LTA903
Device Name:    LTA904
Device Name:    PT
Device Name:    RT
Device Name:    TT
Device Name:    TTA9
Device Name:    TTB5
Device Name:    TTE5
Device Name:    VT
Device Name:    VTA65
```

This command displays just the device names for all devices authorized in the device authorization file.

3.
```
DDU> SHOW TTE4
Device Name:          TTE4              CONTROLLED
Autologin Username:   MILLER
```

This command displays the full device definition for terminal TTE4.

4.
```
DDU> SHOW VT
Device Name:           VT               NOT CONTROLLED
No Autologin
```

This command displays the device definition that authorizes virtual terminals to have access to your ACMS system.

5.
```
DDU> SHOW *E*
Device Name:            DEFAULT          NOT CONTROLLED
No Autologin
Printfile:

Device Name:            TTE5             NOT CONTROLLED
No Autologin
Printfile:     SPOOLDEV::TXA0:

Device Name:            TTE6             NOT CONTROLLED
No Autologin
```

   This command displays all device definitions for terminals containing the letter E.

Chapter 18. UDU Commands

This chapter contains reference information and examples for the ACMS User Definition Utility (UDU) commands. See *Chapter 3, "Authorizing Users"* for more information on the UDU commands and their functions.

ADD Command (UDU>)

ADD Command (UDU>) — Authorizes and assigns sign-in characteristics to ACMS users by adding UDU definitions to the user authorization file (ACMSUDF.DAT). You can use qualifiers to assign sign-in characteristics or let new definitions receive information from the UDU DEFAULT definition.

Format

ADD *user-name*

Command Qualifiers	**Defaults**
/[NO]AGENT	From DEFAULT definition
/[NO]DISPLAY_MENU	From DEFAULT definition
/[NO]FINAL=(*keyword*[,...])	From DEFAULT definition
/[NO]INITIAL=(*keyword*[,...])	From DEFAULT definition
/LANGUAGE=*language-name*	From DEFAULT definition
/MDB=*menu-database-file*	From DEFAULT definition
/MENU[=*menu-path-name*]	From DEFAULT definition
/PRINTFILE [= *print-file-spec* *spooled-device-name*]	From DEFAULT definition
/[NO]SKIPMENULANGUAGE	From DEFAULT definition

Privileges Required

None.

Parameters

user-name

The OpenVMS user name in the definition you are creating. The user name can be $ALL.

Qualifiers

/[NO]AGENT

Enables an agent to submit a task that has a user name different from the user name of the agent process. You must use the **/AGENT** qualifier to authorize the Command Process (CP) and the

Queued Task Initiator (QTI) as agents. If your system has other agent programs that submit tasks of this type, you must also authorize them with the **/AGENT** qualifier. You must use the **/AGENT** qualifier for any user name that a detached task runs under. Use the **/NOAGENT** qualifier when an agent program no longer submits tasks for processing that run under user names other than the submitting agent program. The default is taken from the DEFAULT definition.

/[NO]DISPLAY_MENU

Enables the menu display identified in the user's definition and the Selection: prompt once the user signs in. A menu is identified by a menu path name and a menu database file. If a user's definition has the NODISPLAY_MENU characteristic, ACMS displays only the Selection: prompt after the user signs in, without a full default menu. The **/NODISPLAY_MENU** qualifier disables the menu display. The default is taken from the DEFAULT definition.

/[NO]FINAL=(*keyword*[,...])

Specifies a task that is run when the user exits from ACMS. The default is taken from the DEFAULT definition.

Specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

  Specifies the application in which the final task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

  Specifies that errors in the final task are ignored. If an error occurs in the final task, ACMS does not display an error message or record information about the error in the audit trail log file.

- **[NO]SELECTION_STRING="*string*"**

  Specifies a parameter required by the final task. For example, if the final task is an editor, "*string*" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the final task. When you specify the **TASK** keyword, you must also specify an application name with the **APPLICATION** keyword.

/[NO]INITIAL=(*keyword*[,...])

Specifies the task that is run when the user enters the ACMS environment. The default is taken from the DEFAULT definition.

Specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

  Specifies the application in which the initial task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

Specifies that errors in the initial task are ignored. By default, if an error occurs in an initial task, an error message is displayed on the user's terminal, the reason for the error is recorded in the audit trail log, and the user is signed out of ACMS.

- **[NO]SELECTION_STRING="*string*"**

  Specifies a parameter required by the initial task. For example, if the initial task is an editor, "*string*" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the initial task. When you specify the **TASK** keyword, you must also specify an application name with the **APPLICATION** keyword.

/LANGUAGE=*language-name*

Assigns a language to a user in a UDU definition. ACMS matches the language assigned to a user with the language assigned to a DECforms form layout and displays panels in the selected language. The default is taken from the DEFAULT definition.

/MDB=*menu-database-file*

Assigns a menu database file to a UDU definition. A menu database file is a file of run-time menu definitions created by the Application Definition Utility (ADU) **BUILD** command. The ACMS run-time system assumes ACMS$DIRECTORY as the default directory and .MDB as the default file type for menu database files in UDU definitions. If you do not specify the **/MDB** qualifier, the name of the menu database file is taken from the DEFAULT definition.

/MENU[=*menu-path-name*]

Assigns a menu to a UDU definition. The menu path name is the location of a run-time menu definition in a menu database file. Users cannot see menus whose path names are higher in the menu tree than their default menu path names. Path names for all menus except the highest menu consist of strings of menu keywords. If you do not know the path name to include with the **/MENU** qualifier, you can derive the menu path name from menu keywords, as explained in *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/].

You can define menu entries that contain slashes in the menu definition; however, you cannot specify menu paths containing these slashes in the UDU.

For example, the following format is *not* allowed:

```
UDU> MODIFY SMITH /MENU="TOP/V32.SUBMENU"
```

If you do not specify a menu path name, the user receives the path name defined in the DEFAULT definition. If there is no path name defined in the DEFAULT definition, a blank path name is assigned. When signing in with a blank path name assigned, the user receives the top menu in the menu database file.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

Use this qualifier to specify a file name or spooled device name for a user. When a form is enabled, ACMS uses the Printfile specification for a device assigned in DDU, if it is available. If it is not, ACMS uses the Printfile specification for the user.

To use the Printfile feature, you must also include a PRINT response step in the DECforms source IDFL file that contains the specifications of the panel that you want to print.

/[NO]SKIPMENULANGUAGE

Use this qualifier with the **/LANGUAGE** qualifier to specify that a language is to be assigned to a user for all DECforms forms except menu forms. For example, with the **/SKIPMENULANGUAGE** qualifier you can specify that DECforms display all panels in French except menu panels.

Notes

Create a user definition for the CP using the **/AGENT** qualifier. This action authorizes the CP as an agent.

Specifying the $ALL user name authorizes and assigns sign-in characteristics to users who do not have separate definitions. If the user authorization file, ACMSUDF.DAT, does not contain a $ALL definition, each ACMS user needs a separate definition.

The menu database file, menu path names, and OpenVMS account must be created before a user can sign in. However, you can add a menu database file specification or default menu path name to a UDU definition before the menu database file or menu path name exists. You can create a definition for a user before the user has an OpenVMS account.

Examples

1. UDU> **ADD CONNOR**

   This command creates a new definition for the user name CONNOR. Because the command has no qualifiers, the new definition receives information from the DEFAULT definition.

2. UDU> **ADD CMDPRCSS /AGENT**

   This command authorizes the CP as an agent. ACMS requires you to create a user definition for the CP and also for any other task submitting agent that processes tasks running under user names different from that of the Command Process. The user name of the Command Process (CMDPRCSS) is defined with the ACMSGEN Utility.

3. UDU> **ADD $ALL /MENU=PERSONNEL**

   This command creates a $ALL definition authorizing all OpenVMS users to sign in to ACMS. The **/MENU** qualifier assigns the default menu path name PERSONNEL to the $ALL definition. The $ALL definition receives the remaining information from the DEFAULT definition. ACMS uses the $ALL definition for users who do not have separate user definitions.

4. UDU> **ADD CONNOR /MDB=WORKDISK$:[CONNOR]ACMS.MDB /MENU=PERSONNEL**

   This command creates a new definition for CONNOR. The **/MDB** and **/MENU** qualifiers assign to CONNOR the menu path name PERSONNEL and the menu database file WORKDISK$:[CONNOR]ACMS.MDB.

5. UDU> **ADD BELLOW /INITIAL=(APPLICATION=ACCOUNTING, -**
   _UDU> **TASK=LOGGING_PROG,SELECTION_STRING="LOG.DAT")**

   This command creates a new definition for BELLOW. The **/INITIAL** qualifier specifies that the task LOGGING_PROG in application ACCOUNTING is run when BELLOW signs in. Task LOGGING_PROG displays the file LOG.DAT, which verifies BELLOW's booking information.

ADD /PROXY Command (UDU>)

ADD /PROXY Command (UDU>) — Adds a user proxy to the ACMS proxy file (ACMSPROXY.DAT). Before you can use the **ADD /PROXY** command, you must have already created a proxy file using the **CREATE /PROXY** command.

Format

ADD /PROXY *remote-node::remote-user local-user*

Parameters

remote-node

Specifies a remote node name (1 to 6 alphanumeric characters). If you substitute an asterisk, the specified <remote-user> on all nodes is authorized to submit tasks under the user name specified by the <local-user> parameter.

remote-user

Specifies the user name of a user at a remote node. A valid user name is a string of 1 to 12 alphanumeric characters and can contain underscores and dollar signs. If you use an asterisk, all users on the specified <remote-node> are authorized to submit tasks under the user name specified by the <local-user> parameter.

local-user

Specifies the user name of the user on the local application node. If you specify an asterisk, the local user name is the same as the remote user name. You can specify only one <local-user> for each <remote-node>::<remote-user> combination.

Notes

UDU does not check that the <local-user> name you enter is unique. Use the **SHOW /PROXY *::*** command to obtain a list of <local-user> names.

When you add a proxy, UDU interprets the <remote-node>::<remote-user> and <local-user> parameters as text strings, and each parameter is stored as specified, including any asterisks. However, at run time, ACMS interprets the asterisk as a wildcard.

You cannot partially wildcard any parameters with the **ADD /PROXY** command. For example, if a user specifies <remote-node>::<remote-user> as COMET::PERS*, UDU returns the error message, "Invalid remote user proxy specification."

Before you create a proxy file, set default to the appropriate directory, such as SYS$SYSTEM, or define a logical for the proper directory location for the proxy file.

Examples

Note

The following examples assume that the proxy file is empty.

1. `UDU> CREATE /PROXY`

```
UDU> ADD /PROXY COMET::PERSONNEL PERS_USER
UDU> SHOW /PROXY *
Remote User: COMET::PERSONNEL                Local User: PERS_USER
```

In this example, the **ADD** command adds a single proxy that allows the user on node COMET with user name PERSONNEL to select a task on the application node using the user name of PERS_USER.

2.
```
UDU> ADD /PROXY COMET::* RENTAL_AGENT
UDU> SHOW /PROXY *
Remote User: COMET::*                        Local User: RENTAL_AGENT
Remote User: COMET::PERSONNEL                Local User: PERS_USER
```

In this example, the **ADD** command specifies that any remote user except PERSONNEL on node COMET can select a task on the application node using the user name RENTAL_AGENT. When user PERSONNEL on node COMET selects a task on the application node, the local user name is PERS_USER, because there is a specific proxy for COMET::PERSONNEL. The asterisk is interpreted as a literal in the **ADD /PROXY** command.

3.
```
UDU> ADD /PROXY *::BICKFORD *
UDU> SHOW /PROXY *
Remote User: *::BICKFORD                     Local User:*
Remote User: COMET::*                        Local User: RENTAL_AGENT
Remote User: COMET::PERSONNEL                Local User: PERS_USER
```

In this example, the **ADD** command specifies that remote task submitters with the user name BICKFORD on any remote node can select a task on the application node using the same user name

COPY Command (UDU>)

COPY Command (UDU>) — Authorizes and assigns sign-in characteristics to ACMS users by creating new UDU definitions from existing UDU definitions. With qualifiers, you can assign different sign-in characteristics to the new definitions.

Format

COPY *source-user-name new-user-name*

Command Qualifiers	**Defaults**
/[NO]AGENT	From source definition
/[NO]DISPLAY_MENU	From source definition
/[NO]FINAL=(*keyword*[,...])	From source definition
/[NO]INITIAL=(*keyword*[,...])	From source definition
/LANGUAGE=*language-name*	From source definition
/MDB=*menu-database-file*	From source definition
/MENU[=*menu-path-name*]	From source definition
/PRINTFILE [= *print-file-spec* *spooled-device-name*]	From source definition
/[NO]SKIPMENULANGUAGE	From source definition

Privileges Required

None.

Parameters

source-user-name

The OpenVMS user name in the source definition. The source user name can be $ALL.

new-user-name

The OpenVMS user name for the new definition. The new user name can be $ALL.

Qualifiers

/[NO]AGENT

The **/AGENT** qualifier enables an agent to submit a task that has a user name different from the user name of the agent process. You must use the **/AGENT** qualifier to authorize the CP and the QTI as agents. If your system has other agent programs that submit tasks of this type, you must also authorize them with the **/AGENT** qualifier. You must use the **/AGENT** qualifier for any user name that a detached task runs under. Use the **/NOAGENT** qualifier when an agent program no longer submits tasks for processing that run under user names other than the submitting agent program. The default is whatever is defined in the source definition.

/[NO]DISPLAY_MENU

The **/DISPLAY_MENU** qualifier enables the menu display identified in the user's definition and the Selection: prompt once the user signs in. A menu is identified by a menu path name and a menu database file. If a user's definition has the **NODISPLAY_MENU** characteristic, ACMS displays only the Selection: prompt after the user signs in, without a full default menu. The **/NODISPLAY_MENU** qualifier disables the menu display. The default is whatever is defined in the source definition.

/[NO]FINAL=(*keyword*[,...])

Specifies a task that is run when the user exits from ACMS. If you do not specify the **/[NO]FINAL** qualifier, the default is taken from the source definition.

Specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

  Specifies the application in which the final task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

  Specifies that errors in the final task are ignored. If an error occurs in the final task, ACMS does not display an error message or record information about the error in the audit trail log file.

- **[NO]SELECTION_STRING="*string*"**

  Specifies a parameter required by the final task. For example, if the final task is an editor, "*string*" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the final task.

/[NO]INITIAL=(*keyword*[,...])

Specifies the task that is run when the user enters the ACMS environment. The default is taken from the source definition.

Specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

  Specifies the application in which the initial task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

  Specifies that errors in the initial task are ignored. By default, if an error occurs in an initial task, an error message is displayed on the user's terminal, the reason for the error is recorded in the audit trail log, and the user is signed out of ACMS.

- **[NO]SELECTION_STRING="*string*"**

  Specifies a parameter required by the initial task. For example, if the initial task is an editor, "string" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the initial task.

/LANGUAGE[=*language-name*]

Assigns a language to a user in a UDU definition. ACMS matches the language assigned to a user with the language assigned to a DECforms form layout and displays panels in the selected language. The default is taken from the source definition.

/MDB=*menu-database-file*

Assigns a menu database file to a UDU definition. A menu database file is a file of run-time menu definitions created by the Application Definition Utility (ADU) **BUILD** command. The ACMS run-time system assumes ACMS$DIRECTORY as the default directory and .MDB as the default file type for menu database files in UDU definitions. The default is whatever is defined in the source definition.

/MENU[=*menu-path-name*]

Assigns a menu to a UDU definition. The menu path name is the location of a run-time menu definition in a menu database file. Users cannot see menus whose path names are higher in the menu tree than their default menu path names. Path names for all menus except the highest menu consist of strings of menu keywords. If you do not know the path name to include with the **/MENU** qualifier, you can derive the menu path name from menu keywords, as explained in *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/].

You can define menu entries that contain slashes in the menu definition; however, you cannot specify menu paths containing these slashes in the UDU.

For example, the following format is *not* allowed:

```
UDU> MODIFY SMITH /MENU="TOP/V32.SUBMENU"
```

If you do not specify a path name and there is no path name defined in the source definition, the user receives a blank path name. When a blank path name is defined, the user receives the top menu in the menu database file when signing in.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

Use this qualifier to specify a file name or spooled device name for a user. When a form is enabled, ACMS uses the Printfile specification for a device assigned in DDU, if it is available. If it is not, ACMS uses the Printfile specification for the user.

To use the Printfile feature, you must also include a PRINT response step in the DECforms source IDFL file that contains the specifications of the panel that you want to print.

/[NO]SKIPMENULANGUAGE

Use this qualifier with the **/LANGUAGE** qualifier to specify that a language is to be assigned to a user for all DECforms forms except menu forms. For example, with the **/SKIPMENULANGUAGE** qualifier you can specify that DECforms display all panels in French except menu panels.

Notes

None.

Examples

1. UDU> **COPY COURTS WILSON**

   This command creates a user definition for WILSON, copying all the information from the definition for COURTS.

2. UDU> **COPY TRACY MORRIS /MENU=EMPLOYEE**

   This command creates a user definition for MORRIS, copying information from the definition for TRACY. The **/MENU** qualifier assigns MORRIS a different default menu path name, EMPLOYEE.

3. UDU> **COPY STEVENS SMITH /MENU**

   This command creates a user definition for SMITH, copying information from the definition for STEVENS. The **/MENU** qualifier overrides the path name from the STEVENS definition, so the definition for SMITH receives a blank path name. After signing in, SMITH receives the top menu in the menu database file.

CREATE /PROXY Command (UDU>)

CREATE /PROXY Command (UDU>) — Creates an empty ACMS proxy file (ACMSPROXY.DAT).

Format

CREATE /PROXY

Note

Creates an empty ACMS proxy file, ACMSPROXY.DAT. If you define the ACMSPROXY logical name and then enter the UDU **CREATE /PROXY** command, the empty proxy file is created at the location defined by the ACMSPROXY logical name. If you do not define the ACMSPROXY logical name, UDU creates ACMSPROXY.DAT in your current directory. If the proxy file already exists, UDU returns an error message.

Example

```
UDU> CREATE /PROXY
```

This command creates an ACMS proxy file.

DEFAULT Command (UDU>)

DEFAULT Command (UDU>) — Changes information in the UDU DEFAULT definition. If you omit one or more qualifiers from an **ADD** command, the resulting new definition receives information from the existing DEFAULT definition.

Format

DEFAULT

Command Qualifiers	Defaults
/[NO]AGENT	From existing DEFAULT definition
/[NO]DISPLAY_MENU	From existing DEFAULT definition
/[NO]FINAL=(*keyword*[,...])	From existing DEFAULT definition
/[NO]INITIAL=(*keyword*[,...])	From existing DEFAULT definition
/LANGUAGE=*language-name*	From existing DEFAULT definition
/MDB=*menu-database-file*	From existing DEFAULT definition
/MENU[=*menu-path-name*]	From existing DEFAULT definition
/PRINTFILE [= *print-file-spec* / *spooled-device-name*]	From existing DEFAULT definition
/[NO]SKIPMENULANGUAGE	From existing DEFAULT definition

Privileges Required

None.

Qualifiers

/[NO]AGENT

The **/AGENT** qualifier enables an agent to submit a task that has a user name different from the user name of the agent process. You must use the **/AGENT** qualifier to authorize the CP and the QTI as agents. If your system has other agent programs that submit tasks of this type, you must also

authorize them with the **/AGENT** qualifier. You must use the **/AGENT** qualifier for any user name that a detached task runs under. Use the **/NOAGENT** qualifier when an agent program no longer submits tasks for processing that run under user names other than the submitting agent program.

/[NO]DISPLAY_MENU

The **/DISPLAY_MENU** qualifier enables the menu display identified in the user's definition and the Selection: prompt once the user signs in. A menu is identified by a menu path name and a menu database file. If a user's definition has the NODISPLAY_MENU characteristic, ACMS displays only the Selection: prompt after the user signs in, without a full default menu. The **/NODISPLAY_MENU** qualifier disables the menu display.

/[NO]FINAL=(*keyword*[,...])

Specifies a task that is run when the user exits from ACMS. If you do not specify the **/[NO]FINAL** qualifier, the default is taken from the current DEFAULT definition.

Specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

  Specifies the application in which the final task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

  Specifies that errors in the final task are ignored. If an error occurs in the final task, ACMS does not display an error message or record information about the error in the audit trail log file.

- **[NO]SELECTION_STRING="*string*"**

  Specifies a parameter required by the final task. For example, if the final task is an editor, "*string*" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the final task.

/[NO]INITIAL=(*keyword*[,...])

Specifies the task that is run when the user enters the ACMS environment. The default is taken from the current DEFAULT definition.

Specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

  Specifies the application in which the initial task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

  Specifies that errors in the initial task are ignored. By default, if an error occurs in an initial task, an error message is displayed on the user's terminal, the reason for the error is recorded in the audit trail log, and the user is signed out of ACMS.

- **[NO]SELECTION_STRING="*string*"**

  Specifies a parameter required by the initial task. For example, if the initial task is an editor, "*string*" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the initial task.

/LANGUAGE[=*language-name*]

Assigns a language to a user in a UDU definition. ACMS matches the language assigned to a user with the language assigned to a DECforms form layout and displays panels in the selected language. The default is taken from the existing DEFAULT definition.

/MDB=*menu-database-file*

Assigns a menu database file to a UDU definition. A menu database file is a file of run-time menu definitions created by the Application Definition Utility (ADU) **BUILD** command. The ACMS run-time system assumes ACMS$DIRECTORY as the default directory and .MDB as the default file type for menu database files in UDU definitions.

/MENU[=*menu-path-name*]

Assigns a menu to a UDU definition. The menu path name is the location of a run-time menu definition in a menu database file. Users cannot see menus whose path names are higher in the menu tree than their default menu path names. Path names for all menus except the highest menu consist of strings of menu keywords. If you do not know the path name to include with the **/MENU** qualifier, you can derive the menu path name from menu keywords, as explained in the *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/].

You can define menu entries that contain slashes in the menu definition; however, you cannot specify menu paths containing these slashes in the UDU.

For example, the following format is *not* allowed:

```
UDU> MODIFY SMITH /MENU="TOP/V32.SUBMENU"
```

If you do not specify a path name and there is no default path name defined in the existing DEFAULT definition, the user receives a blank path name. If a blank path name is defined, the user receives the top menu in the menu database file.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

Use this qualifier to specify a file name or spooled device name for a user. When a form is enabled, ACMS uses the Printfile specification for a device assigned in DDU, if it is available. If it is not, ACMS uses the Printfile specification for the user.

To use the Printfile feature, you must also include a PRINT response step in the DECforms source IDFL file that contains the specifications of the panel that you want to print.

/[NO]SKIPMENULANGUAGE

Use this qualifier with the **/LANGUAGE** qualifier to specify that a language is to be assigned to a user for all DECforms forms except menu forms. For example, with the **/SKIPMENULANGUAGE** qualifier you can specify that DECforms display all panels in French except menu panels.

Notes

ACMS creates a DEFAULT definition the first time you run UDU, or when you create a new user authorization file. ACMS assigns to the DEFAULT definition an initial display of the top-level menu and selection prompt, the menu database file specification ACMS$DIRECTORY:ACMS.MDB, and a blank menu path name.

The **ADD** command is the only command affected by the DEFAULT definition. When you use the **ADD** command to create a new UDU definition, the new definition takes the default information assigned in the DEFAULT definition. You can use qualifiers with the **ADD** command to override information from the DEFAULT definition.

Examples

1. `UDU> DEFAULT /MENU=EMPLOYEE`

   This command assigns the default menu EMPLOYEE to the DEFAULT definition.

2. `UDU> DEFAULT /MENU`

   This command assigns a blank menu path name to the DEFAULT definition. The user receives the top menu in the menu database file.

EXIT Command (UDU>)

EXIT Command (UDU>) — Ends the UDU session and returns you to DCL level.

Format

EXIT

Privileges Required

None.

Note

You can also type **Ctrl/Z** to end a UDU session. **Ctrl/Z** signals the end of the file for data entered from the terminal. **Ctrl/Z** is displayed as **EXIT**.

Example

```
UDU> EXIT
$
```

This command ends a UDU session and returns you to the DCL prompt.

HELP Command (UDU>)

HELP Command (UDU>) — Displays information about UDU commands and qualifiers.

Format

HELP [*topic* [...]]

Command Qualifiers	Defaults
/[NO]PROMPT	/PROMPT

Privileges Required

None.

Parameters

topic

The UDU topic you want information about. If you do not supply a topic, **HELP** provides you with a list of topics to choose from.

Qualifiers

/[NO]PROMPT

Controls whether or not you receive prompts for topic and subtopic. The **/PROMPT** qualifier displays help prompts. The default is **/PROMPT**. With the **/NOPROMPT** qualifier, the **HELP** command does not display prompts.

Notes

None.

Example

```
UDU> HELP LIST

LIST

   Writes User Definition Utility definitions to an output file.

   Format:

       LIST user-name

   For example:

       UDU> LIST *


  Additional information available:

  Parameter  Qualifiers
  /OUTPUT    /BRIEF
```

```
LIST Subtopic?
Topic?
```

This command displays information about the UDU **LIST** command.

LIST Command (UDU>)

LIST Command (UDU>) — Writes UDU definitions to ACMSUDU.LIS in your default directory, or to an output file you specify.

Format

LIST *user-name*

Command Qualifiers	Defaults
/BRIEF	Full definition
/OUTPUT[=*file-spec*]	/OUTPUT[=*file-spec*]

Privileges Required

None.

Parameters

user-name

The OpenVMS user name of the definition you are listing. You can use the wildcard character (*), $ALL, or DEFAULT as the user name. You can use the wildcard character to represent a partial user name.

Qualifiers

/BRIEF

Lists only the OpenVMS user names in definitions. The default is to list complete definitions.

/OUTPUT[=*file-spec*]

Copies one or more user definitions to a file you name. If you do not include a file specification, UDU uses the ACMSUDU.LIS file by default and puts the list file in your current default directory.

Notes

To write all definitions to an output file, use the wildcard character (*) as the user name.

To print the listing file, use the DCL **PRINT** command after you have finished your UDU session. To display the contents of an output file, use the DCL **TYPE** command.

Examples

1. UDU> **LIST CONNOR**

This command writes the definition for CONNOR to the ACMSUDU.LIS output file.

2. UDU> **LIST * /BRIEF**

   This command writes the user names in all UDU definitions to the output file ACMSUDU.LIS.

3. UDU> **LIST ***

   The **LIST** command with the wildcard character (*) writes all definitions in the user authorization file (ACMSUDF.DAT) to the output file ACMSUDU.LIS.

4. UDU> **LIST B***

   This command uses the wildcard character (*) to write the definitions for user names beginning with the letter B to an output file.

LIST /PROXY Command (UDU>)

LIST /PROXY Command (UDU>) — Writes all the proxies in the ACMS proxy file to the output file ACMSPROXY.LIS. You can use the **/OUTPUT** qualifier to specify a different output file name.

Format

LIST /PROXY

Command Qualifiers	Defaults
/OUTPUT[=*file-spec*]	ACMSPROXY.LIS

Qualifiers

/OUTPUT=*file-spec*

Use this qualifier to specify a file name for the output listing file. Replace the parameter <file-spec> with the new output file name, which can be any valid OpenVMS file specification.

By default, the listing file is created in the current directory with the name ACMSPROXY.LIS.

Note

Creates a listing file of all the proxies in the ACMS proxy file. You can use the optional **/OUTPUT** qualifier to override the default listing file specification.

Examples

1. UDU> **LIST /PROXY**

   This command creates a listing file of all the proxies in the ACMS proxy file. The listing file is created in the current directory and is named ACMSPROXY.LIS.

2. UDU> **LIST /PROXY /OUTPUT=DISK1$:[DATA]ALL_REMOTE_USERS.LIS**

This command creates the listing file ALL_REMOTE_USERS.LIS in the DISK1$:[DATA] directory. The listing file contains all proxies in the ACMS proxy file.

MODIFY Command (UDU>)

MODIFY Command (UDU>) — Changes the user information by allowing you to change information in UDU definitions.

Format

MODIFY *user-name*

Command Qualifiers	Defaults
/[NO]AGENT	From existing definition
/[NO]DISPLAY_MENU	From existing definition
/[NO]FINAL=(*keyword*[,...])	From existing definition
/[NO]INITIAL=(*keyword*[,...])	From existing definition
/LANGUAGE=*language-name*	From existing definition
/MDB=*menu-database-file*	From existing definition
/MENU[=*menu-path-name*]	From existing definition
/PRINTFILE [= *print-file-spec* *spooled-device-name*]	From existing definition
/[NO]SKIPMENULANGUAGE	From existing definition

Privileges Required

None.

Parameter

user-name

The OpenVMS user name in the definition you are changing. The user name can be $ALL.

Qualifiers

/[NO]AGENT

The **/AGENT** qualifier enables an agent to submit a task that has a user name different from the user name of the agent process. You must use the **/AGENT** qualifier to authorize the CP and the QTI as agents. If your system has other agent programs that submit tasks of this type, you must also authorize them with the **/AGENT** qualifier. You must use the **/AGENT** qualifier for any user name that a detached task runs under. Use the **/NOAGENT** qualifier when an agent program no longer submits tasks for processing that run under user names other than the submitting agent program. The default is taken from the existing definition.

/[NO]DISPLAY_MENU

The **/DISPLAY_MENU** qualifier enables the menu display identified in the user's definition and the Selection: prompt once the user signs in. A menu is identified by a menu path name and a menu database file. If a user's definition has the NODISPLAY_MENU characteristic, ACMS displays only the Selection: prompt after the user signs in, without a full default menu. The **/NODISPLAY_MENU** qualifier disables the menu display. The default is taken from the existing definition.

/[NO]FINAL=(*keyword*[,...])

Specifies a task that is run when the user exits from ACMS. The default is taken from the existing definition.

You can specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

  Specifies the application in which the final task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

  Specifies that errors in the final task are ignored. If an error occurs in the final task, ACMS does not display an error message or record information about the error in the audit trail log file.

- **[NO]SELECTION_STRING= "*string*"**

  Specifies a parameter required by the final task. For example, if the final task is an editor, "*string*" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the final task.

/[NO]INITIAL=(*keyword*[,...])

Specifies the task that is run when the user enters the ACMS environment. The default is taken from the existing definition.

You can specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

  Specifies the application in which the initial task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

  Specifies that errors in the initial task are ignored. By default, if an error occurs in an initial task, an error message is displayed on the user's terminal, the reason for the error is recorded in the audit trail log, and the user is signed out of ACMS.

- **[NO]SELECTION_STRING= "*string*"**

Specifies a parameter required by the initial task. For example, if the initial task is an editor, "*string*" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the initial task.

/LANGUAGE[=*language-name*]

Assigns a language to a user in a UDU definition. ACMS matches the language assigned to a user with the language assigned to a DECforms form layout and displays panels in the selected language. The default is taken from the existing definition.

/MDB=*menu-database-file*

Assigns a menu database file to a UDU definition. A menu database file is a file of run-time menu definitions created by the Application Definition Utility (ADU) **BUILD** command. The ACMS run-time system assumes ACMS$DIRECTORY as the default directory and .MDB as the default file type for menu database files in UDU definitions. The default is taken from the existing definition.

/MENU[=*menu-path-name*]

Assigns a menu to a UDU definition. The menu path name is the location of a run-time menu definition in a menu database file. Users cannot see menus whose path names are higher in the menu tree than their default menu path names. Path names for all menus except the highest menu consist of strings of menu keywords. If you do not know the path name to include with the **/MENU** qualifier, you can derive the menu path name from menu keywords, as explained in *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/].

You can define menu entries that contain slashes in the menu definition; however, you cannot specify menu paths containing these slashes in the UDU.

For example, the following format is *not* allowed:

```
UDU> MODIFY SMITH /MENU="TOP/V32.SUBMENU"
```

If you do not specify a menu path name, the user receives the path name defined in the existing definition. If there is no path name defined in the existing definition, a blank path name is assigned. When signing in with a blank path name assigned, the user receives the top menu in the menu database file.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

Use this qualifier to specify a file name or spooled device name for a user. When a form is enabled, ACMS uses the Printfile specification for a device assigned in DDU, if it is available. If it is not, ACMS uses the Printfile specification for the user.

To use the Printfile feature, you must also include a PRINT response step in the DECforms source IDFL file that contains the specifications of the panel that you want to print.

/[NO]SKIPMENULANGUAGE

Use this qualifier with the **/LANGUAGE** qualifier to specify that a language is to be assigned to a user for all DECforms forms except menu forms. For example, with the **/SKIPMENULANGUAGE** qualifier you can specify that DECforms display all panels in French except menu panels.

Notes

To change the $ALL definition, use $ALL as the user name.

The UDU **MODIFY** command does not invoke an editor, unlike the **MODIFY** command of the ACMS Application Definition Utility (ADU).

Examples

1. UDU> **MODIFY CONNOR /MENU=PERSONNEL**

   This command assigns CONNOR the menu path name PERSONNEL, a menu below the highest menu in the menu database file.

2. UDU> **MODIFY CONNOR /MDB=WORKDISK$:[CONNOR]ACMS.MDB**

   This command assigns CONNOR the menu database file ACMS.MDB on WORKDISK$: [CONNOR].

3. UDU> **MODIFY ZEKE /INITIAL=(TASK=NEW_DATA_INFO)**

   This command modifies the definition for ZEKE specifying NEW_DATA_INFO as the new initial task. The name of the application is taken from the existing definition.

4. UDU> **MODIFY WINSTON /PRINTFILE=SPOOLDEV::TXA0:**

   This command modifies the definition for WINSTON specifying SPOOLDEV::TXA0: as the spooled device on which any DECforms print files are to be printed.

REMOVE Command (UDU>)

REMOVE Command (UDU>) — Removes UDU definitions from the user authorization file.

Format

REMOVE *user-name*

Privileges Required

None

Parameters

user-name

The OpenVMS user name in the definition you are deleting. The user name can be $ALL.

Notes

To prevent a user from signing in to ACMS, remove the $ALL definition if the database contains one, or remove the definition for the user.

You cannot delete the DEFAULT definition.

Examples

1. UDU> **REMOVE CONNOR**

   This command deletes the user definition for CONNOR.

2. UDU> **REMOVE $ALL**

   This command deletes the $ALL definition.

REMOVE /PROXY Command (UDU>)

REMOVE /PROXY Command (UDU>) — Removes the specified proxy from the ACMS proxy file (ACMSPROXY.DAT).

Format

REMOVE /PROXY *remote-node::remote-user*

Parameters

remote-node

Specifies a remote node name (1 to 6 alphanumeric characters). Specify an asterisk to remove a proxy that contains an asterisk for the remote node.

remote-user

Specifies the user name of a user at a remote node. A valid remote user name is a string of 1 to 12 alphanumeric characters and can contain underscores and dollar signs. Specify an asterisk to remove a proxy containing an asterisk for the remote user.

Notes

When you remove a proxy, UDU interprets the <remote-node>::<remote-user> and <local-user> parameters as text strings and removes the proxy as specified, including any asterisks. Specifying an asterisk for a parameter removes only a proxy that has an asterisk for that same parameter.

You cannot partially wildcard any parameters with the **REMOVE /PROXY** command. For example, if a user specifies <remote-node>::<remote-user> as COMET::PERS*, UDU returns the error message, "Invalid remote user proxy specification."

If the specified user is not in the file, UDU displays an error message stating that the user does not exist.

Examples

1. UDU> **SHOW /PROXY *::***

```
   Remote User: *::BICKFORD                Local User: BICKFORD
   Remote User: COMET::*                   Local User: RENTAL_AGENT
   Remote User: COMET::BICKFORD            Local User: SUPERVISOR
```

```
Remote User: COMET::PERSONNEL            Local User: PERSONNEL
UDU> REMOVE /PROXY COMET::PERSONNEL
UDU> SHOW /PROXY *::*
Remote User: *::BICKFORD                 Local User: BICKFORD
Remote User: COMET::*                    Local User: RENTAL_AGENT
Remote User: COMET::BICKFORD             Local User: SUPERVISOR
```

In this example, the **REMOVE** command removes the proxy for COMET::PERSONNEL from the ACMS proxy file. This deletion removes the specific ACMS proxy access for user PERSONNEL on node COMET.

2.
```
UDU> SHOW /PROXY *
Remote User: *::BICKFORD                 Local User: BICKFORD
Remote User: COMET::*                    Local User: RENTAL_AGENT
Remote User: COMET::BICKFORD             Local User: SUPERVISOR
UDU> REMOVE /PROXY COMET::*
UDU> SHOW /PROXY *
Remote User: *::BICKFORD                 Local User: BICKFORD
Remote User: COMET::BICKFORD             Local User: SUPERVISOR
```

In this example, the **REMOVE** command removes the proxy for COMET::*. This deletion removes ACMS proxy access for all users on node COMET except for the user name BICKFORD, who has a separate proxy. The proxy for *::BICKFORD is not removed, because the proxy is interpreted as a separate entity.

3.
```
UDU> SHOW /PROXY *
Remote User: *::BICKFORD                 Local User: BICKFORD
Remote User: COMET::BICKFORD             Local User: SUPERVISOR
UDU> REMOVE /PROXY *::BICKFORD
UDU> SHOW /PROXY *
Remote User: COMET::BICKFORD             Local User: SUPERVISOR
```

In this example, the **REMOVE** command removes the proxy for *::BICKFORD. This deletion removes ACMS proxy access for user BICKFORD on every node except COMET::BICKFORD, which is interpreted as a separate entity.

RENAME Command (UDU>)

RENAME Command (UDU>) — Changes the user names and, with qualifiers, other information in UDU definitions.

Format

RENAME *old-user-name new-user-name*

Command Qualifiers	Defaults
/[NO]AGENT	From old definition
/[NO]DISPLAY_MENU	From old definition
/[NO]FINAL=(*keyword*[,...])	From old definition
/[NO]INITIAL=(*keyword*[,...])	From old definition
/LANGUAGE=*language-name*	From old definition

Command Qualifiers	Defaults
/MDB=*menu-database-file*	From old definition
/MENU[=*menu-path-name*]	From old definition
/PRINTFILE [= *print-file-spec* *spooled-device-name*]	From old definition
/[NO]SKIPMENULANGUAGE	From old definition

Privileges Required

None.

Parameters

old-user-name

The OpenVMS user name in the definition you are changing. The old user name can be $ALL.

new-user-name

The OpenVMS user name for the new definition. The new user name can be $ALL.

Qualifiers

/[NO]AGENT

The **/AGENT** qualifier enables an agent to submit a task that has a user name different from the user name of the agent process. You must use the **/AGENT** qualifier to authorize the CP and the QTI as agents. If your system has other agent programs that submit tasks of this type, you must also authorize them with the **/AGENT** qualifier. You must use the **/AGENT** qualifier for any user name that a detached task runs under. Use the **/NOAGENT** qualifier when an agent program no longer submits tasks for processing that run under user names other than the submitting agent program. The default is whatever is defined in the definition you are renaming.

/[NO]DISPLAY_MENU

The **/DISPLAY_MENU** qualifier enables the menu display identified in the user's definition and the Selection: prompt once the user signs in. A menu is identified by a menu path name and a menu database file. If a user's definition has the NODISPLAY_MENU characteristic, ACMS displays only the Selection: prompt after the user signs in, without a full default menu. The **/NODISPLAY_MENU** qualifier disables the menu display. The default is whatever is defined in the definition you are renaming.

/[NO]FINAL=(*keyword*[,...])

Specifies a task that is run when the user exits from ACMS. If you do not specify the **/[NO]FINAL** qualifier, the default is taken from the definition you are renaming.

You can specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

Specifies the application in which the final task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

  Specifies that errors in the final task are ignored. If an error occurs in the final task, ACMS does not display an error message or record information about the error in the audit trail log file.

- **[NO]SELECTION_STRING="*string*"**

  Specifies a parameter required by the final task. For example, if the final task is an editor, "*string*" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the final task.

/[NO]INITIAL=(*keyword*[,...])

Specifies a task that is run when the user enters the ACMS environment. The default is taken from the definition you are renaming.

You can specify one or more of the following keywords. If you specify more than one keyword, you must enclose the keywords in parentheses.

- **APPLICATION=*application-name***

  Specifies the application in which the initial task is run. When you specify the **APPLICATION** keyword, you must also specify a task name with the **TASK** keyword.

- **[NO]IGNORE_ERROR**

  Specifies that errors in the initial task are ignored. By default, if an error occurs in an initial task, an error message is displayed on the user's terminal, the reason for the error is recorded in the audit trail log, and the user is signed out of ACMS.

- **[NO]SELECTION_STRING="*string*"**

  Specifies a parameter required by the initial task. For example, if the initial task is an editor, "*string*" is the file specification of the file to be edited. Enclose the string in quotation marks.

- **TASK=*task-name***

  Specifies the name of the initial task.

/LANGUAGE[=*language-name*]

Assigns a language to a user in a UDU definition. ACMS matches the language assigned to a user with the language assigned to a DECforms form layout and displays panels in the selected language. The default is taken from the definition you are renaming.

/MDB=*menu-database-file*

Assigns a menu database file to a UDU definition. A menu database file is a file of run-time menu definitions created by the ADU **BUILD** command. The ACMS run-time system assumes

ACMS$DIRECTORY as the default directory and .MDB as the default file type for menu database files in UDU definitions. The default is whatever is defined in the definition you are renaming.

/MENU[=*menu-path-name*]

Assigns a menu to a UDU definition. The menu path name is the location of a run-time menu definition in a menu database file. Users cannot see menus whose path names are higher in the menu tree than their default menu path names. Path names for all menus except the highest menu consist of strings of menu keywords. If you do not know the path name to include with the **/MENU** qualifier, you can derive the menu path name from menu keywords, as explained in the *VSI ACMS for OpenVMS ADU Reference Manual* [https://docs.vmssoftware.com/vsi-acms-adu-ref-manual/].

You can define menu entries that contain slashes in the menu definition, however, you cannot specify menu paths containing these slashes in the UDU.

For example, the following format is *not* allowed:

```
UDU> MODIFY SMITH /MENU="TOP/V32.SUBMENU"
```

If you do not specify a menu path name, UDU uses the path name defined in the definition you are renaming. If there is no path name already defined, the user receives a blank path name. When a blank path name is defined, the user receives the top menu in the menu database file when signing in.

/PRINTFILE=*print-file-spec*
/PRINTFILE=*spooled-device-name*

Use this qualifier to specify a file name or spooled device name for a user. When a form is enabled, ACMS uses the Printfile specification for a device assigned in DDU, if it is available. If it is not, ACMS uses the Printfile specification for the user.

To use the Printfile feature, you must also include a PRINT response step in the DECforms source IDFL file that contains the specifications of the panel that you want to print.

/[NO]SKIPMENULANGUAGE

Use this qualifier with the **/LANGUAGE** qualifier to specify that a language is to be assigned to a user for all DECforms forms except menu forms. For example, with the **/SKIPMENULANGUAGE** qualifier you can specify that DECforms display all panels in French except menu panels.

Notes

The new user name must be unique in the user authorization file. You cannot rename the DEFAULT definition.

Examples

1. `UDU> RENAME SMITH JAMISON`

   This command changes the user name from SMITH to JAMISON.

2. `UDU> RENAME SMITH JAMES /MENU=PERSONNEL`

   This command changes the user name from SMITH to JAMES and changes the default menu path name in the definition to PERSONNEL.

SHOW Command (UDU>)

SHOW Command (UDU>) — Displays UDU definitions.

Format

SHOW *user-name*

Command Qualifiers	Defaults
/BRIEF	Full definition

Privileges Required

None.

Parameters

user-name

The OpenVMS user name of the definition you are displaying. Use the wildcard character (*), $ALL, or DEFAULT as the user name. Use the wildcard character to represent a partial user name.

Qualifiers

/BRIEF

Displays only the user names in definitions. The default is to display full definitions.

Notes

To display all definitions, use the wildcard character (*) as the parameter.

Examples

1.
```
UDU> SHOW *

  User Spec:      *
  User Name:      DEFAULT            DISPLAY MENU
  Default Menu:
  Default MDB:    ACMS$DIRECTORY:ACMS.MDB
  Initial Task:
    Application:
    Task:
    Selection:
  Final Task:
    Application:
    Task:
    Selection:
  Language:
  Printfile:

  User Name:      $ALL                DISPLAY MENU
  Default Menu:
```

```
Default MDB:    ACMS$DIRECTORY:ACMS.MDB
Initial Task:
  Application:
  Task:
  Selection:
Final Task:
  Application:
  Task:
  Selection:
Language:
Printfile:
```

The **SHOW** command with the wildcard character (*) displays all definitions in the user authorization file (ACMSUDF.DAT).

2.
```
UDU> SHOW * /BRIEF
User Spec:   *
User Name:   $ALL
User Name:   DEFAULT
User Name:   CONNOR
User Name:   WINSTON
```

The **SHOW/BRIEF** command with the wildcard character (*) displays all user names in UDU definitions.

3.
```
UDU> SHOW CONNOR
User Name:      CONNOR              DISPLAY MENU
Default Menu:   EMPLOYEE
Default MDB:    ACMS$DIRECTORY:ACMS.MDB
Initial Task:                       IGNORE ERROR
  Application:  EMP_ACCT
  Task:         REGISTERY
  Selection:    LOG_IN.DAT
Final Task:                         IGNORE ERROR
  Application:  EMP_ACCT
  Task:         DAILY_LOG
  Selection:    DAYS_WORK.DAT
Language:       ENGLISH
Printfile:      SPOOLDEV::TXA0:
```

The **SHOW** command displays the definition for CONNOR.

SHOW /PROXY Command (UDU>)

SHOW /PROXY Command (UDU>) — Displays one or more proxies in the ACMS proxy file (ACMSPROXY.DAT).

Format

SHOW /PROXY *remote-node::remote-user*

Parameters

remote-node

Specifies a remote node name (1 to 6 alphanumeric characters).

remote-user

Specifies the user name of a user at a remote node. A valid user name is a string of 1 to 12 alphanumeric characters and can contain underscores and dollar signs.

Notes

The **SHOW /PROXY** command interprets the asterisk as a wildcard character. To display the proxy access for all users in the proxy file, specify either a single asterisk (*) or *::* for <remote-user>::<remote-user>. If you use an asterisk for <remote-node>, all user proxies that match the <remote-user> specification are displayed. If you use an asterisk for <remote-user>, all proxies for users on the specified <remote-node> are displayed.

You can also use the wildcard character with the **SHOW /PROXY** command to represent a partial user proxy. You can use the asterisk as a prefix (for example, *FORD), as a suffix (for example, BICK*), or as both (for example, *CKFOR*).

Examples

1.
```
UDU> SHOW /PROXY *::*
Remote User: *::BICKFORD                Local User: BICKFORD
Remote User: COMET::BICKFORD            Local User: SUPERVISOR
Remote User: COMET::BROWN               Local User: BROWN
Remote User: COMET::PERSONNEL           Local User: PERS_USER
Remote User: BRICK::*                   Local User: RENTAL_AGENT
```

   This command displays all proxies in the ACMS proxy file. Note that the command **SHOW /PROXY *** displays the same output.

2.
```
UDU> SHOW /PROXY COMET::PERSONNEL
Remote User: COMET::PERSONNEL           Local User: PERS_USER
```

   This command displays a single proxy.

3.
```
UDU> SHOW /PROXY *::BICKFORD
Remote User: *::BICKFORD                Local User: BICKFORD
Remote User: COMET::BICKFORD            Local User: BICKFORD
```

   This command displays proxies using a wildcard for the remote node.

4.
```
UDU> SHOW /PROXY COMET::*
Remote User: COMET::BICKFORD            Local User: SUPERVISOR
Remote User: COMET::BROWN               Local User: BROWN
Remote User: COMET::PERSONNEL           Local User: PERS_USER
```

   This command displays proxies using a wildcard for the remote user.

5.
```
UDU> SHOW /PROXY COMET::B*
Remote User: COMET::BICKFORD            Local User: SUPERVISOR
Remote User: COMET::BROWN               Local User: BROWN
```

   This command displays proxies using partial wildcarding for the remote user.

Chapter 19. AAU Commands

This chapter contains reference information and examples for the ACMS Application Authorization Utility (AAU) commands. See *Chapter 4, "Authorizing Applications"* for general information on AAU.

ADD Command (AAU>)

ADD Command (AAU>) — Authorizes one or more application names for installation in ACMS$DIRECTORY.

Format

ADD *application-name*

Command Qualifiers	Defaults
/ACL=(*access-control-list*[,...])	From DEFAULT definition
/APPL_USERNAME=*username*	From DEFAULT definition
/[NO]DYNAMIC_USERNAMES	From DEFAULT definition
/SRV_USERNAMES[=(*server-username*[,...])]	From DEFAULT definition
/[NO]WILD_SUFFIX	From DEFAULT definition

Privileges Required

None.

Parameters

application-name

The name of the application you want to authorize. The name can be $ALL or a valid RMS file name of up to 39 characters.

Qualifiers

/ACL=(*access-control-list*[,...])

The **/ACL** qualifier authorizes a user to install an application database file in ACMS$DIRECTORY. When a user enters the **ACMS/INSTALL** command, ACMS checks the AAU authorization to confirm that the Access Control List (ACL) entries used with the **/ACL** qualifier include that user name. If the user is not authorized, the **ACMS/INSTALL** command does not install the application.

The Access Control List identifies who can and who cannot install an application. The access control entries for the AAU follow the same format used for OpenVMS except for these restrictions:

- Only the keyword IDENTIFIER is valid.
- ACE options are not supported.

- Access-allowed-mask uses the ACCESS keyword followed by either the access action CONTROL or NONE.
- Protection masks are not supported.

With these restrictions in mind, the general format for specifying an Access Control List is as follows:

```
/ACL=((IDENTIFIER=identifier[...][,ACCESS=access-action])[,...])
```

For example:

```
AAU> ADD PERSONNEL EMPLOYEE /ACL=(IDENTIFIER=[PAYUP,JONES], -
_AAU> ACCESS=CONTROL)
```

Each time you specify an identifier and optionally an access action code, you describe one access control entry. You can, however, specify a string of access control entries, separated by commas, as indicated by the ellipsis [,...]. Together, access control entries constitute the Access Control List for a particular application.

Refer to *VSI OpenVMS DCL Dictionary: A–M* [https://docs.vmssoftware.com/vsi-openvms-dcl-dictionary-a-m/] for more information about Access Control Lists and entries.

/APPL_USERNAME=*user-name*

Identifies the user name of an application. The **ACMS/INSTALL** command does not install the application database file in ACMS$DIRECTORY unless the application user name in the application matches the one you specify with the **/APPL_USERNAME** qualifier. If you specify the wildcard character (*) instead of a user name, the wildcard user name automatically matches any user name specified in the application the user tries to install.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/APPL_USERNAME=*** when the ACMSAAF.DAT file is first created.

/[NO]DYNAMIC_USERNAMES

Allows a user to install an application database file if the setting you assign with the **/[NO]DYNAMIC_USERNAMES** qualifier matches that in the application. For example, if you do not want an application installed that allows servers to use dynamic user names or "USERNAME OF SUBMITTER", use the **/NODYNAMIC_USERNAMES** qualifier. If you want an application installed that allows servers to use dynamic user names, use the **/DYNAMIC_USERNAMES** qualifier.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns **/NODYNAMIC_USERNAMES** as the default setting when the ACMSAAF.DAT file is first created.

/SRV_USERNAMES[=(*server-user-name*[,...])]

Specifies one or more server user names that are associated with the application you are authorizing. The **ACMS/INSTALL** command installs an application if the server user names that you specify with the **/SRV_USERNAMES** qualifier match those in the application database file. If you specify the wildcard character (*) for a server user name, the wildcard user name automatically matches all server user names specified in the application.

If you do not want to authorize any server user names, include the **/SRV_USERNAMES** qualifier without any specifiers. For example:

```
AAU> ADD INVESTMENT /SRV_USERNAMES
```

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/SRV_USERNAMES=*** when the ACMSAAF.DAT file is first created.

/[NO]WILD_SUFFIX

Allows a user to install or prevents a user from installing any application whose name begins with the letters of the application name you are authorizing. For example, the following command allows the user with UIC [PERSONNEL,RICHARD] to install any application name that starts with the letters INVAPPL:

```
AAU> ADD INVAPPL /ACL=(IDENTIFIER=[PERSONNEL,RICHARD], -
_AAU> ACCESS=CONTROL) /WILD_SUFFIX
```

Once this command is in effect, user [PERSONNEL,RICHARD] can install applications with names such as INVAPPL, INVAPPL1, and INVAPPL2.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/NOWILD_SUFFIX** when the ACMSAAF.DAT file is first created.

Notes

To create an authorization for a single application, use the RMS name of that application as the application name. To create an authorization for all applications, use the keyword $ALL as the application name.

AAU then stores the authorizations you create in the ACMSAAF.DAT file in your default directory. When a user enters the **ACMS/INSTALL** operator command to install an application database file, however, ACMS looks for the ACMSAAF.DAT file in SYS$SYSTEM. If you choose to locate ACMSAAF.DAT in a directory other than SYS$SYSTEM, you must define an EXEC mode logical, ACMSAAF, to point to that directory.

Example

1. `AAU> ADD PERSONNEL`

   This command authorizes the application named PERSONNEL to be installed in ACMS$DIRECTORY. Because the command has no qualifiers, the new authorization receives information from the DEFAULT authorization.

2. `AAU> ADD $ALL`

   This command creates a $ALL authorization that lets any authorized user install any application. The $ALL authorization receives from the DEFAULT authorization any information you do not include with qualifiers.

3. `AAU> ADD EMPLOYEE /APPL_USERNAME=GORDON`

   This command authorizes the application named EMPLOYEE and includes the application user name GORDON. The application database file for EMPLOYEE cannot be installed unless it has the application user name of GORDON. The rest of the information for the authorization comes from the DEFAULT authorization.

COPY Command (AAU>)

COPY Command (AAU>) — Makes a copy of an existing authorization.

Format

COPY *source-application-name new-application-name*

Command Qualifiers	Defaults
/ACL=(*access-control-list*[,...])	From source authorization
/APPL_USERNAME=*username*	From source authorization
/[NO]DYNAMIC_USERNAMES	From source authorization
/SRV_USERNAMES[=(*server-username*[,...])]	From source authorization
/[NO]WILD_SUFFIX	From source authorization

Privileges Required

None.

Parameters

source-application-name

The name of the application whose authorization you want to copy. It can be a valid file name of up to 39 characters, $ALL, or DEFAULT.

new-application-name

The application name you give to the new version of the source authorization. It can be a valid RMS file name or $ALL.

Qualifiers

/ACL=(*access-control-list*[,...])

The **/ACL** qualifier authorizes a user to install an application database file in ACMS$DIRECTORY. The Access Control List identifies who can and who cannot install an application. See the description of the **/ACL** qualifier under the **ADD** command for more information about the **/ACL** qualifier and rules for specifying Access Control Lists.

/APPL_USERNAME=*user-name*

Identifies the user name of an application. The **ACMS/INSTALL** command does not install the application database file in ACMS$DIRECTORY unless the application user name in the application database file matches the one you specify with the **/APPL_USERNAME** qualifier. If you specify the wildcard character (*) instead of a user name, the wildcard user name automatically matches any user name specified in the application that a user tries to install.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/APPL_USERNAME=*** when the ACMSAAF.DAT file is first created.

/[NO]DYNAMIC_USERNAMES

Allows a user to install an application database file if the setting you assign with the **/[NO]DYNAMIC_USERNAMES** qualifier matches that in the application. For example,

if you do not want an application installed that allows servers to use dynamic user names or "USERNAME OF SUBMITTER", use the **/NODYNAMIC_USERNAMES** qualifier. If you want an application installed that allows servers to use dynamic user names, use the **/DYNAMIC_USERNAMES** qualifier.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns **/NODYNAMIC_USERNAMES** as the default setting when the ACMSAAF.DAT file is first created.

/SRV_USERNAMES[=(*server-user-name*[,...])]

Specifies one or more server user names that are associated with the application you are authorizing. The **ACMS/INSTALL** command installs an application if the server user names that you specify with the **/SRV_USERNAMES** qualifier match those in the application database file. If you specify the wildcard character (*) for a server user name, the wildcard user name automatically matches all server user names specified in the application.

If you do not want to authorize any server user names, include the **/SRV_USERNAMES** qualifier without any specifiers. For example:

```
AAU> COPY INVESTMENT /SRV_USERNAMES
```

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/SRV_USERNAMES=*** when the ACMSAAF.DAT file is first created.

/[NO]WILD_SUFFIX

Allows a user to install or prevents a user from installing any application whose name begins with the letters of the application name you are authorizing. For example, the following command allows the user with UIC [PERSONNEL,RICHARD] to copy any application name that starts with the letters INVAPPL:

```
AAU> COPY INVAPPL /ACL=(IDENTIFIER=[PERSONNEL,RICHARD], -
_AAU> ACCESS=CONTROL)/WILD_SUFFIX
```

Once this command is in effect, user [PERSONNEL,RICHARD] can install applications with names such as INVAPPL, INVAPPL1, and INVAPPL2.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/NOWILD_SUFFIX** when the ACMSAAF.DAT file is first created.

Notes

None.

Examples

1. `AAU> COPY PERSONNEL EMPLOYEE`

   This command creates the EMPLOYEE authorization, copying all information from the PERSONNEL authorization.

2. `AAU> COPY PERSONNEL EMPLOYEE /SRV_USERNAMES=EMPLOYEE_SRV`

   This command creates the EMPLOYEE authorization, copying information from the PERSONNEL authorization. The **/SRV_USERNAMES** qualifier assigns the EMPLOYEE_SRV server user name to the EMPLOYEE application authorization.

3. AAU> **COPY PERSONNEL EMPLOYEE /APPL_USERNAME=ACCOUNT**

   This command creates a new authorization with the name EMPLOYEE, copying information from the authorization for PERSONNEL. The **/APPL_USERNAME** qualifier overrides the application user name from the source authorization, so the authorization for EMPLOYEE receives an application user name of ACCOUNT.

4. AAU> **COPY PERSONNEL EMPLOYEE-**
   AAU>_ **/ACL=(IDENTIFIER=[PAYUP,JONES], ACCESS=CONTROL)**

   This command makes a copy of the PERSONNEL authorization and names it EMPLOYEE. The **/ACL** qualifier gives the new EMPLOYEE authorization a new access control entry.

DEFAULT Command (AAU>)

DEFAULT Command (AAU>) — Changes information in the DEFAULT authorization.

Format

DEFAULT

Command Qualifiers	Defaults
/ACL=(*access-control-list*[,...])	From existing authorization
/APPL_USERNAME=*username*	From existing authorization
/[NO]DYNAMIC_USERNAMES	From existing authorization
/SRV_USERNAMES[=(*server-username*[,...])]	From existing authorization
/[NO]WILD_SUFFIX	From existing authorization

Privileges Required

None.

Qualifiers

/ACL=(*access-control-list*[,...])

The **/ACL** qualifier authorizes a user to install an application database file in ACMS$DIRECTORY. The Access Control List identifies who can and who cannot install an application. See the description of the **/ACL** qualifier under the **ADD** command for more information about the **/ACL** qualifier and rules for specifying Access Control Lists.

/APPL_USERNAME=*user-name*

Identifies the default user name of an application in the application authorization file. The **ACMS/INSTALL** command does not install the application database file in ACMS$DIRECTORY unless the application user name in the application database file matches the one you specify with the **/APPL_USERNAME** qualifier, either in the default definition, or through the AAU **ADD** or other commands. If you specify the wildcard character (*) instead of a user name, the wildcard user name automatically matches any user name specified in the application that a user tries to install.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/APPL_USERNAME=*** when the ACMSAAF.DAT file is first created.

/[NO]DYNAMIC_USERNAMES

Allows a user to install an application database file if the setting you assign with the **/[NO]DYNAMIC_USERNAMES** qualifier matches the setting in the application. For example, if you do not want an application installed that allows servers to use dynamic user names or "USERNAME OF SUBMITTER", use the **/NODYNAMIC_USERNAMES** qualifier. If you want an application installed that allows servers to use dynamic user names, use the **/DYNAMIC_USERNAMES** qualifier.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns **/NODYNAMIC_USERNAMES** as the default setting when the ACMSAAF.DAT file is first created.

/SRV_USERNAMES[=(*server-user-name*[,...])]

Specifies one or more server user names that are associated with the default application authorization. The **ACMS/INSTALL** command installs an application using the default server user names unless otherwise specified in the specific application authorization with the **/SRV_USERNAMES**. The server names specified, whether by default or not, must match those in the application database file. If you specify the wildcard character (*) for a server user name, the wildcard user name automatically matches all server user names specified in the application.

If you do not want to authorize any default server user names, include the **/SRV_USERNAMES** qualifier without any specifiers. For example:

```
AAU> DEFAULT/SRV_USERNAMES
```

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/SRV_USERNAMES=*** when the ACMSAAF.DAT file is first created.

/[NO]WILD_SUFFIX

Sets the wildcard attribute for the default authorization record. The **/[NO]WILD_SUFFIX** allows a user to install or prevents a user from installing any application whose name begins with the letters of the application name you are authorizing. For example, the following command allows the user with UIC [PERSONNEL,RICHARD] to install by default any application with wildcards, unless otherwise specified by particular application authorizations.

```
AAU> DEFAULT/ACL=(IDENTIFIER=[PERSONNEL,RICHARD], -
_AAU> ACCESS=CONTROL)WILD_SUFFIX
```

Once this command is in effect, user [PERSONNEL,RICHARD] can install applications with names such as INVAPPL, INVAPPL1, and INVAPPL2.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/NOWILD_SUFFIX** when the ACMSAAF.DAT file is first created.

Notes

The **ADD** command is the only command affected by the DEFAULT authorization. When you use the **ADD** command to create a new authorization, the new authorization takes the default information assigned in the DEFAULT authorization. Use qualifiers with the **ADD** command to override information from the DEFAULT authorization.

When you use the **DEFAULT** command, you do not need to include DEFAULT as the application name.

AAU creates the ACMSAAF.DAT file and a DEFAULT authorization when you first run AAU.

If you omit one or more qualifiers from the **DEFAULT** command, the new DEFAULT authorization retains the information that already exists.

Both the **DEFAULT** and the **MODIFY** commands let you modify the DEFAULT authorization. The **DEFAULT** command, however, lets you change the DEFAULT authorization only. The **MODIFY** command serves a more general use and lets you modify any authorization in the ACMSAAF.DAT database file.

The changes made with the **DEFAULT** command remain in effect until you modify the DEFAULT authorization again. The original settings assigned to the DEFAULT authorization are not restored at the end of the AAU session.

Examples

1. `AAU> DEFAULT /APPL_USERNAME=EMPLOYEE /WILD_SUFFIX`

   This **DEFAULT** command assigns the application user name EMPLOYEE and the wildcard characteristic to the DEFAULT authorization. Any time you add an authorization and do not specify either of these characteristics, the **ADD** command includes the application user name and the wildcard characteristics you have assigned in this DEFAULT authorization to the new authorization.

2. `AAU> DEFAULT/ACL=(IDENTIFIER=[PAYUP,*], ACCESS=CONTROL)`

   This command replaces the previously assigned access control entries with UIC [PAYUP,*], ACCESS=CONTROL.

EXIT Command (AAU>)

EXIT Command (AAU>) — Ends an AAU session and returns you to the DCL prompt.

Format

EXIT

Privileges Required

None.

Note

You can also end an AAU session by pressing **Ctrl/Z**. **Ctrl/Z** signals the end of the file for data entered from the terminal. **Ctrl/Z** is displayed as **EXIT**.

Example

```
AAU> EXIT
$
```

The **EXIT** command stops AAU and returns you to the DCL prompt.

HELP Command (AAU>)

HELP Command (AAU>) — Displays information about AAU commands and qualifiers.

Format

HELP [*topic* [...]]

Command Qualifiers	Defaults
/[NO]PROMPT	/PROMPT

Privileges Required

None.

Parameters

topic

The AAU command or qualifier you want information about. If you do not specify a topic, AAU help provides you with a list of topics to choose from.

Qualifiers

/[NO]PROMPT

Controls whether or not you receive prompts for topics and subtopics. The **/PROMPT** qualifier displays help prompts and is the default. With the **/NOPROMPT** qualifier, the **HELP** command does not display prompts.

Notes

None.

Example

```
AAU> HELP ADD

ADD

   Adds an authorization record to the application authorization
   database file ACMSAAF.DAT. This authorizes one for more users
   to install an application database file in ACMS$DIRECTORY.

   Format:

       ADD application-name [/qualifiers]
```

```
   For example:

       AAU>  ADD PERSONNEL /APPL_USERNAME=FIDDLE

   You can use qualifiers to assign authorization characteristics or
   let new authorizations automatically receive information from the
   DEFAULT authorization.

   To create an authorization for a single application, use the name of
   that application as the application name. To create an authorization
   for all applications, use the keyword $ALL as the application name.


  Additional information available:

  Parameter  Qualifiers

ADD Subtopic?
```

This command displays help information about the **ADD** command.

LIST Command (AAU>)

LIST Command (AAU>) — Writes the contents of an authorization to ACMSAAU.LIS in your default directory or to an output file you specify.

Format

LIST *application-name*

Command Qualifiers	Defaults
/BRIEF	Full authorizations
/OUTPUT[=*file-spec*]	/OUTPUT=ACMSAAU.LIS

Privileges Required

None.

Format

application-name

The name of the application you want to list. The name can be $ALL, DEFAULT, the wildcard character (*), or a valid RMS file name of up to 39 characters. Use the wildcard character (*) as a prefix , as a suffix, or as a combination of prefix and suffix.

Qualifiers

/BRIEF

Lists only the application authorization names. The default is to list the complete authorizations.

/OUTPUT=[*file-spec*]

Copies one or more application authorizations to a file you name. If you do not include a file specification, AAU uses the ACMSAAU.LIS file by default and puts the list file in your current default directory.

Notes

To write all definitions to an output file, use the wildcard character (*) as the user name. To print a listing file, use the DCL **PRINT** command after you have finished your AAU session. To display the contents of an output file on the terminal, use the DCL **TYPE** command.

Examples

1. `AAU> LIST PERSONNEL *`

   This command writes to an output file all information contained in the PERSONNEL authorization.

2. `AAU> LIST * /BRIEF`

   This command writes to an output file a list of all authorized application names only.

3. `AAU> LIST *`

   This command writes all authorizations in the ACMSAAF.DAT authorization database file to the ACMSAAU.LIS file in your default directory.

4. `AAU> LIST B*`

   This command writes the authorizations for all application names beginning with the letter B to an output file.

MODIFY Command (AAU>)

MODIFY Command (AAU>) — Changes information in an application authorization.

Format

MODIFY *application-name*

Command Qualifiers	Defaults
/ACL=(*access-control-list*[,...])	From existing authorization
/APPL_USERNAME=*username*	From existing authorization
/[NO]DYNAMIC_USERNAMES	From existing authorization
/SRV_USERNAMES[=(*server-username*[,...])]	From existing authorization
/[NO]WILD_SUFFIX	From existing authorization

Privileges Required

None.

Format

application-name

The application name for the authorization you are changing. The name can be a valid RMS file name of up to 39 characters, $ALL, or DEFAULT. Use the wildcard character (*) as a prefix, as a suffix , or as both.

Qualifiers

/ACL=(*access-control-list*[,...])

The **/ACL** qualifier authorizes a user to install an application database file in ACMS$DIRECTORY. The Access Control List identifies who can and who cannot install an application. See the description of the **/ACL** qualifier under the **ADD** command for more information about the **/ACL** qualifier and rules for specifying Access Control Lists.

/APPL_USERNAME=*user-name*

Identifies the user name of an application. The **ACMS/INSTALL** command does not install the application database file in ACMS$DIRECTORY unless the application user name in the application database file matches the one you specify with the **/APPL_USERNAME** qualifier. If you specify the wildcard character (*) instead of a user name, the wildcard user name automatically matches any user name specified in the application that a user tries to install.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/APPL_USERNAME=*** when the ACMSAAF.DAT file is first created.

/[NO]DYNAMIC_USERNAMES

Allows a user to install an application database file if the setting you assign with the **/[NO]DYNAMIC_USERNAMES** qualifier matches that in the application. For example, if you do not want an application installed that allows servers to use dynamic user names or "USERNAME OF SUBMITTER", use the **/NODYNAMIC_USERNAMES** qualifier. If you want an application installed that allows servers to use dynamic user names, use the **/DYNAMIC_USERNAMES** qualifier.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns **/NODYNAMIC_USERNAMES** as the default setting when the ACMSAAF.DAT file is first created.

/SRV_USERNAMES[=(*server-user-name*[,...])]

Specifies one or more server user names that are associated with the application you are authorizing. The **ACMS/INSTALL** command installs an application if the server user names that you specify with the **/SRV_USERNAMES** qualifier match those in the application database file. If you specify the wildcard character (*) for a server user name, the wildcard user name automatically matches all server user names specified in the application.

If you do not want to authorize any server user names, include the **/SRV_USERNAMES** qualifier without any specifiers. For example:

```
AAU> MODIFY INVESTMENT /SRV_USERNAMES
```

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/SRV_USERNAMES=*** when the ACMSAAF.DAT file is first created.

/[NO]WILD_SUFFIX

Allows a user to install or prevents a user from installing any application whose name begins with the letters of the application name you are authorizing. For example, the following command allows the user with UIC [PERSONNEL,RICHARD] to install any application name that starts with the letters INVAPPL:

```
AAU> MODIFY INVAPPL /ACL=(IDENTIFIER=[PERSONNEL,RICHARD], -
_AAU> ACCESS=CONTROL)/WILD_SUFFIX
```

Once this command is in effect, user [PERSONNEL,RICHARD] can install applications with names such as INVAPPL, INVAPPL1, and INVAPPL2.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/NOWILD_SUFFIX** when the ACMSAAF.DAT file is first created.

Notes

The AAU **MODIFY** command does not invoke an editor.

Both the **DEFAULT** and the **MODIFY** commands let you modify the DEFAULT authorization. The **DEFAULT** command, however, lets you change the DEFAULT authorization only. The **MODIFY** command serves a more general use and lets you modify any authorization in the ACMSAAF.DAT database file.

Examples

1. `AAU> MODIFY PERSONNEL /APPL_USERNAME=ACCOUNT*`

   This command assigns the application user name ACCOUNT to the PERSONNEL authorization. The new application user name replaces the old one.

2. `AAU> MODIFY EMPLOYEE /SRV_USERNAMES=(TRAINING_SRV)`

   This command replaces the old server user name with TRAINING_SRV.

3. `AAU> MODIFY EMPLOYEE /WILD_SUFFIX`

   This command adds the wildcard characteristic to the EMPLOYEE authorization. Users authorized to install EMPLOYEE can also install any application that begins with the letters EMPLOYEE, such as EMPLOYEE1 or EMPLOYEE2.

REMOVE Command (AAU>)

REMOVE Command (AAU>) — Deletes an authorization from the ACMSAAF.DAT application authorization database file.

Format

REMOVE *application-name*

Privileges Required

None.

Parameter

application-name

The name of the application authorization you are deleting. It can be a valid RMS file name of up to 39 characters or $ALL. It cannot be DEFAULT because AAU does not allow you to delete the DEFAULT authorization.

Notes

None.

Examples

1. `AAU> REMOVE PERSONNEL`

   This command deletes the authorization that has the application name PERSONNEL.

2. `AAU> REMOVE $ALL`

   This command deletes the $ALL authorization. As a result, you may need to create individual authorizations for applications that you want authorized users to install.

RENAME Command (AAU>)

RENAME Command (AAU>) — Gives an application authorization a new name.

Format

RENAME *old-application-name new-application-name*

Command Qualifiers	Defaults
/ACL=(*access-control-list*[,...])	From old authorization
/APPL_USERNAME=*username*	From old authorization
/[NO]DYNAMIC_USERNAMES	From old authorization
/SRV_USERNAMES[=(*server-username*[,...])]	From old authorization
/[NO]WILD_SUFFIX	From old authorization

Privileges Required

None.

Parameters

old-application-name

The application name for the old authorization you are renaming. It can be a valid RMS file name of up to 39 characters or $ALL. It cannot be DEFAULT; AAU does not let you rename the DEFAULT authorization.

new-application-name

The application name you give to the new authorization. The new application name can be a valid RMS file name of up to 39 characters or $ALL.

Qualifiers

/ACL=(*access-control-list*[,...])

The **/ACL** qualifier authorizes a user to install an application database file in ACMS$DIRECTORY. The Access Control List identifies who can and who cannot install an application. See the description of the **/ACL** qualifier under the **ADD** command for more information about the **/ACL** qualifier and rules for specifying Access Control Lists.

/APPL_USERNAME=*user-name*

Identifies the user name of an application. The **ACMS/INSTALL** command does not install the application database file in ACMS$DIRECTORY unless the application user name in the application database file matches the one you specify with the **/APPL_USERNAME** qualifier. If you specify the wildcard character (*) instead of a user name, the wildcard user name automatically matches any user name specified in the application that a user tries to install.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/APPL_USERNAME=*** when the ACMSAAF.DAT file is first created.

/[NO]DYNAMIC_USERNAMES

Allows a user to install an application database file if the setting you assign with the **/[NO]DYNAMIC_USERNAMES** qualifier matches that in the application. For example, if you do not want an application installed that allows servers to use dynamic user names or "USERNAME OF SUBMITTER", use the **/NODYNAMIC_USERNAMES** qualifier. If you want an application installed that allows servers to use dynamic user names, use the **/DYNAMIC_USERNAMES** qualifier.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns **/NODYNAMIC_USERNAMES** as the default setting when the ACMSAAF.DAT file is first created.

/SRV_USERNAMES[=(*server-user-name*[,...])]

Specifies one or more server user names that are associated with the application you are authorizing. The **ACMS/INSTALL** command installs an application if the server user names that you specify with the **/SRV_USERNAMES** qualifier match those in the application database file. If you specify the wildcard character (*) for a server user name, the wildcard user name automatically matches all server user names specified in the application.

If you do not want to authorize any server user names, include the **/SRV_USERNAMES** qualifier without any specifiers. For example:

```
$ AAU> RENAME INVESTMENT /SRV_USERNAMES
```

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/SRV_USERNAMES=*** when the ACMSAAF.DAT file is first created.

/[NO]WILD_SUFFIX

Allows a user to install or prevents a user from installing any application whose name begins with the letters of the application name you are authorizing. For example, the following command allows

the user with UIC [PERSONNEL,RICHARD] to rename any application name that starts with the letters INVAPPL:

```
AAU> RENAME INVAPPL /ACL=(IDENTIFIER=[PERSONNEL,RICHARD], -
_AAU> ACCESS=CONTROL)/WILD_SUFFIX
```

Once this command is in effect, user [PERSONNEL,RICHARD] can rename applications with names such as INVAPPL, INVAPPL1, and INVAPPL2.

By default, AAU uses the setting assigned in the DEFAULT authorization. AAU assigns the default setting **/NOWILD_SUFFIX** when the ACMSAAF.DAT file is first created.

Note

The new application name must be unique in the ACMSAAF.DAT file.

Examples

1.
```
AAU> RENAME PERSONNEL EMPLOYEE /ACL=(ID=[PERSONNEL,RICHARD], -
_AAU> ACCESS=CONTROL)/APPL_USERNAME=MERCHANT /SRV_USERNAMES -
_AAU> =MERCHANT_SRV
```

   This command changes the application name from PERSONNEL to EMPLOYEE. The **/ACL** qualifier replaces the old access control entry with UIC [PERSONNEL,RICHARD]. The **/APPL_USERNAME** qualifier changes the application user name to MERCHANT. Finally, the **SRV_USERNAMES** qualifier replaces any previously assigned server user names with the user name MERCHANT_SRV. The hyphen (-) at the end of a command allows you to continue the command on a new line, and the AAU> prompt shows you when to enter the rest of your command.

2.
```
AAU> RENAME MEDICAL SURGICAL /WILD_SUFFIX
```

   This command changes the application name in the authorization from MEDICAL to SURGICAL. It also gives the wildcard characteristic to the new authorization. Application names with this characteristic allow users to specify with the **ACMS/INSTALL** operator command any application name that begins with the letters of the word SURGICAL. For example, the **ACMS/INSTALL** operator command lets a user install application names, such as SURGICAL1, SURGICALTEAM, or SURGICAL2.

SHOW Command (AAU>)

SHOW Command (AAU>) — Displays information about application authorizations on your terminal screen.

Format

SHOW *application-name*

Command Qualifiers	Defaults
/BRIEF	Displays full authorizations

Privileges Required

None.

Parameters

application-name

The name of an application authorization that you want to display on your terminal screen. The name can be a valid RMS file name of up to 39 characters, $ALL, DEFAULT, or the wildcard character (*). You can also use the wildcard character as a prefix, as a suffix, or as both.

Qualifiers

/BRIEF

Displays only the application names of all authorizations in the ACMSAAF.DAT file. By default, the **SHOW** command displays the contents of all authorizations in ACMSAAF.DAT.

Note

To display the contents of all authorizations in the ACMSAAF.DAT file, use the wildcard character (*) as the application name.

Examples

1. AAU> **SHOW ***

   With the wildcard character (*) as the application name, you can display the contents of all authorizations in the ACMSAAF.DAT file.

2. AAU> **SHOW PERSONNEL***

   You list the contents of the authorization that has the application name PERSONNEL.

3. AAU> **SHOW * /BRIEF**

   The **/BRIEF** qualifier on the **SHOW** command lets you see all the application names in the ACMSAAF.DAT file, without having to list all information associated with each application name.

4. AAU> **SHOW B***

   The **SHOW** command displays authorizations for all application names beginning with the letter B.

Chapter 20. ACMSQUEMGR Commands

This chapter contains reference information and examples for the ACMS Queue Manager (ACMSQUEMGR) Utility commands. ACMSQUEMGR commands allow you to create and manage ACMS task queues and the queued task elements in the queues. See *Chapter 5, "Creating and Managing Queues"* for general information about the ACMSQUEMGR Utility.

CREATE QUEUE Command (ACMSQUEMGR>)

CREATE QUEUE Command (ACMSQUEMGR>) — Creates a queue for queued task elements.

Format

CREATE QUEUE *queue-name*

Command Qualifiers	Defaults
/DEQUEUE=*keyword*	/DEQUEUE=RESUMED
/ENQUEUE=*keyword*	/ENQUEUE=RESUMED
/FILE_SPECIFICATION=*file-spec*	SYS$SYSTEM:<*queue-name*>.DAT
/MAX_WORKSPACES_SIZE=*n*	/MAX_WORKSPACES_SIZE=256

Privileges Required

OpenVMS SYSPRV privilege or write access to SYS$SYSTEM.

Parameters

queue-name

The name of the queue you want to create. A queue name can be any valid RMS file name containing 1 through 39 alphanumeric characters.

Qualifiers

/DEQUEUE=*keyword*

Allows or disallows the dequeuing of all queued task elements in the created queue. Specify one of the following keywords with the **/DEQUEUE** qualifier:

- SUSPENDED

  The **/DEQUEUE=SUSPENDED** qualifier prohibits the Queued Task Initiator (QTI) and ACMS$DEQUEUE_TASK service from processing queued task elements in the queue. This qualifier allows tasks to be queued to the created queue, but suspends them from being dequeued until you specify the **/DEQUEUE=RESUMED** qualifier. The default is **/DEQUEUE=RESUMED**.

- RESUMED

  The **/DEQUEUE=RESUMED** qualifier allows the QTI and ACMS$DEQUEUE_TASK service to dequeue queued task elements in the queue. Use this qualifier after you specify **/DEQUEUE=SUSPENDED** to resume dequeuing. The default is **/DEQUEUE=RESUMED**.

/ENQUEUE=*keyword*

Enables or disables the queuing of queued task elements to the queue you create. You can specify one of the following keywords with the **/ENQUEUE** qualifier:

- SUSPENDED

  The **/ENQUEUE=SUSPENDED** qualifier prohibits the ACMS$QUEUE_TASK service from queuing queued task elements to the queue you create until the queue state is resumed. The default is **/ENQUEUE=RESUMED**.

- RESUMED

  The **/ENQUEUE=RESUMED** qualifier allows ACMS$QUEUE_TASK service to queue queued task elements to the queue you create. The default is **/ENQUEUE=RESUMED**.

/FILE_SPECIFICATION=*file-spec*

Specifies the file specification of the queue repository that stores the queued task elements. The file specification can be any valid RMS file specification or logical name. If you do not specify the **/FILE_SPECIFICATION** qualifier, the queue repository is SYS$SYSTEM: **queue-name**.DAT, where **queue-name** is the name of the created queue. If you do not specify a full file specification, the missing components are taken from the default file specification.

/MAX_WORKSPACES_SIZE=*n*

Specifies the maximum total size (in bytes) of workspaces allowed in a single queued task element for the queue you create. If you do not use the **/MAX_WORKSPACES_SIZE** qualifier, the default is **/MAX_WORKSPACES_SIZE=256**. You can specify a value of 0 through 31,720. If a queued task element's workspace size on a call to the ACMS$QUEUE_TASK service exceeds the value specified with the **/MAX_WORKSPACES_SIZE** qualifier, you receive an error when you queue the task.

Specify the largest workspace size needed for a single queued task element that is queued to the queue. Use the following formula to determine the workspace size for a single queued task element:

```
2 * (n+1)
+ size (in bytes) of workspace 1
+ size (in bytes) of workspace 2
.
.
.
+ size (in bytes) of workspace n (where n is the total number of
 workspaces)
```

The number of workspaces and size of the workspaces that can be passed to a task are displayed when you use the Application Definition Utility (ADU) command **DUMP GROUP**.

For the most efficient performance of the queue services and the QTI, specify the smallest possible value with the **/MAX_WORKSPACES_SIZE** qualifier.

Notes

You must create a queue before the queue can be accessed by the ACMS queued task services or by the QTI run-time component.

The queue repository file is created with the owner UIC [1,4] and the protection (S:RWED,O:RWED,G,W).

ACMS stores queue information in the file SYS$SYSTEM:ACMSQDF.DAT.

Example

1. ACMSQUEMGR> **CREATE QUEUE BIG_NUMBERS_QUE**

   This command creates the queue BIG_NUMBERS_QUEUE. The defaults are used for all qualifiers.

2. ACMSQUEMGR> **CREATE QUEUE EMPLOYEE_QUEUE /MAX_WORKSPACES_SIZE=500**

   This command creates queue EMPLOYEE_QUEUE, setting the maximum workspace size allowed for queued task elements at 500.

3. ACMSQUEMGR> **CREATE QUEUE INVENTORY_QUE -**
   _ACMSQUEMGR> **/FILE_SPECIFICATION=MYDISK$:QUEUE.DAT -**
   _ACMSQUEMGR> **/ENQUEUE=SUSPENDED**

   This command creates the queue INVENTORY_QUE. It names the queue repository file MYDISK$:QUEUE.DAT, and disallows queuing of queued task elements by the ACMS$QUEUE_TASK service.

DELETE ELEMENT Command (ACMSQUEMGR>)

DELETE ELEMENT Command (ACMSQUEMGR>) — Removes one or more queued task elements from the specified queue.

Format

DELETE ELEMENT *element-id queue-name*

Command Qualifiers	Defaults
/[NO]CONFIRM	/NOCONFIRM
/EXCLUDE=(*keyword*[,...])	None
/SELECT=(*keyword*[,...])	None

Privileges Required

Write access to the queue repository file. If the queue repository file has the default protection from the **CREATE QUEUE** command, you need the OpenVMS SYSPRV privilege or the UIC [1,4] to delete the queued task element.

Parameters

element-id

The element identification of the queued task element you want to remove. Either specify the element ID of the task element or use the wildcard character (*). The element ID is returned by the ACMS$QUEUE_TASK service. Specify all or part of the element ID. If you specify only part of an element ID, all queued task elements whose IDs contain the specified characters are removed. For example, if MY_NODE is specified as the element ID, all elements queued from MY_NODE are removed from the queue. Display the element ID of a queued task element by using the **SHOW ELEMENT** command with the **/FULL** qualifier. The **SHOW ELEMENT** command is described in *SHOW ELEMENT Command (ACMSQUEMGR>)*.

If you use the wildcard character (*) in place of an element ID, all queued task elements are removed from the specified queue. When using the wildcard character, you can also use the **/SELECT** qualifier or **/EXCLUDE** qualifier to choose a group of queued task elements to remove.

queue-name

The name of the queue containing the queued task element. A queue name can be any valid RMS file name containing 1 through 39 alphanumeric characters.

Qualifiers

/[NO]CONFIRM

/CONFIRM displays each queued task element selected for removal and prompts you to confirm that you want the queued task element removed. Answer the prompt by entering one of the following:

- **Y** or **y** – For yes
- **N** or **n** – For no
- **Q** or **q** – For quit (exits the command without removing the queued task element).
- **A** or **a** – For always (removes all remaining queued task elements without displaying the confirmation prompt).
- To accept the default option, press **Return**.

The default is **/NOCONFIRM**.

/EXCLUDE=(*keyword*[,...])

Allows you to exclude a queued task element or group of queued task elements from being removed. Specify exclusion criteria with keywords to the **/EXCLUDE** qualifier. You can specify more than one keyword by separating the keywords with a comma and enclosing them in parentheses. You must use at least one keyword with the **/EXCLUDE** qualifier. You can use the **/EXCLUDE** qualifier to limit the scope of the **DELETE ELEMENT** command when you use a wildcard character (*) instead of an element ID.

The **/EXCLUDE** qualifier takes precedence over the **/SELECT** qualifier. Therefore, if a queued task element matches the selection criteria but is excluded by the exclusion criteria, that queued task element is not removed from the queue.

Specify one or more of the following keywords:

- **APPLICATION=(*application-spec*[,...])**

  Excludes queued task elements containing the specified application. Specify more than one application specification by separating the specifications with a comma and enclosing them in parentheses.

- **BEFORE=*time***

  Excludes queued task elements queued before the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **PRIORITY=(*n*[,...])**

  Excludes queued task elements having the specified priority. Valid priority values are 0 through 255. Specify more than one priority value by separating the values with a comma and enclosing them in parentheses.

- **SINCE=*time***

  Excludes queued task elements queued since the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **STATE=[NO]HOLD**

  If you specify **/EXCLUDE=STATE=HOLD**, the ACMSQUEMGR excludes all queued task elements currently on hold. Queued task elements on hold cannot be removed from the queue. If you specify **/EXCLUDE=STATE=NOHOLD**, the ACMSQUEMGR excludes all queued task elements not on hold. Queued task elements that are not on hold can be dequeued.

- **TASK=(*task-name*[,...])**

  Excludes all queued task elements having the specified task name. Specify more than one task name by separating the task names with a comma and enclosing them in parentheses.

- **USERNAME=(*enqueuer-user-name*[,...])**

  Excludes all queued task elements that have the specified enqueuer user name. The enqueuer user name is the user name explicitly or implicitly specified with the ACMS$QUEUE_TASK service. See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for information about the ACMS$QUEUE_TASK service.

/SELECT=(*keyword*[,...])

Limits the **DELETE ELEMENT** command to queued task elements that match the selection criteria. Specify the selection criteria with keywords to the **/SELECT** qualifier. Specify more than one keyword by separating the keywords with a comma and enclosing them in parentheses. You must use at least one keyword with the **/SELECT** qualifier. You can use the **/SELECT** qualifier to limit the scope of the **DELETE ELEMENT** command when you use a wildcard character (*) instead of an element ID.

Specify one or more of the following keywords:

- **APPLICATION=(*application-spec*[,...])**

  Removes only queued task elements containing the specified application. You can specify more than one application specification by separating the specifications with a comma and enclosing them in parentheses.

- **BEFORE=*time***

  Removes all queued task elements queued before the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **PRIORITY=(*n*[,...])**

  Removes all queued task elements having the specified priority. Valid priority values are 0 through 255. Specify more than one priority value by separating the values with a comma and enclosing them in parentheses.

- **SINCE=*time***

  Removes all queued task elements queued since the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **STATE=[NO]HOLD**

  If you specify **/SELECT=STATE=HOLD**, the ACMSQUEMGR removes all queued task elements currently on hold. If you specify **/SELECT=STATE=NOHOLD**, the ACMSQUEMGR removes all queued task elements not on hold.

- **TASK=(*task-name*[,...])**

  Removes all queued task elements having the specified task name. Specify more than one task name by separating the task names with a comma and enclosing them in parentheses.

- **USERNAME=(*enqueuer-user-name*[,...])**

  Removes all queued task elements that have the specified enqueuer user name. The enqueuer user name is the user name explicitly or implicitly specified with the ACMS$QUEUE_TASK service. See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for information about the ACMS$QUEUE_TASK service.

Notes

None.

Examples

1. ACMSQUEMGR> **DELETE ELEMENT MY_NODE::28C0082-0000000A MY_QUE**

   This command deletes the queued task element identified by the element ID MY_NODE::28C0082-0000000A in queue MY_QUE.

2. ACMSQUEMGR> **DELETE ELEMENT * YOUR_QUE**

This command deletes all queued task elements in queue YOUR_QUE.

3. ACMSQUEMGR> **DELETE ELEMENT * RACE_QUEUE /CONFIRM**

   This command causes ACMSQUEMGR to prompt you for confirmation before deleting each queued task element in queue RACE_QUEUE.

4. ACMSQUEMGR> **DELETE ELEMENT * RESERVE_QUE -**
   _ACMSQUEMGR> **/EXCLUDE=TASK=(BIGTSK,BIGGERTSK)**

   This command deletes all queued task elements in queue RESERVE_QUE except for the queued task elements having the names BIGTSK and BIGGERTSK.

5. ACMSQUEMGR> **DELETE ELEMENT MY_NODE:: BOOK_QUE /SELECT=STATE=HOLD**

   This command deletes all queued task elements queued from node MY_NODE to queue BOOK_QUE that are currently on hold.

6. ACMSQUEMGR> **DELETE ELEMENT * BOSCO_QUEUE -**
   _ACMSQUEMGR> **/SELECT=(APPLICATION=STATS,SINCE=TODAY)**

   This command deletes all queued task elements on queue BOSCO_QUEUE that were queued today and contain the application STATS.

DELETE QUEUE Command (ACMSQUEMGR>)

DELETE QUEUE Command (ACMSQUEMGR>) — Deletes the queue you specify.

Format

DELETE QUEUE *queue-name*

Command Qualifiers	Defaults
/[NO]PURGE	/NOPURGE

Privileges Required

Delete access to the queue repository file. If the queue repository file has default protection from the **CREATE QUEUE** command, you need OpenVMS SYSPRV privilege or the UIC [1,4] to delete the queue.

Parameters

queue-name

The name of the queue you want to delete. A queue name can be any valid RMS file name containing 1 through 39 alphanumeric characters.

Qualifiers

/[NO]PURGE

If you use the **/PURGE** qualifier, all queued task elements currently in the queue are deleted along with the queue. If you use the **/NOPURGE** qualifier, and queued task elements are in the queue,

ACMSQUEMGR cannot delete the queue. ACMS displays an error message indicating that the queue is not empty. The default is **/NOPURGE**.

Notes

The **DELETE QUEUE** command requires exclusive access to the queue repository file. If the queue is currently being processed by the QTI, the queue must be stopped with the **ACMS/STOP QUEUE** command. If the queue has been accessed by an image using the ACMS queue task services, the image must be exited.

Examples

1. ACMSQUEMGR> **DELETE QUEUE GROUP_QUE**

   This command deletes queue GROUP_QUE.

2. ACMSQUEMGR> **DELETE QUEUE BOSS_QUE /PURGE**

   This command deletes queue BOSS_QUE and removes any queued task elements in the queue.

EXIT Command (ACMSQUEMGR>)

EXIT Command (ACMSQUEMGR>) — Ends the ACMSQUEMGR session and returns you to DCL level.

Format

EXIT

Privileges Required

None.

Notes

You can also end a session by pressing **Ctrl/Z**. **Ctrl/Z** signals the end of the file for data entered from the terminal. **Ctrl/Z** is displayed as **EXIT**.

Example

```
ACMSQUEMGR> EXIT
$
```

This command causes you to exit from ACMSQUEMGR and returns you to DCL level.

HELP Command (ACMSQUEMGR>)

HELP Command (ACMSQUEMGR>) — Displays information about ACMSQUEMGR commands and qualifiers.

Format

HELP [*topic* [...]]

Command Qualifiers	Defaults
/[NO]PROMPT	/PROMPT

Privileges Required

None.

Parameters

topic

The ACMSQUEMGR command or topic you want to know about. If you do not specify a topic, **HELP** provides a list of topics to choose from. Use the wildcard character (*) as a prefix or suffix to display information on a sequence of topics with common characters.

Qualifiers

/[NO]PROMPT

Controls whether or not you receive prompts for the topic and subtopic. If you use the **/NOPROMPT** qualifier, no prompts are displayed. If you use the **/PROMPT** qualifier, prompts are displayed along with the help information. The default is **/PROMPT**.

Notes

None.

Example

```
ACMSQUEMGR> HELP SET ELEMENT

SET

  ELEMENT

    Sets the state or priority of one or more queued task elements.
    You must specify at least one qualifier or this command has
    no effect.

      Format:

         SET ELEMENT element-id queue-name /qualifier

      You can specify all or part of an element ID. Use the
      wildcard character (*) to set characteristics of all the
      queued task elements in a queue.  Use SHOW ELEMENT to display
      element IDs.

      For example:

         ACMSQUEMGR>  SET ELEMENT * EILEEN_QUE /PRIORITY=200 -
         _ACMSQUEMGR>  /SELECT=(TASK=URGENT)

    Additional information available:
```

```
    /CONFIRM   /EXCLUDE   /PRIORITY  /SELECT    /STATE

SET ELEMENT Subtopic?
```

This command displays help information about the **SET ELEMENT** command.

MODIFY QUEUE Command (ACMSQUEMGR>)

MODIFY QUEUE Command (ACMSQUEMGR>) — With a qualifier, modifies the static characteristics of a task queue.

Format

MODIFY QUEUE *queue-name*

Command Qualifiers	Defaults
/FILE_SPECIFICATION=*file-spec*	Existing queue repository file
/MAX_WORKSPACES_SIZE=*n*	Existing definition specification

Privileges Required

Write access to the queue repository file. If the queue repository file has the default protection from the **CREATE QUEUE** command, you need OpenVMS SYSPRV privilege or the UIC [1,4] to modify the queue.

Parameters

queue-name

The name of the queue whose characteristics you want to modify. A queue name can be any valid RMS file name containing 1 through 39 alphanumeric characters.

Qualifiers

/FILE_SPECIFICATION=*file-spec*

Specifies the file specification of a new queue repository file. The file specification can be any valid RMS file specification or logical name. If you do not use the **/FILE_SPECIFICATION** qualifier, the existing queue repository file is used. If you do not specify a full file specification, the missing components are taken from the default file specification, SYS$SYSTEM:queue-name.DAT, where queue-name is the name of the queue.

/MAX_WORKSPACES_SIZE=*n*

Specifies the maximum total size (in bytes) of workspaces allowed in a single queued task element for the queue you modify. If you do not use the **/MAX_WORKSPACES_SIZE** qualifier, the default is **/MAX_WORKSPACES_SIZE=256**. You can specify a value of 0 through 31,720. If a queued task element's workspace size on a call to the ACMS$QUEUE_TASK service exceeds the value specified with the **/MAX_WORKSPACES_SIZE** qualifier, you receive an error when you queue the task.

Specify the largest workspace size needed for a single queued task element that will be queued to the queue. Use the following formula to determine the workspace size for a single queued task element:

```
2 * (n+1)
+ size (in bytes) of workspace 1
+ size (in bytes) of workspace 2
.
.
.
+ size (in bytes) of workspace n (where n is the total number of
 workspaces)
```

The number of workspaces and size of the workspaces that can be passed to a task are displayed when you use the Application Definition Utility (ADU) command **DUMP GROUP**.

For the most efficient performance of the queue services and the QTI, specify the smallest possible value with the **/MAX_WORKSPACES_SIZE** qualifier.

Notes

You must use either the **/FILE_SPECIFICATION** or **/MAX_WORKSPACES_SIZE** qualifier with the **MODIFY QUEUE** command.

The **MODIFY QUEUE** command requires exclusive access to the queue repository file. If the queue is currently being processed by the QTI, the queue must be stopped with the **ACMS/STOP QUEUE** command before you issue this command. If the queue has been accessed by an image using the ACMS queue task services, the image must be exited.

A queue is not available for any queue operations while it is being modified.

Examples

1. ACMSQUEMGR> **MODIFY QUEUE DEVO_QUE /FILE_SPECIFICATION=DEVO.DAT**

   This command modifies queue DEVO_QUE, naming DEVO.DAT as the queue repository file.

2. ACMSQUEMGR> **MODIFY QUEUE DOCO_QUE /MAX_WORKSPACES_SIZE=500**

   This command modifies queue DOCO_QUE, setting the maximum workspace size of tasks to 500.

SET ELEMENT Command (ACMSQUEMGR>)

SET ELEMENT Command (ACMSQUEMGR>) — With the **/PRIORITY** qualifier, sets the priority of one or more queued task elements. With the **/STATE** qualifier, sets the state of one or more queued task elements.

Format

SET ELEMENT *element-id queue-name*

Command Qualifiers	**Defaults**
/[NO]CONFIRM	/NOCONFIRM
/EXCLUDE=(*keyword*[,...])	None

Command Qualifiers	Defaults
/PRIORITY=*n*	None
/SELECT=(*keyword*[,...])	None
/STATE=[NO]HOLD	None

Privileges Required

Write access to the queue repository file. If the queue repository file has the default protection from the **CREATE QUEUE** command, you need the OpenVMS SYSPRV privilege or the UIC [1,4] to set characteristics.

Parameters

element-id

The element identification of the queued task element whose characteristics you want to set. Either specify an element ID or use the wildcard character (*). The element ID for a task is returned by the ACMS$QUEUE_TASK service.

You can specify all or part of the element ID. If you specify only part of an element ID, the characteristics of all queued task elements whose IDs contain the specified characters are set. For example, if MY_NODE is specified as the element ID, all elements queued from node MY_NODE are set with the characteristics you specify. Display the element ID of a queued task element by using the **SHOW ELEMENT** command with the **/FULL** qualifier. The **SHOW ELEMENT** command is described in *SHOW ELEMENT Command (ACMSQUEMGR>)*.

If you use the wildcard character (*) in place of an element ID, the characteristics of all queued task elements are set. When using the wildcard character, you can also use the **/SELECT** qualifier or the **/EXCLUDE** qualifier to choose a group of queued task elements for which to set characteristics. See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for information about the ACMS$QUEUE_TASK service.

queue-name

The name of the queue that contains the queue task elements. A queue name can be any valid RMS file name containing 1 through 39 alphanumeric characters.

Qualifiers

/[NO]CONFIRM

/CONFIRM displays each queued task element selected for modification and prompts you to confirm that you want the characteristics of the queued task element modified. Answer the prompt by entering one of the following:

- **Y** or **y** – for yes
- **N** or **n** – for no
- **Q** or **q** – for quit (exits the command without modifying the queued task element)
- **A** or **a** – for always (modifies all remaining queued task elements without displaying the confirmation prompt)

- To accept the default option, press **Return**.

The default is **/NOCONFIRM**.

/EXCLUDE=(*keyword*[,...])

Allows you to exclude a queued task element or group of queued task elements from being modified by the **SET ELEMENT** command. Specify the exclusion criteria with keywords to the **/EXCLUDE** qualifier. You must use at least one keyword with the **/EXCLUDE** qualifier. Specify more than one keyword by separating the keywords with a comma and enclosing them in parentheses. You can use the **/EXCLUDE** qualifier to limit the scope of the **SET ELEMENT** command when you specify a wildcard character (*) instead of an element ID.

The **/EXCLUDE** qualifier takes precedence over the **/SELECT** qualifier. Therefore, if a queued task element matches the selection criteria but is excluded by the exclusion criteria, the characteristics of the queued task elements are not modified.

Specify one or more of the following keywords:

- **APPLICATION=(*application-spec*[,...])**

  Excludes queued task elements containing the specified application. Specify more than one application specification by separating the specifications with a comma and enclosing them in parentheses.

- **BEFORE=*time***

  Excludes queued task elements queued before the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **PRIORITY=(*n*[,...])**

  Excludes queued task elements having the specified priority. Valid priority values are 0 through 255. Specify more than one priority value by separating the values with a comma and enclosing them in parentheses.

- **SINCE=*time***

  Excludes queued task elements queued since the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **STATE=[NO]HOLD**

  If you specify **/EXCLUDE=STATE=HOLD**, the ACMSQUEMGR excludes queued task elements that are currently on hold. If you specify **/EXCLUDE=STATE=NOHOLD**, the ACMSQUEMGR excludes queued task elements that are not on hold.

- **TASK=(*task-name*[,...])**

  Excludes all queued task elements having the specified task name. Specify more than one task name by separating the task names with a comma and enclosing them in parentheses.

- **USERNAME=(*enqueuer-user-name*[,...])**

  Excludes all queued task elements that have the specified enqueuer user name. The enqueuer user name is the user name explicitly or implicitly specified with the ACMS$QUEUE_TASK service. See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for information about the ACMS$QUEUE_TASK service.

/PRIORITY=*n*

Specifies the priority of the queued task element. You can specify a priority of 0 through 255. Tasks with the highest numerical priority are processed by the QTI first.

/SELECT=(*keyword*[,...])

Limits the **SET ELEMENT** command to queued task elements that match the selection criteria. Specify the selection criteria with keywords to the **/SELECT** qualifier. Specify more than one keyword by separating the keywords with a comma and enclosing them in parentheses. You must specify at least one keyword with the **/SELECT** qualifier. Use the **/SELECT** qualifier to limit the scope of the **SET ELEMENT** command when you specify a wildcard character (*) instead of an element ID.

You can specify one or more of the following keywords:

- **APPLICATION=(*application-spec*[,...])**

  Sets the characteristics of queued task elements containing the specified application. Specify more than one application specification by separating the specifications with a comma and enclosing them in parentheses.

- **BEFORE=*time***

  Sets the characteristics of queued task elements queued before the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **PRIORITY=(*n*[,...])**

  Sets the characteristics of queued task elements having the specified priority. Valid priority values are 0 through 255. Specify more than one priority value by separating the values with a comma and enclosing them in parentheses.

- **SINCE=*time***

  Sets the characteristics of queued task elements queued since the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **STATE=[NO]HOLD**

  If you use **/SELECT=STATE=HOLD**, the ACMSQUEMGR sets only the characteristics of queued task elements currently on hold. If you use **/SELECT=STATE=NOHOLD**, the ACMSQUEMGR sets only the characteristics of queued task elements that are not on hold.

- **TASK=(*task-name*[,...])**

Sets the characteristics of queued task elements that have the specified task name. Specify more than one task name by separating the task names with a comma and enclosing them in parentheses.

- **USERNAME=(*enqueuer-user-name*[,...])**

  Sets the characteristics of queued task elements that have the specified enqueuer user name. The enqueuer user name is the user name explicitly or implicitly specified with the ACMS$QUEUE_TASK service. See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for information about the ACMS$QUEUE_TASK service.

/STATE=[NO]HOLD

The **/STATE=HOLD** qualifier places the specified queued task element on hold. Queued task elements on hold cannot be dequeued. The **/STATE=NOHOLD** qualifier releases the specified queued task element from the hold state. If you do not include the qualifier, the hold state of the queued task element is unchanged.

Notes

You must use either the **/PRIORITY** qualifier or the **/STATE** qualifier with the **SET ELEMENT** command.

Examples

1. ```
   ACMSQUEMGR> SET ELEMENT MY_NODE:28C00082-0000000E -
   _ACMSQUEMGR> ACCT_QUEUE /PRIORITY=255
   ```

   This command sets the priority of the queued task element having the element ID MY_NODE:28C00082-0000000E to 255. Priority 255 is the highest priority you can assign a task.

2. ```
   ACMSQUEMGR> SET ELEMENT MY_NODE:: FAST_QUEUE -
   _ACMSQUEMGR> /STATE=HOLD/SELECT=APPLICATION=IN_STOCK
   ```

   This command places all queued task elements containing the application IN_STOCK on hold, provided they were queued from node MY_NODE and are stored in queue FAST_QUEUE.

3. ```
   ACMSQUEMGR> SET ELEMENT MY_NODE: PAY_QUE -
   _ACMSQUEMGR> /EXCLUDE=APPLICATION=PAYROLL /STATE=HOLD
   ```

   This command places all queued task elements queued from node MY_NODE in queue PAY_QUE on hold, excluding those queued task elements containing the application PAYROLL.

SET QUEUE Command (ACMSQUEMGR>)

SET QUEUE Command (ACMSQUEMGR>) — With a qualifier, dynamically sets the queue state. The changes to the queue state take effect immediately.

Format

SET QUEUE *queue-name*
   ```

Command Qualifiers	Defaults
/DEQUEUE=*keyword*	Current queue state
/ENQUEUE=*keyword*	Current queue state

Privileges Required

Write access to the queue repository file. If the queue repository file has the default protection from the **CREATE QUEUE** command, you need the OpenVMS SYSPRV privilege or the UIC [1,4] to modify the queue.

Parameters

queue-name

The name of the queue whose state you want to set. A queue name can be any valid RMS file name containing 1 through 39 alphanumeric characters.

Qualifiers

/DEQUEUE=*keyword*

Allows or disallows the dequeuing of all queued task elements in the queue. Specify one of the following keywords with the **/DEQUEUE** qualifier:

- SUSPENDED

  The **/DEQUEUE=SUSPENDED** qualifier prohibits the QTI and ACMS$DEQUEUE_TASK service from dequeuing queued task elements in the queue until the queue state is resumed. The default is whatever is defined in the queue definition file (ACMSQDF.DAT) when the queue was created.

- RESUMED

  The **/DEQUEUE=RESUMED** qualifier allows the QTI and ACMS$DEQUEUE_TASK service to resume dequeuing queued task elements in the queue. The default is whatever is defined in the queue definition file (ACMSQDF.DAT) when the queue was created.

/ENQUEUE=*keyword*

Enables or disables the queuing of queued task elements to a queue. Specify one of the following keywords with the **/ENQUEUE** qualifier:

- SUSPENDED

  The **/ENQUEUE=SUSPENDED** qualifier prohibits the ACMS$QUEUE_TASK service from queuing queued task elements to the queue until the queue is resumed. The default is whatever is currently defined in the queue definition file.

- RESUMED

  The **/ENQUEUE=RESUMED** qualifier allows the ACMS$QUEUE_TASK service to resume queuing queued task elements to the queue. The default is whatever is currently defined in the queue definition file.

Notes

You must use either the **/DEQUEUE** qualifier or the **/ENQUEUE** qualifier with the **SET QUEUE** command. Otherwise, the **SET QUEUE** command has no effect and you receive an error message.

Examples

1. ACMSQUEMGR> **SET QUEUE MILL_QUE /ENQUEUE=SUSPENDED**

   This command prevents the ACMS$QUEUE_TASK service from queuing tasks to queue MILL_QUE.

2. ACMSQUEMGR> **SET QUEUE INVENTORY_QUE /DEQUEUE=SUSPENDED**

   This command prevents the ACMS$DEQUEUE_TASK service and the QTI from dequeuing queued task elements in queue INVENTORY_QUE.

SHOW ELEMENT Command (ACMSQUEMGR>)

SHOW ELEMENT Command (ACMSQUEMGR>) — Displays information about one or more queued task elements in a queue.

Format

SHOW ELEMENT *element-id queue-name*

Command Qualifiers	Defaults
/BRIEF	/BRIEF
/EXCLUDE=(*keyword*[,...])	None
/FULL	/BRIEF
/OUTPUT[=*file-spec*]	/OUTPUT=SYS$OUTPUT
/SELECT=(*keyword*[,...])	None
/TOTAL_ONLY	/BRIEF

Privileges Required

Read access to the queue repository file. If the queue repository file has the default protection from the **CREATE QUEUE** command, you need the OpenVMS SYSPRV privilege or the UIC [1,4] to display information about the queued task element.

Parameters

element-id

The element ID of the queued task element you want to display information about, or the wildcard character (*). If you use the wildcard character, ACMSQUEMGR displays all queued task elements for a queue.

You can specify all or part of the element ID. If you specify only part of an element ID, the ACMSQUEMGR displays all queued task elements whose IDs contain the specified characters. The

element ID for a task is returned by the ACMS$QUEUE_TASK service. Determine the element ID of a queued task element by specifying the **SHOW ELEMENT** command with the **/FULL** qualifier.

When using the wildcard character, you can also use the **/SELECT** qualifier or **/EXCLUDE** qualifier to select a group of queued task elements to display.

queue-name

The name of the queue containing the queued task elements. A queue name can be any valid RMS file name containing 1 through 39 alphanumeric characters.

Qualifiers

/BRIEF

Provides a brief display of queued task information. **/BRIEF** is the default.

/EXCLUDE=(*keyword*[,...])

Allows you to exclude a queued task element or group of queued task elements from being displayed. Specify the exclusion criteria with keywords to the **/EXCLUDE** qualifier. You must use at least one keyword with the **/EXCLUDE** qualifier. Specify more than one keyword by separating the keywords with a comma and enclosing them in parentheses. Use the **/EXCLUDE** qualifier to limit the scope of the **SHOW ELEMENT** command when you use the wildcard character (*) instead of an element ID.

The **/EXCLUDE** qualifier takes precedence over the **/SELECT** qualifier. Therefore, if a queued task element matches the selection criteria but is excluded by the exclusion criteria, that queued task element is not displayed.

Specify one or more of the following keywords:

- **APPLICATION=(*application-spec*[,...])**

  Excludes queued task elements in the specified application from being displayed. Specify more than one application specification by separating the specifications with a comma and enclosing them in parentheses.

- **BEFORE=*time***

  Excludes queued task elements queued before the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **PRIORITY=(*n*[,...])**

  Excludes queued task elements having the specified priority. Valid priority values are 0 through 255. Specify more than one priority value by separating the values with a comma and enclosing them in parentheses.

- **SINCE=*time***

  Excludes queued task elements queued since the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **STATE=[NO]HOLD**

  If you use **/EXCLUDE=STATE=HOLD**, the ACMSQUEMGR excludes queued task elements that are currently on hold. If you use **/EXCLUDE=STATE=NOHOLD**, the ACMSQUEMGR excludes queued task elements that are not on hold.

- **TASK=(*task-name*[,...])**

  Excludes all queued task elements that have the specified task name. Specify more than one task name by separating the task names with a comma and enclosing them in parentheses.

- **USERNAME=(*enqueuer-user-name*[,...])**

  Excludes all queued task elements that have the specified enqueuer user name. The enqueuer user name is the user name explicitly or implicitly specified with the ACMS$QUEUE_TASK service. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for information about the ACMS$QUEUE_TASK service.

/FULL

Provides a full display of queued task element information. If you do not use the **/FULL** qualifier, the ACMSQUEMGR displays only brief information. The default is **/BRIEF**.

/OUTPUT[=*file-spec*]

Specifies a file specification where you want to send the **SHOW** output. Specify a full file specification, including device, directory, file name, and file type. If you specify an incomplete file specification, ACMSQUEMGR uses the file ACMSQUEMGR.LIS as the default output file. If you do not use the **/OUTPUT** qualifier, ACMSQUEMGR sends the output to the default device, SYS$OUTPUT.

/SELECT=(*keyword*[,...])

Limits the **SHOW ELEMENT** command to queued task elements that match the selection criteria. Specify the selection criteria with keywords to the **/SELECT** qualifier. Specify more than one keyword by separating the keywords with a comma and enclosing them in parentheses. You must specify at least one keyword with the **/SELECT** qualifier. Use the **/SELECT** qualifier to limit the scope of the **SHOW ELEMENT** command when you use the wildcard character (*) instead of an element ID.

You can specify one or more of the following keywords:

- **APPLICATION=(*application-spec*[,...])**

  Displays only queued task elements containing the specified application. Specify more than one application specification by separating the specifications with a comma and enclosing them in parentheses.

- **BEFORE=*time***

  Displays only queued task elements queued before the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **PRIORITY=(*n*[,...])**

Displays only queued task elements having the specified priority. Valid priority values are 0 through 255. Specify more than one priority value by separating the values with a comma and enclosing them in parentheses.

- **SINCE=*time***

  Displays queued task elements queued since the specified time. You can specify absolute time, combination time, or the keyword argument TODAY or YESTERDAY. See *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/] for more information about absolute and combination time.

- **STATE=[NO]HOLD**

  If you use **/SELECT=STATE=HOLD**, the ACMSQUEMGR displays only queued task elements currently on hold. If you use **/SELECT=STATE=NOHOLD**, the ACMSQUEMGR displays only queue task elements not on hold.

- **TASK=(*task-name*[,...])**

  Displays all queued task elements having the specified task name. Specify more than one task name by separating the task names with a comma and enclosing them in parentheses.

- **USERNAME=(*enqueuer-user-name*[,...])**

  Displays all queued task elements having the specified enqueuer user name. The enqueuer user name is the user name explicitly or implicitly specified with the ACMS$QUEUE_TASK service. See *VSI ACMS for OpenVMS Writing Applications* [https://docs.vmssoftware.com/vsi-acms-writing-apps/] for information about the ACMS$QUEUE_TASK service.

/TOTAL_ONLY

Displays only the total number of queued task elements that meet the selection criteria specified with the **/SELECT** qualifier.

Notes

The **/BRIEF**, **/FULL**, and **/TOTAL_ONLY** qualifiers are mutually exclusive; you can specify only one of these qualifiers on each **SHOW ELEMENT** command.

Examples

1. ```
   ACMSQUEMGR> SHOW ELEMENT MY_NODE:: PAYROLL_QUEUE /FULL

   ACMS Queued Tasks                    Current Date/Time:  1-MAY-1991
    13:21:31.13

   Task: CHANGE_EMPLOYEE                          State:    HOLD
   Appl: PAYROLL                                  Priority: 5
   Username:   NORTH                              Enq Time:  1-MAY-1991
    10:13:17.71
   Queue Name: PAYROLL_QUEUE
   Element Id: MY_NODE::28C00082-0000000F-FDE272E0-0090AB3F
   Error Cnt:  0
   ```
   ```

```
Task: HIRE_EMPLOYEE                          State:    NOHOLD
Appl: PAYROLL                                Priority: 12
Username:   JONES                            Enq Time:  1-MAY-1991
 10:13:16.85
Queue Name: PAYROLL_QUEUE
Element Id: MY_NODE::28C00082-0000000E-FD5F3920-0090AB3F
Error Cnt:  0
Queued Task total for this display: 2
```

This example displays full information about all queued task elements queued from node MY_NODE:: in queue PAYROLL_QUEUE.

2. ACMSQUEMGR> **SHOW ELEMENT * YAK_QUE -**
   _ACMSQUEMGR> **/BRIEF /SELECT=(SINCE=TODAY,TASK=TASK1)**

   Displays brief information about all queued task elements in queue YAK_QUE that were queued today and that contain task TASK1.

3. ACMSQUEMGR> **SHOW ELEMENT * BANK_QUE /EXCLUDE=STATE=HOLD**

   Displays all queued task elements in queue BANK_QUE that are not currently on hold.

SHOW QUEUE Command (ACMSQUEMGR>)

SHOW QUEUE Command (ACMSQUEMGR>) — Displays the characteristics of the task queue you specify.

Format

SHOW QUEUE *queue-name*

Command Qualifiers	Defaults
/OUTPUT[=*file-spec*]	/OUTPUT=SYS$OUTPUT

Privileges Required

None.

Parameters

queue-name

The name of the queue you want to display information about. A queue name can be any valid RMS file name containing 1 through 39 alphanumeric characters. To display all queues, use the wildcard character (*) in place of a queue name.

Qualifiers

/OUTPUT[=*file-spec*]

Specifies the file specification where you want to send the **SHOW** command output. Specify a full file specification, including device, directory, file name, and file type. If you specify an incomplete

file specification, ACMSQUEMGR uses the file ACMSQUEMGR.LIS. If you do not use the **/OUTPUT** qualifier, ACMSQUEMGR sends the output to the default device, SYS$OUTPUT.

Notes

None.

Examples

1. ACMSQUEMGR> **SHOW QUEUE FASTQUEUE**

   ```
   Queue Name: FASTQUEUE
   Enqueues State: RESUMED  Dequeues State: SUSPENDED Max Wsp Size: 200
   File Specification: DISK1:[FOSTER]SHOW_OUTPUT.LIS;1
   ```

   This command displays queue information for queue FASTQUEUE in your current default directory.

2. ACMSQUEMGR> **SHOW QUEUE SLOWQUEUE /OUTPUT=SLOW_SHOW.LIS**

   This command writes information about queue SLOWQUEUE to the file SLOW_SHOW.LIS.

Chapter 21. Operator Commands

ACMS/CANCEL TASK Command

ACMS/CANCEL TASK Command — Stops one or more task instances. With qualifiers, stops only the task instance you identify.

Format

ACMS/CANCEL TASK [*task-name*]

Command Qualifiers	Defaults
/APPLICATION=*application-name*	All applications
/[NO]CONFIRM	/CONFIRM
/DEVICE=*device-name*	All devices
/IDENTIFIER=*task-id*	All tasks
/[NO]LOG	/NOLOG
/SUBMITTER=*submitter-id*	All submitters
/USER=*user-name*	All user names

Privileges Required

OpenVMS OPER privilege.

Parameters

task-name

The name of the task you want to cancel. It is the name given to the task in the application definition. The task name you specify can exist in more than one application.

Qualifiers

/APPLICATION=*application-name*

Cancels tasks in the specified application only. The application name is the file name of an application database for a started application. Do not include device, directory, or file type with the application name. When you specify the **/APPLICATION** qualifier, ACMS searches for the task name only in the application you specify. If you do not specify the **/APPLICATION** qualifier, ACMS searches for the task name in all active applications on the system.

If you specify an application name with the **/APPLICATION** qualifier, but do not specify a task name, ACMS cancels all currently active tasks for the specified application. Naming an application with the **/APPLICATION** qualifier and naming a task causes ACMS to search for the task in that application only.

/[NO]CONFIRM

The **/CONFIRM** qualifier causes ACMS to display the name of each task to be canceled and prompts you to indicate whether you still want to cancel the task. The **/NOCONFIRM** qualifier tells ACMS not to prompt you to confirm that you want to cancel a task. The default is **/CONFIRM**.

/DEVICE=*device-name*

Cancels tasks with the specified device name only. Device-name is the name of the terminal at which the task is running. You must end the device name with a colon (:). If you do not specify the **/DEVICE** qualifier, ACMS cancels the identified task on all available devices.

/IDENTIFIER=*task-id*

Cancels tasks with the specified task ID only. ACMS assigns a unique task ID to each task and to each task called by another task. If you do not specify the **/IDENTIFIER** qualifier, ACMS does not select tasks by ID to cancel. Refer to *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about specifying a task ID.

/[NO]LOG

The **/LOG** qualifier causes ACMS to display a message indicating that a task has been canceled. The default is **/NOLOG**.

/SUBMITTER=*submitter-id*

Cancels tasks with the specified submitter ID only. ACMS assigns a unique submitter ID to each user who signs in to ACMS. Refer to *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about specifying a submitter ID.

If you do not specify the **/SUBMITTER** qualifier, ACMS does not select tasks by submitter ID to cancel.

/USER=*user-name*

Cancels tasks having the specified user name only. There can be more than one user with the user name you specify. If you do not specify the **/USER** qualifier, ACMS does not select tasks by user name.

Notes

Without any qualifiers, the **ACMS/CANCEL TASK** command cancels all active tasks and prompts you to confirm each cancellation. If you use the **/NOCONFIRM** qualifier, ACMS cancels all task instances without prompting you.

In some situations, you can cancel more than one task instance with a single qualifier. For example, you can use the **/APPLICATION**, **/IDENTIFIER**, **/SUBMITTER**, or **/USER** qualifier to cancel all active instances of a task that have a particular application name, task ID, submitter ID, or user name.

Specifying more than one qualifier limits the scope of the command. For example, specifying the **/APPLICATION=AVERTZ** and **/DEVICE=NL** qualifiers on the same command line causes ACMS to cancel only tasks in the application AVERTZ that have the null device type (NL).

Examples

1. `$ ACMS/CANCEL TASK/NOCONFIRM`

```
Task Name: MON_TASK
  Task ID:          ODE::0001000D-0000001
  Application:      LAS_APPL             User Name:        TUTTLE
  Submitter ID:     ODE::0001000D        Device:           RTA8:
  Called Task:      MON_TASK_A
      Task ID:      ODE::0001000D-0000001-00000002
```

This command cancels each active task on the current node.

2. `$ ACMS/CANCEL TASK/DEVICE=TTH0:`

```
Task Name: DELETE_ALL
  Task ID:       ALLDAY::0001000D-00000001
  Application:   ACCOUNT                User Name:     COUNT
  Submitter ID:  ALLDAY::0001000D       Device:        TTH0:

Task ID:       ALLDAY::0001000D-00000001 (Y/[N]):Y
```

This command displays information about the task active at device TTH0 and prompts you to confirm whether or not to cancel the task. Here, the user canceled the task by typing the letter **Y** (for YES) in response to the `(Y/[N])`. If you do not want ACMS to prompt for confirmation, specify the **/NOCONFIRM** qualifier on the command line.

3. `$ ACMS/CANCEL TASK/NOCONFIRM/USER=ADAMS`

This command cancels all tasks on a node submitted by a user with the user name ADAMS. Because the **/NOCONFIRM** qualifier was specified, ACMS does not prompt for confirmation before canceling the task.

4. `$ ACMS/CANCEL TASK/NOCONFIRM/SUBMITTER=10016`

This command cancels all tasks submitted by a user whose ID is 10016.

5. `$ ACMS/CANCEL TASK/APPLICATION=MARKET`

This command displays all active tasks that are a part of the application MARKET and prompts you to indicate whether or not you want to cancel each task.

6. `$ ACMS/CANCEL TASK/IDENTIFIER=WOW::00050012-00000003`

This command cancels the task with the task ID WOW::00050012-00000003. ACMS also cancels all tasks called by the identified task.

7. `$ ACMS/CANCEL TASK/IDENTIFIER=WOW::00050012-00000003-00000001`

This command cancels the task with the task ID WOW::00050012-00000003-00000001. Three fields in the task ID indicate that this task is a called task.

ACMS/CANCEL USER Command

ACMS/CANCEL USER Command — Cancels a user by stopping all of the user's outstanding tasks and by signing the user out of ACMS.

Format

ACMS/CANCEL USER [*user-name*]

Command Qualifiers	Defaults
/[NO]CONFIRM	/CONFIRM
/DEVICE=*device-name*	All devices
/[NO]LOG	/NOLOG
/SUBMITTER=*submitter-id*	All submitters

Privileges Required

OpenVMS OPER privilege.

Parameters

user-name

The user name of one or more users that you want to cancel. If you include a user name, ACMS cancels the users who are signed in to ACMS under the user name you provide. If you do not include a user name or any qualifiers, ACMS cancels all active users.

Qualifiers

/[NO]CONFIRM

The **/CONFIRM** qualifier causes ACMS to display information about each user selected to be canceled and prompts you to indicate whether or not you still want to cancel the user. The **/NOCONFIRM** qualifier tells ACMS not to prompt you for confirmation. The default is **/CONFIRM**.

/DEVICE=*device-name*

Cancels one or more users identified by device name. Device-name is the name of the terminal at which the user is logged in. You must end the device name with a colon (:). If you do not specify the **/DEVICE** qualifier, ACMS does not cancel users by device name.

/[NO]LOG

Controls whether or not ACMS displays a message after canceling a user. The **/NOLOG** qualifier is the default.

/SUBMITTER=*submitter-id*

Cancels the user identified by the specified submitter ID. ACMS assigns a unique submitter ID to each user who signs in to ACMS. Refer to *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about specifying a submitter ID.

If you do not specify the **/SUBMITTER** qualifier, ACMS does not select users by submitter ID to cancel.

Notes

The **ACMS/CANCEL USER** command also cancels tasks called by other tasks.

The **ACMS/CANCEL USER** command does not affect remote users. You can use only the **ACMS/CANCEL USER** command to cancel users on your current node. Use the **ACMS/CANCEL TASK** command to cancel tasks owned by remote users.

To determine a user name, submitter ID, or device name, specify the **ACMS/SHOW USER** command.

Examples

1. $ **ACMS/CANCEL USER**

```
User Name:        ZEKE          Submitter ID:  BILBO::0001000D
  Agent PID:      22000122      Device:        TTB1:

Submitter ID:     BILBO::0001000D (Y/[N]):N

User Name:        SIMONSAYS     Submitter ID:  BILBO::000200013
  Agent PID:      22000122      Device:        TTH0:_

  Submitter ID:   BILBO::000200013 (Y/[N]):N
```

   This command displays information about all active users on the current node. Because the user responded by typing the letter **N** (for NO) at the confirmation prompt, the users ZEKE and SIMONSAYS are not canceled.

2. $ **ACMS/CANCEL USER ADAMS**

```
User Name:       ADAMS          Submitter ID:       ALLDAY::0001000D
  Agent PID:     00000055       Device ID:          TTH0:

Submitter ID:    ALLDAY::0001000D (Y/[N]):
```

   This command displays information about a user ADAMS and prompts for confirmation before canceling. Type **Y** in response to the confirmation prompt to cancel the user. After you type **Y**, ACMS can display information about another user ADAMS, if there is one.

3. $ **ACMS/CANCEL USER/DEVICE=TTH0:**

```
User Name:         ADAMS          Submitter ID:       ALLDAY::0001000D
  Agent PID:       00000055       Device ID:          TTH0:

Submitter ID:    ALLDAY::0001000D (Y/[N]):
```

   Because the **/CONFIRM** qualifier is the default, this command displays information about the user who is working at the TTH0 device and prompts you to confirm the cancellation. Type **Y** in response to the confirmation prompt to cancel user ADAMS.

4. $ **ACMS/CANCEL USER/SUBMITTER=1000D /LOG**

```
User Name:       ADAMS          Submitter ID: CARAT::0001000D
  Agent PID:     22000122       Device ID:    TTC7:

Submitter ID:    CARAT::0001000D (Y/[N]):Y
%ACMSOPR-I-USERCANED, User ADAMS canceled
```

   This command displays information about the task instance active for a user whose submitter ID is 0001000D, and cancels the user after you type **Y** at the confirmation prompt. The **/LOG** qualifier

prints a message showing you that the cancellation attempt was successful. By default, you do not receive a cancellation message. Refer to *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for a complete description of submitter IDs.

ACMS/DEBUG Command

ACMS/DEBUG Command — Starts the ACMS Task Debugger. This command allows you to test tasks and server procedures without building an entire ACMS application.

Format

ACMS/DEBUG [*task-group name*]

Command Qualifiers	Defaults
/AGENT_HANDLE	None
/PID	None
/SERVER	None
/TWS_POOLSIZE[=*n*]	1600 pagelets (on Alpha and IA-64)
/TWSC_POOLSIZE[=*n*]	50 pagelets (on Alpha and IA-64)
/WORKSPACE	None

Qualifiers

/AGENT_HANDLE

Allows you to submit calls to ACMS tasks from an agent program. The handle name for the agent program must be unique to the system on which you are debugging the task. To ensure that the agent handle is unique to the system, include the PID of the task debugger or the user name of the person doing the debugging in the **/AGENT_HANDLE** name.

/PID

Identifies the process ID (PID) for the server process to be debugged.

/SERVER

Allows you to debug procedure servers as they execute in the ACMS run-time environment. Using this command, you can observe the server process execution through the OpenVMS Debugger, and locate run-time programming or logic errors and other bugs.

/TWS_POOLSIZE

Allows you to specify the sizes of the temporary pools that task workspaces use when a task is started. When you start a task, the group and user workspaces the task uses, as well as system and task workspaces, are copied into temporary workspaces for use by the task. At any given time, the sum of all group, user, system, and task workspaces for all active tasks cannot exceed this number. Valid sizes are from 129 to 65,535 pagelets (Alpha). The default value is 1600 pagelets (Alpha and IA-64).

/TWSC_POOLSIZE

Controls the overall size of the pool used to store information needed to allocate the task instance workspaces stored in the TWS_POOLSIZE pool. Valid sizes are from 9 to 63 pagelets (Alpha). The default value is 50 pagelets (Alpha and IA-64).

/WORKSPACE

Allows the examination of workspaces during exchange steps, the action part of processing steps, or at the beginning or end of a task. If it is not specified, workspaces can be examined only when a task is running a server.

Privileges Required

None.

Notes

If you specify a value between 0 and 129 for **/TWS_POOLSIZE**, or a value for TWSC_POOLSIZE that is between 0 and 9, ACMS overrides the value and sets them to the minimum required values (129 or 9, respectively). Then before starting the task debugger, ACMS notifies the user that the change has been made. If you specify a value less than 0 for either pool size, ACMS returns an error message.

If you invoke **ACMS/DEBUG/SERVER** using the process name for a server process that has a UIC group number different from the invoking user's process UIC group number, you receive the following error:

```
%ACMSOPR-E-DBGSERERR, Error during DEBUG/SERVER
-ACMSOPS-W-NOSUCHSER, Specified server does not exist
%ACMSOPR-E-ERROR, Some operations may not have been performed
```

To correct this problem, use the process PID to access the server process.

Examples

1. `$ ACMS/DEBUG VR_TASK_GROUP/WORKSPACE`

   This command instructs the ACMS Task Debugger to debug tasks in the task group database file VR_TASK_GROUP. The command also allows you to examine and deposit data in workspaces.

2. `$ ACMS/DEBUG/SERVER ACMS000SP001000`

   This command starts the debugger for the server process name ACMS000SP001000.

3. `$ ACMS/DEBUG/TWSC_POOLSIZE=30/TWS_POOLSIZE=500 VR_TASK_GROUP`

   This command instructs the ACMS Task Debugger to debug tasks in the task group database file VR_TASK_GROUP. In addition, the command overrides the default values of TWSC_POOLSIZE and TWS_POOLSIZE for this session.

ACMS/ENTER Command

ACMS/ENTER Command — Allows a terminal that has logged in to OpenVMS to use the ACMS menu system.

Format

ACMS/ENTER

Command Qualifiers	Defaults
/[NO]RETURN	/RETURN

Privileges Required

None.

Qualifiers

/[NO]RETURN

If you specify the **/RETURN** qualifier, your DCL process waits until you exit from ACMS. When you exit from ACMS, you are returned to your DCL process.

If you specify the **/NORETURN** qualifier, your DCL process is deleted once you enter the ACMS menu system. Once you exit from ACMS, you are logged out. The default is **/RETURN**.

Notes

Both the ACMS system and the Terminal Subsystem Controller (TSC) must be started before a user can enter the ACMS menu system.

Your terminal must be authorized in the ACMS device definition file for you to enter the ACMS menu system. See *Chapter 2, "Authorizing and Controlling Terminals"* for information on authorizing devices with the Device Definition Utility (DDU).

You cannot issue an **ACMS/ENTER** command from a DCL server unless the task was selected from a user-written agent. Doing so can cause parts of the Terminal Subsystem Controller (TSC) to fail and can sign other users out of ACMS. Components within the ACMS terminal subsystem maintain databases based on terminal names. When you issue a second **ACMS/ENTER** command, various errors can occur in the ACMS Command Process (CP) and TSC, including process termination.

Examples

1. $ **ACMS/ENTER**

   This command places you in the ACMS menu system. When you exit from ACMS, you are returned to DCL command level.

2. $ **ACMS/ENTER/NORETURN**

   This command places you in the ACMS menu system. When you exit from ACMS, you are logged out.

ACMS/INSTALL Command

ACMS/INSTALL Command — Installs an application in ACMS$DIRECTORY or removes an application database file from ACMS$DIRECTORY.

Format

ACMS/INSTALL *file-spec*

Command Qualifiers	Defaults
/[NO]REMOVE	/NOREMOVE

Privileges Required

Application Authorization Utility (AAU) authorization.

Parameters

file-spec

The file specification of an application database file to be moved to or removed from ACMS$DIRECTORY. The application database file must have a file type of .ADB.

If the file is to be moved into ACMS$DIRECTORY, the file specification can be any valid RMS file specification or logical name. If it is a logical name that is a search list, only the first translation in the search list is used. When you omit the device and directory, ACMS looks for the application database file in your default directory. The default file type is .ADB.

If the file is to be removed from ACMS$DIRECTORY, specify the **/REMOVE** qualifier and the file name of the application. Do not specify a node, device, directory, or file type, or you receive an error.

Qualifiers

/[NO]REMOVE

The **/REMOVE** qualifier indicates that you want to delete the specified application from ACMS$DIRECTORY. The default is **/NOREMOVE**.

Notes

You can install or delete only one application database file at a time. ACMS displays a message telling you when an application database file is successfully installed.

You do not need to install applications every time you start your ACMS system. This differs from the way you use OpenVMS **INSTALL** and some other ACMS operator commands.

The **ACMS/INSTALL** command does not support search lists.

Examples

1.
```
$ ACMS/INSTALL APPL$:EMPLAPP.ADB
Application Database File APPL$:EMPLAPP.ADB Installed -
in ACMS$DIRECTORY
```

   This command searches for the file EMPLAPP.ADB on the disk and directory identified by the logical name APPL$, checks the application database file against the application authorization in the ACMSAAF.DAT file, and installs the application database file in ACMS$DIRECTORY. ACMS displays a message when it has successfully installed the application database file.

2. `$ ACMS/INSTALL EMPLAPP /REMOVE`
   `Application Database File EMPLAPP Removed from ACMS$DIRECTORY`

   Because it includes the **/REMOVE** qualifier, this command deletes the application database file EMPLAPP from ACMS$DIRECTORY. Only the application file name is specified. ACMS displays a message when it has successfully deleted the application database file.

3. `$ ACMS/INSTALL EMPLAPP.ADB`
   `Application Database File APPL$:EMPLAPP.ADB Installed -`
   `in ACMS$DIRECTORY`

   Because this command does not include a device or directory with the file specification, the **ACMS/INSTALL** command searches your default directory. ACMS displays a message when it has successfully located and installed the application database file.

ACMS/MODIFY APPLICATION Command

ACMS/MODIFY APPLICATION Command — Modifies the attributes of an active application.

Format

ACMS/MODIFY APPLICATION [*application-name*[,...]]

Command Qualifiers	Defaults
/APPLICATION_ATTRIBUTES=(*attribute*[,...])	None
/[NO]CONFIRM	/CONFIRM
/[NO]LOG	/NOLOG
/SERVER_ATTRIBUTES=(*attribute*[,...])	None
/TASK_ATTRIBUTES=(*attribute*[,...])	None

Privileges Required

OpenVMS OPER privilege.

Parameters

application-name

The name of the active application that you want to modify. If you do not supply an application name, all applications are modified with the attributes you specify. You can specify more than one application name by separating each name with a comma (,).

Qualifiers

/APPLICATION_ATTRIBUTES=(*attribute*[,...])

Modifies an attribute of the active application. The attribute argument specifies the attribute you want to modify. Specify more than one attribute by separating the attributes with a comma (,) and enclosing them in parentheses.

You can specify one or more of the following attributes:

- [NO]AUDIT

  Enables or disables application level auditing within the specified application.

- MAX_INSTANCE=n

  Specifies the maximum number of tasks that can execute simultaneously within the specified application. You can specify an integer from 0 through 65535.

- MAX_PROCESS=n

  Specifies the maximum number of server processes that can be active simultaneously within the specified application. You can specify an integer from 0 through 65535.

- MONITOR_INTERVAL=n

  Specifies the server process monitoring interval. The server process monitoring interval is the interval at which ACMS checks servers to see if new processes are needed, or extra processes need to be deleted. You can specify 0 through 65535 seconds

/[NO]CONFIRM

This qualifier determines whether or not ACMS displays each application selected for modification and prompts you for confirmation before making the modifications. The default is **/CONFIRM**.

/[NO]LOG

This qualifier determines whether or not ACMS displays information level status messages generated by the modify request. The default is **/NOLOG**.

/SERVER_ATTRIBUTES=(*attribute*[,...])

Modifies an attribute of a server in the specified application. The attribute argument specifies the attribute you want to modify. Specify more than one attribute by separating the attributes with a comma (,) and enclosing them in parentheses.

The **/SERVER_ATTRIBUTES** qualifier is a repeating qualifier. This means that you can specify the **/SERVER_ATTRIBUTES** qualifier more than once on the same command.

You can specify one or more of the following attributes:

- NAME=(*server-name*[,...])

  Identifies the server to be modified in the specified application. If you specify the **/SERVER_ATTRIBUTES** qualifier but do not specify the NAME attribute, ACMS modifies all servers in the selected application. Specify more than one server name by separating the server names with a comma (,) and enclosing them in parentheses.

- [NO]AUDIT

  Enables or disables server-level auditing within the specified application.

- CREATION=DELAY=*n*

  @@@@@@@@@@=INTERVAL=n

  @@@@@@@@@@=(DELAY=*n*,INTERVAL=*n*)

Adjusts the creation delay time, the creation interval time, or both. Creation delay time is the amount of time ACMS waits for busy servers to become free before creating a new server to handle a demand. Once ACMS creates a new server, creation interval is the amount of time ACMS waits before creating another new server. You can specify 0 through 65535 seconds.

- DELETION=DELAY=*n*

  @@@@@@@@@@=INTERVAL=*n*

  @@@@@@@@@@=(DELAY=*n*,INTERVAL=*n*)

  Adjusts the deletion delay time, the deletion interval time, or both. Deletion delay time is the amount of time ACMS allows a server to be free before deleting a server. Deletion interval is the amount of time ACMS waits after deleting one free server before deleting another. You can specify 0 through 65535 seconds.

- [NO]PROCESS_DUMPS

  PROCESS_DUMPS dynamically enables server process dumping for servers within the specified application. NOPROCESS_DUMPS disables server process dumping.

- MAX_PROCESS=*n*

  Specifies the maximum number of server processes allowed for the specified server. You can specify an integer from 0 through 65535.

- MIN_PROCESS=*n*

  Specifies the minimum number of server processes required for the specified server. You can specify an integer from 0 through 65535.

/TASK_ATTRIBUTES=(*attribute*[,...])

Modifies the attributes of the specified task. The attribute argument specifies the attribute you want to modify. Specify more than one attribute by separating the attributes with a comma (,) and enclosing them in parentheses.

The **/TASK_ATTRIBUTES** qualifier is a repeating qualifier. This means you can specify the **/TASK_ATTRIBUTES** qualifier more than once on the same command.

You can specify one or more of the following attributes:

- NAME=(*task-name*[**,**...])

  Specifies the name of a task within the specified application whose attributes you want to modify. If you do not specify the NAME attribute, all tasks are modified within the selected application with whatever attributes you specify.

- [NO]AUDIT

  Enables or disables task-level auditing within the specified application.

- ENABLE

  Enables specific tasks within the specified application.

- DISABLE

  Disables specific tasks within the specified application.

- TRANSACTION_TIMEOUT=(*seconds*)

  Specifies a transaction timeout value for a task or tasks in the specified application.

- NOTRANSACTION_TIMEOUT

  Specifies that there be no transaction timeout value for a task or tasks in the specified application.

Notes

When you specify the **ACMS/MODIFY APPLICATION** command, parameters are only modified within the current active application. If the application is stopped and restarted, the parameters are reset to the values specified in the application definition. If you want a modification to be permanent, you must modify the application definition.

Examples

1. ```
   $ ACMS/MODIFY APPLICATION TEST /APPLICATION_ATTRIBUTES=(NOAUDIT, -
   _$ MAX_INSTANCE=3)
   Apply Modifications to Application TEST (Y/[N]):
   ```

   This command disables audit trail logging for the application and allows a maximum of three tasks to execute within the TEST application at any given time. ACMS displays the confirmation prompt before executing this command.

2. ```
   $ ACMS/MODIFY APPLICATION DATADAT -
   _$ /SERVER_ATTRIBUTES=(NAME=(SERVER_1880,SERVER_1776), -
   _$ MAX_PROCESS=5,MIN_PROCESS=1) -
   _$ /SERVER_ATTRIBUTES=(NAME=SERVER_ODCE, -
   _$ MAX_PROCESS=10,MIN_PROCESS=3)
   Apply Modifications to Application DATADAT (Y/[N]):
   ```

   This command modifies the application DATADAT, setting the maximum processes allowed for servers SERVER_1880 and SERVER_1776 to 5 and the minimum processes required to 1. This command also modifies the attributes of server SERVER_ODCE, setting the maximum processes allowed to 10 and the minimum processes required to 3. Because **/CONFIRM** is the default, ACMS prompts you before executing this command.

3. ```
   $  ACMS/MODIFY APPLICATION POST_REQ -
   _$ /SERVER_ATTRIBUTES=(NAME=SERVER_10,CREATION= -
   _$ (DELAY=10,INTERVAL=30))-
   _$ /NOCONFIRM
   ```

   This command modifies application POST_REQ, causing ACMS to wait 10 seconds for an instance of SERVER_10 to become free before creating a new server process. Once a new server is created, ACMS must wait 30 seconds before creating another new server.

4. ```
   $  ACMS/MODIFY APPLICATION NEWAPPL -
   _$  /TASK_ATTRIBUTES=(NAME=(DTSK,FTSK),DISABLE) -
   _$  /TASK_ATTRIBUTES=(NAME=NEWTSK,ENABLE) /NOCONFIRM
   ```

This command modifies the application NEWAPPL, disabling the tasks DTSK and FTSK and enabling the task NEWTSK.

ACMS/REPLACE SERVER Command

ACMS/REPLACE SERVER Command — Replaces a server image with a new version of that image. All subsequent tasks use the new image.

Format

ACMS/REPLACE SERVER [*server-name*[,...]]

Command Qualifiers	Defaults
/APPLICATION=*application-name*	All applications
/[NO]CONFIRM	/CONFIRM
/[NO]LOG	/NOLOG

Privileges Required

OpenVMS OPER privilege.

Parameters

server-name

The name of the server you want to replace. The server name is defined in the application definition. If you do not specify a server name, ACMS replaces all servers.

Qualifiers

/APPLICATION=*application-name*

Causes ACMS to replace server images only in the application you specify. Specify the application file name only; do not include node, device, or directory.

When you specify an application name with the **/APPLICATION** qualifier, ACMS searches for the server name in the application you specify. If you specify the **/APPLICATION** qualifier but do not specify a server name, ACMS searches for all servers in the application. If you do not specify the **/APPLICATION** qualifier, ACMS searches for the server name in all applications on the node.

/[NO]CONFIRM

The **/CONFIRM** qualifier causes ACMS to display each server selected for replacement and prompt you to indicate whether or not you want to replace the server. The **/NOCONFIRM** qualifier causes ACMS not to prompt you for confirmation. The default is **/CONFIRM**.

/[NO]LOG

Controls whether or not ACMS displays a message after replacing a server. The **/NOLOG** qualifier is the default.

Notes

When the application controller receives the **ACMS/REPLACE SERVER** command, it runs down all free server processes for the specified server and requests all active servers to run down when they are free. A server retaining context does not run down until the context has been released. New server processes are created to meet the minimum and maximum server process requirements of the application. If a server image is active or still executing, ACMS replaces it with the new version once it stops executing or is aborted.

If a server image does not stop because of an infinite loop, use the command **ACMS/SHOW SERVER** to determine the server process ID. To stop the server process, use one of the following:

- Use the DCL command **STOP/ID** to cancel the server process. However, **STOP/ID** may have adverse effects on the application. For example, if ACMS is using Rdb, **STOP/ID** cancels the server process without the database recovery associated with normal rundown.
- Use the OpenVMS FORCEX system service. This allows normal recovery of data. However, you must write a small program to use FORCEX.
- Use the **ACMS/CANCEL TASK** command to cancel the task that the server is running.
- Use the **ACMS/STOP APPLICATION/CANCEL** command. However, this command stops all occurrences of all servers in the application.

You cannot replace a DCL server because the image executed is supplied by VSI It is not customer modifiable.

See *Chapter 9, "Installing and Managing Applications"* for more information about this command.

If you use the **ACMS/REPLACE SERVER** command to replace a server when an application is not fully started, then EXC logs the following error message in SWL:

```
%ACMSI-E-BADSTATE, Internal Error: invalid state 00000006
```

Examples

1. `$ ACMS/REPLACE SERVER MYSERV/NOCONFIRM`

   This command replaces the server image for the server MYSERV with a new version of that image in all applications.

2. `$ ACMS/REPLACE SERVER MYSERV/APPLICATION=TESTALL/NOCONFIRM`

   This command replaces the server image for the server MYSERV in the application TESTALL with a new version of that image.

ACMS/REPROCESS APPLICATION_SPEC Command

ACMS/REPROCESS APPLICATION_SPEC Command — Causes ACMS to retranslate the application specification for an application and redirect all subsequent task selections to the application pointed to by the application specification.

Format

ACMS/REPROCESS APPLICATION_SPEC *application-spec*

Command Qualifiers	Defaults
/[NO]CONFIRM	/CONFIRM
/[NO]LOG	/NOLOG

Privileges Required

OpenVMS OPER privilege.

Parameters

application-spec

The application specification for an application. It can be a logical name or a search list of application database files. If the application specification is a search list, the first available application in the search list is used.

The search list can contain an application that resides on a remote node. If the file resides on a remote node, you must specify the remote node name in the search list. The following is an example of a search list defined as the logical name PAYROLL:

```
$ DEFINE/SYSTEM PAYROLL BIGAPPL::PAYROLL, FASTAPPL::PAYROLL, -
_$ BACKUP::PAYROLL
```

You cannot specify access control strings in an application specification. See *Chapter 6, "Using Distributed Forms Processing"* for more information on application specifications.

Qualifiers

/[NO]CONFIRM

The **/CONFIRM** qualifier causes ACMS to prompt you for confirmation before reprocessing the application specification. The **/NOCONFIRM** qualifier causes ACMS not to prompt you for confirmation before performing the reprocess. The default is **/CONFIRM**.

/[NO]LOG

Controls whether or not ACMS displays a message after translating the application specification. The **/NOLOG** qualifier is the default.

Notes

The **ACMS/REPROCESS APPLICATION_SPEC** command can be used to failover to applications. If a search list is used for an application specification, automatic failover occurs in the event of a system failure. Use the **ACMS/REPROCESS APPLICATION_SPEC** command to failover to the original application when it becomes available.

The **ACMS/REPROCESS APPLICATION_SPEC** command is not supported if, on a single submitter node, you have two application specification logical names that point to two differently ordered search lists containing the same application names.

Example

```
$ ACMS/REPROCESS APPLICATION_SPEC PAYROLL
```

This example causes ACMS to retranslate the search list for the logical name PAYROLL. ACMS uses the first available application in the search list.

ACMS/RESET AUDIT Command

ACMS/RESET AUDIT Command — Resets the ACMS Audit Trail Logger, causing the ACMS audit trail log file to be closed and a new log file to be opened.

Format

ACMS/RESET AUDIT

Privileges Required

OpenVMS OPER privilege.

Notes

If the Audit Trail Logger process has stopped, the **ACMS/RESET AUDIT** command restarts the process.

Starting ACMS creates a new version of the audit trail log file.

The logical name ACMS$AUDIT_LOG points to the ACMS audit trail log file. ACMS$AUDIT_LOG is defined during system startup with auditing enabled and when audit trail logging is enabled with the **ACMS/SET SYSTEM /AUDIT** command.

If the logical name ACMS$AUDIT_LOG is already defined when you execute the **ACMS/RESET AUDIT** command, ACMS creates a new version of the file using its equivalence name string. If the logical ACMS$AUDIT_LOG is not defined, ACMS creates the file SYS$ERRORLOG:ACMSAUDIT.LOG. For more information about the Audit Trail Logger and the audit trail log file, see *Chapter 12, "Auditing Applications with the Audit Trail Logger"*.

Example

```
$ ACMS/RESET AUDIT
```

This command creates a new version of the Audit Trail Logger.

ACMS/RESET TERMINALS Command

ACMS/RESET TERMINALS Command — Causes ACMS to read the DDU database file and authorize any new controlled terminals as well as release any terminals that are no longer authorized.

Format

ACMS/RESET TERMINALS

Privileges Required

OpenVMS OPER privilege

Notes

The TSC must be started before you can use the **ACMS/RESET TERMINALS** command. The **ACMS/RESET TERMINALS** command only affects terminals controlled by the TSC. No current terminal user is affected.

If you assign the AUTOLOGIN or CONTROLLED sign-in characteristics to a terminal, ACMS reads the new characteristic only when you:

- Issue the **ACMS/RESET TERMINALS** command
- Issue an **ACMS/START TERMINALS** command or an **ACMS/START SYSTEM** command that starts the TSC

If a terminal that was previously assigned the NOT CONTROLLED characteristic is assigned the CONTROLLED characteristic, ACMS checks to see if that terminal is currently using the ACMS menu interface. If it is, ACMS designates the terminal as controlled so it is not released when the user signs out. If the terminal is not using the ACMS menu interface, the TSC allocates that terminal.

Conversely, if a terminal that was previously assigned the CONTROLLED characteristic is now assigned the NOT CONTROLLED characteristic, ACMS checks to see if that terminal is currently using the ACMS menu interface. If it is, ACMS designates the terminal as not controlled and releases the terminal when the user signs out. If the terminal is not using the ACMS menu interface, the TSC deallocates that terminal. Once deallocated, the terminal can be used to sign in normally.

For more information about sign-in characteristics for terminals, see *Chapter 2, "Authorizing and Controlling Terminals"*.

Example

```
$
ACMS/RESET TERMINALS
```

This command makes available to ACMS any terminals recently assigned the CONTROLLED characteristic. Terminals defined with the CONTROLLED characteristic sign directly in to ACMS when users type an OpenVMS login sequence.

ACMS/SET QUEUE Command

ACMS/SET QUEUE Command — Sets the processing characteristics of a started task queue. The processing characteristics are used by the Queued Task Initiator (QTI).

Format

ACMS/SET QUEUE *queue-name*[,...]

Command Qualifiers	Defaults
/TASK_THREADS=*n*	/TASK_THREADS=1

Privileges Required

OpenVMS OPER privilege.

Parameters

queue-name

The name of the queue for which you want to set processing characteristics.

Qualifiers

/TASK_THREADS=*n*

Specifies the number of concurrent outstanding tasks that the QTI processes for the specified queue. Here, n indicates a value from 1 through 255. Normally, a relatively low number (1 through 5) is sufficient to achieve maximum throughput of the queue.

The **/TASK_THREADS** qualifier is a positional qualifier. If you position the **/TASK_THREADS** qualifier between the **ACMS/SET QUEUE** command and the queue names, all queue names are affected. To have the **/TASK_THREADS** qualifier apply to an individual queue name in a list of queue names, place the qualifier directly after the queue name. See the examples section for examples of using this qualifier. The default is **/TASK_THREADS=1**.

Notes

None.

Examples

1. $ **ACMS/SET QUEUE NEWQ**

   This command sets to one the maximum number of concurrent outstanding tasks for queue NEWQ.

2. $ **ACMS/SET/TASK_THREADS=5 QUEUE QUE1,QUE2**

   This command limits the number of concurrent outstanding tasks to five for queues QUE1 and QUE2.

3. $ **ACMS/SET QUEUE/TASK_THREADS=5 QUE1,QUE3,QUE4, QUE2 /TASK_THREADS=3**

   This command limits the number of concurrent outstanding tasks to five for queues QUE1, QUE3, and QUE4 and to three for queue QUE2.

ACMS/SET SYSTEM Command

ACMS/SET SYSTEM Command — Depending on the qualifiers used, enables or disables audit trail logging, or enables or disables ACMS operator terminals.

Format

ACMS/SET SYSTEM

Command Qualifiers	Defaults
/[NO]AUDIT	Current setting
/[NO]OPERATOR	Current setting
/PROCESS	Current setting
/TERMINAL=*device-name*	Current setting

Privileges Required

OpenVMS OPER privilege.

Qualifiers

/[NO]AUDIT

The **/AUDIT** qualifier starts the Audit Trail Logger and enables systemwide auditing. The **/NOAUDIT** qualifier stops systemwide auditing. If you do not specify this qualifier, systemwide auditing is not affected.

/[NO]OPERATOR

Enables or disables the terminals identified by the **/PROCESS** qualifier or **/TERMINAL** qualifier as ACMS operator terminals. When you specify the **/OPERATOR** or **/NOOPERATOR** qualifier, you must also specify either the **/PROCESS** or the **/TERMINAL** qualifier. If you do not specify this qualifier, ACMS terminals are not affected.

/PROCESS

If you specify the **/OPERATOR** qualifier, the **/PROCESS** qualifier enables your terminal as an ACMS operator terminal for as long as your current process is active. If you specify the **/NOOPERATOR** qualifier, the **/PROCESS** qualifier disables your terminal as an ACMS operator terminal.

You must specify either the **/OPERATOR** or **/NOOPERATOR** qualifier when you use the **/PROCESS** qualifier. If you do not specify this qualifier, ACMS terminals are not affected.

/TERMINAL=(*device-name*[,...])

If you specify the **/OPERATOR** qualifier, the **/TERMINAL** qualifier identifies one or more terminals as an ACMS operator terminal (for as long as ACMS is active). If you specify the **/NOOPERATOR** qualifier, the **/TERMINAL** qualifier disables one or more terminals as an ACMS terminal. If you specify more than one device name, separate the device names with commas and enclose them in parentheses. A colon (:) in the device name is not required.

You must specify either the **/OPERATOR** or **/NOOPERATOR** qualifier with the **/TERMINAL** qualifier. If you do not specify this qualifier, ACMS terminals are not affected.

Notes

If an application fails, or if the Audit Trail Logger or TSC stops abnormally, ACMS sends a message to ACMS operator terminals to inform you.

You cannot use the **/[NO]PROCESS** qualifier for a batch job.

Examples

1. $ **ACMS/SET SYSTEM/PROCESS/OPERATOR**

   This command enables your terminal as an ACMS operator terminal for the duration of your process or until ACMS stops.

2. $ **ACMS/SET SYSTEM/TERMINAL=(TTE2,TTE3)/OPERATOR**

   This command enables terminals TTE2 and TTE3 as ACMS operator terminals for as long as ACMS is active.

3. $ **ACMS/SET SYSTEM/TERMINAL=TTE2/NOOPERATOR**

   This command disables terminal TTE2 as an ACMS operator terminal.

4. $ **ACMS/SET SYSTEM/AUDIT**

   This command enables the Audit Trail Logger. Use this command to re-enable the Audit Trail Logger after you have disabled it.

ACMS/SHOW APPLICATION Command

ACMS/SHOW APPLICATION Command — Displays information about one or more active ACMS applications in static mode. See the **ACMS/SHOW APPLICATION/CONTINUOUS** command if you want to display an application in continuous mode.

Format

ACMS/SHOW APPLICATION [*application-name*[,...]]

Command Qualifiers	Defaults
/CONNECTIONS	No connection information displayed
/DETACHED_TASKS	No detached task information displayed
/POOL	No pool information displayed
/SERVER_ATTRIBUTES	No server attributes displayed
/TASK_ATTRIBUTES	No task attributes displayed

Privileges Required

None.

Parameters

application-name

The file name of the application you want to display information about. Specify only the file name of the application; do not include device, directory, or file type. If you do not include an application name, ACMS displays information about all active applications. Specify more than one application name by separating the application names with a comma (,).

Qualifiers

/CONNECTIONS

Displays the local and remote users who are connected to the application.

/DETACHED_TASKS

Displays information about all detached tasks that are started and have not completed.

/POOL

Displays information on pool size and available pool space for an application. If you do not specify the **/POOL** qualifier, no pool information is displayed. If you specify the **/POOL** qualifier but do not supply an application name, pool information is displayed for all active applications.

/SERVER_ATTRIBUTES[=(*server-name*[,...])]

Displays the current settings of modifiable server attributes for the specified application. If you specify a server name, ACMS displays the current values of server attributes for the specified server only. Specify more than one server name by separating the server names with a comma (,) and enclosing them in parentheses. If you do not specify a server name, ACMS displays the server attributes for all servers in the specified application.

You can display the settings of the following server attributes:

- Whether server audit logging is enabled or disabled
- The delay time for server creation and deletion
- The interval time for server creation and deletion
- The maximum number of server processes allowed
- The minimum number of server processes allowed
- Whether server process dumps are enabled or disabled

Modify server attributes with the **ACMS/MODIFY APPLICATION/SERVER_ATTRIBUTES** command.

/TASK_ATTRIBUTES[=(*task-name*[,...])]

Displays the current settings of modifiable task attributes for the specified application. If you specify a task name, ACMS displays the task attributes for the specified task only. Specify more than one task name by separating the task names with a comma (,) and enclosing them in parentheses. If you do not specify a task name, ACMS displays task attributes for all tasks in the specified application.

You can display the settings of the following task attributes:

- Whether task-level audit logging is enabled or disabled
- Whether a task is designated as enabled or disabled
- Whether or not DECdtm transaction timeout is set for a task, and at what interval if set

Modify task attributes with the **ACMS/MODIFY APPLICATION/TASK_ATTRIBUTES** command.

Notes

If you specify an application that is not active, ACMS returns an error.

The **ACMS/SHOW APPLICATION** command with no qualifiers displays information that is useful in determining the optimal values for maximum server processes and minimal server processes.

You can use the pool information displayed when you use the **/POOL** qualifier to set the ACMSGEN workspace and control pool sizes. See *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"* for more information on adjusting the pool size for your system.

Examples

1. $ **ACMS/SHOW APPLICATION**

```
ACMS V4.0     CURRENT APPLICATIONS        Time:  5-MAY-1994 13:34:56.41


Application Name: TIME_TEST                            State:  STARTED

    Object Name:       ACMS01EXC001000
    User Name:         NOMIS               PID:              22000123
    Max Task Count:    120                 Max SP Count:     150
    Cur Task Count:    2                   Cur SP Count:     1
    Auditing:          OFF                 SP Mon. Interval: 5

Server Name                 max SPs  min SPs  active   free    waiting
                                                 SPs     SPs     tasks
LAS_SRVR                     1        0        1        0       1


Application Name: SANDAPPL                             State:  STARTED

    Object Name:       ACMS01EXC003000
    User Name:         EDLOD               PID:              2200047C
    Max Task Count:    65535               Max SP Count:     150
    Cur Task Count:    0                   Cur SP Count:     0
    Auditing:          OFF                 SP Mon Interval:  20

Server Name                 max SPs  min SPs  active   free    waiting
                                                 SPs     SPs     tasks
SANDSRV                      5        0        0        0       0
```

This example displays server and task information for all applications started on the local node.

2. $ **ACMS/SHOW APPLICATION QUALITY/SERVER_ATTRIBUTES=(NAME=LAS_SRVR) -**

```
_$ /TASK_ATTRIBUTES

ACMS V4.0       CURRENT APPLICATIONS        Time:  5-MAY-1994
 13:34:56.41


Application Name: QUALITY                                State:  STARTED

    Object Name:        ACMS01EXC001000
    User Name:          NOMIS              PID:                22000123
    Max Task Count:     123                Max SP Count:       150
    Cur Task Count:     1                  Cur SP Count:       1
    Auditing:           OFF                SP Mon. Interval:   10
---------------------- SERVER ATTRIBUTES ----------------------------
Server Name: LAS_SRVR
    Max. SPs:           1                  Min SPs:            0
    Creation Delay:     5                  Creation Interval:  2
    Deletion Delay:     15                 Deletion Interval:  5
    Auditing:           ON                 Process Dumps:      OFF
------------------------ TASK ATTRIBUTES ----------------------------
Task Name: LAS_TASK1
    Status:              ENABLED            Auditing:           ON
    Transaction Timeout: NO TIME LIMIT
Task Name: LAS_TASK2
    Status:              DISABLED           Auditing:           OFF
    Transaction Timeout: 30
```

This example displays the modifiable server attributes for server LAS_SRVR in the application QUALITY. See *Chapter 9, "Installing and Managing Applications"* for a description of the fields in this display.

3. `$ ACMS/SHOW APPLICATION/POOL TEST`

```
ACMS V4.0       CURRENT APPLICATIONS      Time: 20-MAY-1994 11:21:04.50

Application Name: TEST                                   State:  STARTED

    Object Name:        ACMS01EXC008000
    User Name:          WAYNE              PID:                25C01337
    Max Task Count:     65535              Max SP Count:       5
    Cur Task Count:     0                  Cur SP Count:       2
    Auditing:           ON                 SP Mon. Interval:   5

Application Workspace and Control Pools

      Pool          Pool      Free  (pct.) Largest  Allocation  Garbage
      type          size      bytes         block   failures
 collections
Group/User workspace pools
  Control pool      65536     64848 (98%)    32768       0           0
  Workspace pool   131072    130560 (99%)    65536       0           0
TEST_GRP01
  Control pool      25600     25088 (98%)    16384       0           0
  Workspace pool   179200    178688 (99%)    65536       0           0
TEST_GRP02
  Control pool      25600     25088 (98%)    16384       0           0
  Workspace pool   179200    178688 (99%)    65536       0           0
DBMS_GRP
  Control pool      25600     25088 (98%)    16384       0           0
```

```
  Workspace pool   179200    178688 (99%)    65536       0           0
TEST_GRP10
  Control pool      25600     25088 (98%)    16384       0           0
  Workspace pool   179200    178688 (99%)    65536       0           0
TEST_GRP_LANG
  Control pool      25600     25088 (98%)    16384       0           0
  Workspace pool   179200    178688 (99%)    65536       0           0
```

This example displays pool size information for the application TEST. See *Chapter 9, "Installing and Managing Applications"* for a description of the fields in this display.

4.
```
$  ACMS/SHOW APPLICATION/CONNECTIONS
ACMS V4.0    CURRENT APPLICATIONS       Time: 23-APR-1994 10:50:42.95
Application Name: PACCARE_APPL                          State: STARTED
   User Name      Submitter ID        Agent PID      Device
   SMITH          MYNODE::00030035    22400104       TWA3:
   ACMS_TEST      YRNODE::023B0004    (YRNODE::)     LTA5006:
   ACMS_TEST      YRNODE::00B60013    (YRNODE::)     LTA5014:

Application Name: EMPLOYEE_INFO_APPLICATION             State: STARTED
   User Name      Submitter ID        Agent PID      Device
   ACMS_TEST      YRNODE::00B60013    (YRNODE::)     LTA5014:
   ACMS_TEST      YRNODE::023B0004    (YRNODE::)     LTA5006:
   SMITH          MYNODE::00030035    22400104       TWA3:

Application Name: EMPLOYEE_INFO_APPL_RTS                State: STARTED
   There are no users connected to this application
```

This command displays information about all users connected to applications PACCARE_APPL and EMPLOYEE_INFO_APPLICATION. There are no users connected to the application EMPLOYEE_INFO_APPL_RTS.

5.
```
$ ACMS/SHOW APPLICATION/DETACHED_TASKS DIST_APPL
ACMS V4.0       CURRENT APPLICATIONS   Time: 23-APR-1994 09:58:20.65
Application Name: DIST_APPL                    State:  STARTED
  Task Name:  DEQUEUE_TASK
    Task State:       Active
    Submitter ID:     YRNODE::00020016        Username:    JONES
    Retry Limit:      10                      Retry Count: 2
    Retry Wait Timer: 60
  Task Name:  UPDATE_CENTRAL_TASK     Task State:       Waiting to Retry
    Submitter ID:     YRNODE::00020017        Username:    SMITH
    Retry Limit:      10                      Retry Count: 0
    Retry Wait Timer: 60
```

This example shows that the detached tasks DEQUEUE_TASK and UPDATE_CENTRAL_TASK in the application DIST_APPL are started. The task DEQUEUE_TASK is currently active and has retried two times. The task UPDATE_CENTRAL_TASK is waiting to retry. Both tasks wait 60 seconds before retrying, and both tasks have a retry limit of 10.

ACMS/SHOW APPLICATION/CONTINUOUS Command

ACMS/SHOW APPLICATION/CONTINUOUS Command — Displays information about an active ACMS application in continuous refresh mode.

Format

ACMS/SHOW APPLICATION/CONTINUOUS *application-name*

Command Qualifiers	Defaults
/[NO]BEGINNING_TIME=*time*	/NOBEGINNING_TIME
/[NO]ENDING_TIME=*time*	/NOENDING_TIME
/[NO]INTERVAL[=*seconds*]	/NOINTERVAL
/[NO]OUTPUT[=*file-spec*]	/NOOUTPUT

Required Privileges

None.

Parameters

application-name

The file name of an application that you want to display information about. Specify only the file name of an application database file; do not include a device, directory, or file type. You can specify only one application name with each command.

Qualifiers

/[NO]BEGINNING_TIME=*time*

Controls when the command starts displaying information on your terminal screen or when it begins to copy screen information to an output file (if you use **/OUTPUT**). The **/BEGINNING_TIME** qualifier is most useful in a command file. You can specify absolute time or a combination of absolute and delta times. See the *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/#DATE_AND_TIME_SECT] for information about specifying time. The **/NOBEGINNING_TIME** qualifier is the default.

/[NO]ENDING_TIME=*time*

Controls when the command stops displaying information on your terminal screen or when it stops copying screen information to an output file (if you use **/OUTPUT**). The **/ENDING_TIME** qualifier is most useful when used in a command file. You can specify absolute time or a combination of absolute and delta times. See the *VSI OpenVMS User's Manual* [https://docs.vmssoftware.com/vsi-openvms-user-s-manual/#DATE_AND_TIME_SECT] for information about specifying absolute and delta time. The **/NOENDING_TIME** qualifier is the default.

/[NO]INTERVAL=*seconds*

Controls how often a terminal screen is refreshed or how often new information is copied to an output file (if you use **/OUTPUT**). The default is **/INTERVAL=30**.

/[NO]OUTPUT [=*file-spec*]

Controls whether or not display output is sent to a file. If you enter **/OUTPUT** with a partial file specification, ACMSSHOW is the default file name, .LIS is the default file type, and your current

default directory is the directory. The **/NOOUTPUT** qualifier is the default; output is sent to your terminal.

Notes

The **ACMS/SHOW APPLICATION/CONTINUOUS** command provides information you can use to evaluate values in the application definition clause MAXIMUM SERVER PROCESSES, and in the MAXIMUM SERVER PROCESSES and MINIMUM SERVER PROCESSES subclauses.

Control the video display by using the control and arrow keys. Press **Ctrl/C**, **Ctrl/Y**, or **Ctrl/Z** to terminate the display. Press **Ctrl/W** to refresh the screen. Use the up arrow and down arrow keys to scroll the screen forward and backward.

There are cases when the values for average number of active servers, average number of free servers and average number of waiting tasks for a given server are displayed as 0. This can occur even when the displayed maximum values of these quantities are quite large.

The averages that are displayed with the **ACMS/SHOW APPLICATION/CONTINUOUS** command are calculated as follows. Every time that the screen display needs to be refreshed, EXC is polled for data about the servers and a refresh counter is incremented by 1. The average is determined by dividing the running total of the particular data point (i.e. Waiting Tasks) by the number of times that the display has been refreshed. In the case of a data point that has had a noticeable maximum peak over a short amount of time, the average can be very close to zero as the number of refreshes gets very large. The decimal value of the average is rounded down in all cases. So an average of 0.499(9) or less, is rounded down to zero.

Example

```
$ ACMS/SHOW APPLICATION/CONTINUOUS SANDAPPL


                    ACMS CONTINUOUS APPLICATION MONITOR

                          28-MAY-1994 13:48:36.10

Name:    SANDAPPL                                  State:  STARTED
Process: ACMS01EXC003000
User: EDLOD                                        PID:  2200047C

Max Tasks: 65535                                   Max SPs:   5

Cur Tasks: 0                                       Cur SPs:   0


SERVER NAME                Min SP/Max SP  Current  Average  Minimum
 Maximum


SANDSRV                          0/5

    Active Servers                              0        0        0
 0
    Free Servers                                0        1        1
 1
    Waiting Tasks                               0        0        0
 0
```

This command shows the SANDAPPL application in continuous refresh mode. Because you did not name an interval, ACMS changes the screen every 30 seconds. See *Chapter 9, "Installing and Managing Applications"* for a description of each field in this display.

ACMS/SHOW QTI Command

ACMS/SHOW QTI Command — Displays the run-time characteristics of the QTI.

Format

ACMS/SHOW QTI

Required Privileges

None.

Notes

None.

Example

```
$ ACMS/SHOW QTI
ACMS V4.0    QTI - Queued Task Initiator  Time:  14-MAY-1994  16:16:05.52

State:  STARTED                    User Name:        SYSTEM
PID:    11000211                   Process Name:     ACMS01QTI001000
Queues: 2                          Submitter Count:  5
```

This example displays the run-time characteristics of the QTI. See *Chapter 8, "Controlling the ACMS System"* for a description of the fields in this display.

ACMS/SHOW QUEUE Command

ACMS/SHOW QUEUE Command — Displays queue information.

Format

ACMS/SHOW QUEUE [*queue-name*[,...]]

Privileges Required

None.

Parameters

queue-name

The name of the queue that you want to display information about. Specify more than one queue name by separating the queue names with a comma (,). If you do not supply a queue name, ACMS displays information about all queues that are started on your node.

Notes

The queues displayed by the **ACMS/SHOW QUEUE** command are those currently being processed by the Queued Task Initiator (QTI).

Example

```
$ ACMS/SHOW QUEUE MECCAQUEUE
ACMS V4.0    QUEUED TASK QUEUES              Time: 14-MAY-1994 16:16:05.52

Task Queue: MECCAQUEUE                                  State:  STARTED
    Threads:      4           Successful tasks invocations: 783
    Active Tasks: 2           Failed tasks invocations:     4
    Error Queue:  MECCAERROR_QUEUE
    Tasks queued to error queue: 0
```

This example displays queue information about the queue MECCAQUEUE. See *Chapter 8, "Controlling the ACMS System"* for a description of the fields shown in this display.

ACMS/SHOW SERVER Command

ACMS/SHOW SERVER Command — Displays information about one or more servers running under a specified application.

Format

ACMS/SHOW SERVER [*server-name*[,...]]

Command Qualifiers	Defaults
/APPLICATION=*application-name*	All applications

Required Privileges

None.

Parameters

server-name

The name of the server you want to display. Specify more than one server name by separating the server names with a comma (,). If you do not supply a server name, ACMS displays information on all servers.

Qualifiers

/APPLICATION=*application-name*

Specifies an application that contains the server or servers you want to display. Specify only the file name of the application database file; do not specify a device, directory, or file type. If you do not specify the **/APPLICATION** qualifier, all servers in all active applications are displayed.

Notes

None.

Examples

1. $ **ACMS/SHOW SERVER ACMS_TEST_SERVER/APPLICATION=ACMS_TEST_APPL**

```
ACMS V4.0     CURRENT SERVERS       Time:  8-MAY-1994 13:42:28.91

Application Name: ACMS_TEST_APPL                  State:  STARTED

    Server Name: ACMS_TEST_SERVER

        Process Name: ACMS007SP001001              State:  ACTIVE
        User Name:      TEST_USER                  PID:    212004A6
        Image:          TESTS::ACMS_TEST_SERVER.EXE;23
        Active Task:    DEMO_TASK
        Task ID:        NODE1::00010029-0000000F

        Process Name: ACMS007SP001002              State:  FREE
        User Name:      TEST_USER                  PID:    212004A9
        Image:          ACMS_TEST_SERVER.EXE;23
        Active Task:    NONE
        Task ID:        NONE
```

   This example displays information about the server ACMS_TEST_SERVER running under the application ACMS_TEST_APPL.

2. $ **ACMS/SHOW SERVER ACMS_DCL_SERVER/APPLICATION_NAME=ACMS_TEST_APPL**

```
ACMS V4.0     CURRENT SERVERS       Time:  8-MAY-1994 13:42:28.91

Application Name: ACMS_TEST_APPL                State:  STARTED

    Server Name: ACMS_DCL_SERVER

        Process Name: ACMS008SP001000            State:  ACTIVE
        User Name:      DEMO_USER   (DYNAMIC)    PID:    2120073C
        Image:          DCL SERVER PROCESS
        Active Task:    DCL_TASK
        Task ID:        NODE1::0001002F-00000017
```

   This example displays information about the server ACMS_DCL_SERVER running under the application ACMS_TEST_APPL.

ACMS/SHOW SYSTEM Command

ACMS/SHOW SYSTEM Command — Displays information about the ACMS run-time system, all local and remote users, and all local applications.

Format

ACMS/SHOW SYSTEM

Command Qualifiers	Defaults
/POOL	No pool information displayed
/ALL	All processes using message-switch displayed

Privileges Required

None.

Qualifiers

/POOL

Displays information on pool size and available pool space for the system message switch pools for ACMS processes. No information on current users or applications is displayed when you specify the **/POOL** qualifier. If you do not specify the **/POOL** qualifier, no pool information is displayed.

/ALL

Use the **/ALL** qualifier with the **/POOL** qualifier to display information on pool size and available pool space for the system message switch pools for user-written agent processes, agents using the ACMSDEBUG Utility, and processes executing operator commands, in addition to information for ACMS processes.

Notes

You can use the pool information displayed when you use the **/POOL** qualifier to set the ACMSGEN parameters MSS_POOLSIZE and MSS_PROCESS_POOL. See *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"* for more information on adjusting the pool size for your system.

Examples

1.
```
$ ACMS/SHOW SYSTEM
ACMS V4.0  Current System State: STARTED  Time: 23-APR-1994 10:53:37.70
Terminal Subsystem State:    STARTED
Queued Task Initiator State: STOPPED
System Auditing State:       ENABLED

Active ACMS Users

User Name      Submitter ID        Agent PID      Device
SMITH          MYNODE::00030035    22400104       TWA3:
SMITH          MYNODE::00030040    22400104       TWA4:
ACMS_TEST      YRNODE::00B60013    (YRNODE::)     LTA5014:
ACMS_TEST      YRNODE::023B0004    (YRNODE::)     LTA5006:

Active Execution Controllers

Application Name           Process Name       User Name     Exc PID
PACCARE_APPL               ACMS01EXC002000    ACMS_TEST     224000CE
EMPLOYEE_INFO_APPLICATION  ACMS01EXC003000    SMITH         224000D7
EMPLOYEE_INFO_APPL_RTS     ACMS01EXC004000    EMPLOYEE_EXC  224000D9
```

This command displays information about ACMS. The display describes the current system state as STARTED and lists all ACMS users, active applications, and their Application Execution Controllers (EXC). See *Chapter 8, "Controlling the ACMS System"* for an itemized description of each field in this display.

2.
```
$ ACMS/SHOW SYSTEM/POOL
ACMS V4.0  Current System State: STARTED  Time: 23-APR-1994 10:53:37.70
Terminal Subsystem State:     STARTED
Queued Task Initiator State:  STOPPED
System Auditing State:        ENABLED

ACMS System Message Switch Pools

    Process          Pool     Free   (pct)  Largest  Allocation    Garbage
      name           size     bytes          block    failures
 collections
< Shared Pool >    262144   228056 (86%)    65536        0            0
ACMS01ACC001000    131072   121168 (92%)    65536        0            0
ACMS01ATL001000    131072   127024 (96%)    65536        0            0
ACMS01TSC001000    131072   126544 (96%)    65536        0            0
ACMS01CP001000     131072   123824 (94%)    65536        0            0
ACMS01EXC008000    131072   123312 (94%)    65536        0            0
ACMS008SP001000    131072   125552 (95%)    65536        0            0
ACMS008SP002013    131072   126704 (96%)    65536        0            0
```

This example displays pool size information about the current ACMS system. The display shows the current active system processes, the amount of pool space they use, the number of free bytes of pool space available, the largest block of pool space currently used, the number of allocation failures (if any), and the number of attempts to use fragmented pool space. See *Chapter 8, "Controlling the ACMS System"* for an itemized description of each field in this display.

ACMS/SHOW TASK Command

ACMS/SHOW TASK Command — Displays information about one or more active ACMS tasks executing on the local node.

Format

ACMS/SHOW TASK [*task-name*[,...]]

Command Qualifiers	Defaults
/APPLICATION=*application-name*	All applications
/DEVICE=*device-name*	All devices
/IDENTIFIER=*task-id*	All tasks
/SUBMITTER=*submitter-id*	All submitters
/USER=*user-name*	All users

Required Privileges

None.

Parameters

task-name

The name of the task assigned in the application definition. If you do not specify a task name, ACMS displays information about all active tasks. Specify more than one task name by separating the task names with a comma (,).

Qualifiers

/APPLICATION=*application-name*

Names the application in which the task or tasks you want to display are defined. The application name is the file name of the application database file. Do not include device, directory, or file type (.ADB). If you omit this qualifier, ACMS searches all applications on the node for the tasks you specify. If you include an application name with the **/APPLICATION** qualifier, ACMS searches for the task name in that application only.

/DEVICE=*device-name*

Displays only those tasks that have the specified device name. Device name is the name of the terminal at which the task is running. You must end the device name with a colon (:). When you do not specify the **/DEVICE** qualifier, ACMS does not select tasks by device name to display.

/IDENTIFIER=*task-id*

Displays only those tasks that have the specified ID. ACMS assigns a unique task ID to each task a user selects. You need not specify leading and trailing zeros when specifying a task ID. You can display information on tasks called by other tasks. Refer to *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about specifying a task ID.

/SUBMITTER=*submitter-id*

Displays only those tasks that have the specified user ID. ACMS assigns a unique user ID to each user who signs in. You need not specify leading and trailing zeros when specifying a submitter ID. Refer to *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about specifying a submitter ID.

If you do not specify the **/SUBMITTER** qualifier, ACMS does not select tasks by submitter ID to display.

/USER=*user-name*

Displays only those tasks that were submitted by the user with the specified user name

Notes

If you do not specify a qualifier, the **ACMS/SHOW TASK** command displays information about all active tasks as well as all tasks called by other tasks.

The **ACMS/SHOW TASK** command does not display the transaction ID (TID) for a task that is executing a transaction step if that transaction step is a single processing step. The **ACMS/SHOW TASK**

command displays the TID only for all composed tasks and for tasks where the transaction step is a block step.

Example

```
$ ACMS/SHOW TASK

ACMS V4.0   CURRENT TASKS           Time: 28-MAY-1994 13:35:23.19
Task Name:  MON_TASK
  Task ID:          WOW::0001000D-00000001
  Application:      LAS_APPL                      User Name:     CAMEO

  Submitter ID:     WOW::0001000D                 Device:        TTB1:

Task Name:  OPR_TASK
  Task ID:          WOW::00020013-00000003
  Application:      LAS_APPL                      User Name:    NOMIS

  Submitter ID:     WOW::00020013                 Device:       TTH0:
  Called Task:      OPR_TASK_A
      Task ID:      WOW::00020013-00000003-00000001
  Called Task:      OPR_TASK_B
      Task ID:      WOW::00020013-00000003-00000002
```

This command displays information about all tasks active on the local node. See *Chapter 9, "Installing and Managing Applications"* for a description of each field shown in this display.

ACMS/SHOW USER Command

ACMS/SHOW USER Command — Displays information about ACMS users. With qualifiers, displays information about only those users you identify.

Format

ACMS/SHOW USER [*user-name*[,...]]

Command Qualifiers	Defaults
/ALL	/ALL
/APPLICATION	All applications
/DEVICE=*device-name*	All devices
/[NO]FULL	/NOFULL
/LOCAL	All submitters
/REMOTE	All submitters
/SUBMITTER=*submitter-id*	All submitters

Privileges Required

None.

Parameters

user-name

Specifies the name of the user that you want to display information about. If you do not specify a user name, the **ACMS/SHOW USER** command displays information about all ACMS users. Specify more than one user name by separating each user name with a comma (,).

Qualifiers

/ALL

Displays information for both local and remote users. Local users are those who sign in to ACMS on the local node. Remote users are those who select tasks from a remote node. In addition, the **/ALL** qualifier displays the total number of users accessing the ACMS system. **ACMS/SHOW USER/ALL** is the default.

You cannot specify the **/ALL** qualifier with the **/LOCAL** or **/REMOTE** qualifier.

/APPLICATION

Displays each local application that a user is connected to.

/DEVICE=*device-name*

Displays information about ACMS users at the specified terminal. The device name is a terminal ID. You must end the device-name with a colon (:). If you do not specify the **/DEVICE** qualifier, ACMS does not select users by device name to display information about.

/[NO]FULL

Displays task information for each user. The default is **/NOFULL**.

/LOCAL

Displays information for local users only. Local users are those who sign in to ACMS on the local node. You cannot specify the **/LOCAL** qualifier with the **/REMOTE** or **/ALL** qualifier.

/REMOTE

Displays information only about remote users currently accessing applications on the local node. Remote users are those who selected tasks from a remote node. You cannot specify the **/REMOTE** qualifier with the **/LOCAL** or **/ALL** qualifier.

/SUBMITTER=*submitter-id*

Displays information only about users that have the specified submitter ID. ACMS assigns a unique submitter ID to each user who signs in. Refer to *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about specifying a submitter ID.

If you do not specify the **/SUBMITTER** qualifier, ACMS does not select users by submitter ID to display information about.

Notes

If you do not specify a user name or use any of the qualifiers, the **ACMS/SHOW USER** command displays information about all users.

If a user is signed in at more than one terminal, you can use the **/DEVICE** qualifier to get information about the user's activity at one of the terminals. This qualifier is valid only for local users.

If you have the OPER privilege, you can cancel one or more local users by using the **ACMS/CANCEL USER** command.

The **ACMS/SHOW USER/FULL** command does not display information about called tasks. Use the **ACMS/SHOW TASK** command to display information about called tasks.

Use the **/LOCAL** qualifier to display information about local users.

Use the **/REMOTE** qualifier to display information about remote users.

Use the **/ALL** qualifier (the default) to display information about both local and remote users.

Use the **/APPLICATION** qualifier to see a list of local applications that the user is connected to.

Examples

1. $ **ACMS/SHOW USER/ALL**

```
ACMS V4.0    CURRENT USERS        Time: 16-MAR-1994 16:32:14.93
User name:      SMITH             Submitter ID: VAXA::0001001E   Agent
 PID:    22E000C0          Device:       TWA2:
User name:      JONES             Submitter ID: VAXA::0002001E   Agent
 PID:    22E000C0          Device:       RTA2:
User name:      TOWERS            Submitter ID: VAXA::0004001E   Agent
 PID:    22E000C0          Device:       LTA2:
User name:      NEWMAN            Submitter ID: VAXB::0006001E Agent
 PID:      (VAXB::)          Device:       TWA2:
User name:      JACKSON           Submitter ID: VAXB::0007001E   Agent
 PID:    (VAXB::)          Device:       LTA12:
User name:      SMITH_S           Submitter ID: VAXC::0008001E   Agent
 PID:    (VAXB::)          Device:       LTA22:
Total known active users:         6
```

   This command displays information about all local and remote users signed in to ACMS on the node. For nodes with concurrent-use licenses, the total number of active users represents the number of license units in use. **ACMS/SHOW USER/ALL** is the default.

2. $ **ACMS/SHOW USER/LOCAL**

```
ACMS V4.0    CURRENT USERS        Time: 16-MAR-1994 16:32:14.93
User Name:   SMITH                Submitter ID: VAXA::0001001E   Agent
 PID: 22E000C0             Device:       TWA2:
User name:   JONES                Submitter ID: VAXA::0002001E   Agent
 PID: 22E000C0             Device:       RTA2:
User name:   TOWERS               Submitter ID: VAXA::0004001E   Agent
 PID: 22E000C0             Device:       LTA2:
```

   This command displays information about all local users signed in to ACMS.

3. $ **ACMS/SHOW USER/APPLICATION**

```
ACMS V4.0       CURRENT USERS     Time: 23-APR-1994 10:45:19.14
User Name:   SMITH                Submitter ID: MYNODE::00030035
  Agent PID: 22400104             Device:       TWA3:
    Application: PACCARE_APPL
    Application: EMPLOYEE_INFO_APPLICATION
```

```
User Name:   SMITH                Submitter ID: MYNODE::00030040
  Agent PID: 22400104             Device:       TWA4:
    This user is not connected to any applications

User Name:   ACMS_TEST            Submitter ID: YRNODE::00B60013
  Agent PID: (YRNODE::)           Device:       LTA5014:
    Application: EMPLOYEE_INFO_APPLICATION
    Application: PACCARE_APPL

User Name:   ACMS_TEST            Submitter ID: YRNODE::023B0004
  Agent PID: (YRNODE::)           Device:       LTA5006:
    Application: EMPLOYEE_INFO_APPLICATION
    Application: PACCARE_APPL
Total known active users:   4
```

This command displays information about all local and remote users signed in to ACMS on the node and lists the local applications that each user is connected to. For nodes with concurrent-use licenses, the total number of known active users represents the number of license units in use.

4. `$ ` **`ACMS/SHOW USER/APPLICATION/LOCAL`**

```
ACMS V4.0    CURRENT USERS        Time: 16-MAR-1994 16:32:14.93

User Name:     SMITH              Submitter ID: VAXA::0001001E
  Agent PID:   22E000C0           Device:       TWA2:
    Application: EMPLOYEE_INFO_APPLICATION
    Application: PAYROLL_APPLICATION
    Application: ACCOUNTING_APPLICATION

User Name:      JONES             Submitter ID: VAXA::0002001E
  Agent PID:    22E000C0          Device:       RTA2:
    Application: PAYROLL_APPLICATION

User name:      JONES_J           Submitter ID: VAXA::0003001E
  Agent PID:    22E000C0          Device:       RTA3
    This user is not connected to any application

User name:      TOWERS            Submitter ID: VAXA::0004001E
  Agent PID:    22E000C0          Device:       LTA2:
    Application: INVENTORY_APPLICATION
    Application: ORDER_ENTRY_APPLICATION
    Application: CREDIT_INQUIRY_APPLICATION
```

This command displays information about all local users and lists the local applications that each user is connected to.

5. `$ ` **`ACMS/SHOW USER/DEVICE=RTA2:`**

```
ACMS V4.0    CURRENT USERS        Time: 16-MAR-1994 16:32:14.93
User Name:      JONES             Submitter ID: VAXA::0002001E
  Agent PID:    22E000C0          Device:       RTA2:
```

This command displays information about the user signed in to ACMS at terminal RTA2:.

6. `$ ` **`ACMS/SHOW USER/FULL`**

```
ACMS V4.0    CURRENT USERS        Time: 16-MAR-1994 16:32:14.93
User Name:     SMITH              Submitter ID: VAXA::0001001E
  Agent PID:   22E000C0           Device:       TWA2:
```

```
Task Name:  EMPLOYEE_INFO_UPDATE_TASK
  Task ID:     VAXA::0001001E-00000001
  Appl Name:   EMPLOYEE_INFO_APPLICATION
  Appl Node:   VAXA::

User Name:     JONES              Submitter ID: VAXA::0002001E
  Agent PID:   22E000C0           Device:       RTA2:
   User JONES has no active tasks.

User name:     TOWERS             Submitter ID: VAXA::0004001E
  Agent PID:   22E000C0           Device:       LTA2:

Task Name:  ORDER_ADD   Task ID:     VAXA::0004001E-00000001
  Appl Name:   ORDER_ENTRY_APPLICATION   Appl Node:   VAXA::
```

This command displays information about all local users and lists the tasks submitted by those users.

7.
```
$ ACMS/SHOW USER/REMOTE
ACMS V4.0    CURRENT USERS        Time: 16-MAR-1994 16:32:14.93
User name:      NEWMAN            Submitter ID: VAXB::0006001E
  Agent PID:    (VAXB::)          Device:       TWA2:

User name:      JACKSON           Submitter ID: VAXB::0007001E
  Agent PID:    (VAXB::)          Device:       LTA12:

User name:      SMITH_S           Submitter ID: VAXC::0008001E
  Agent PID:    (VAXC::)          Device:       LTA22:
```

This command displays information about all remote users.

8.
```
$ ACMS/SHOW USER/REMOTE/APPLICATION
ACMS V4.0    CURRENT USERS        Time: 16-MAR-1994 16:32:14.93
User name:      NEWMAN            Submitter ID: VAXB::0006001E
  Agent PID:    (VAXB::)          Device:       TWA2:
    Application: PAYROLL_APPLICATION
    Application: ACCOUNTING_APPLICATION

User name:      JACKSON           Submitter ID: VAXB::0007001E
  Agent PID:    (VAXB::)          Device:       LTA12:
    Application: EMPLOYEE_INFO_APPLICATION
    Application: PAYROLL_APPLICATION
    Application: ACCOUNTING_APPLICATION
    Application: INVENTORY_APPLICATION
    Application: ORDER_ENTRY_APPLICATION
    Application: CREDIT_INQUIRY_APPLICATION

User name:      SMITH_S           Submitter ID: VAXC::0008001E
  Agent PID:    (VAXC::)          Device:       LTA22:
    Application: PAYROLL_APPLICATION
    Application: CREDIT_INQUIRY_APPLICATION
```

This command displays information about all remote users signed in to ACMS and lists the local applications that each user is connected to.

ACMS/START APPLICATION Command

ACMS/START APPLICATION Command — Starts one or more ACMS applications.

Format

ACMS/START APPLICATION *application-name*[,...]

Privileges Required

OpenVMS OPER privilege.

Parameters

application-name

The file name of the application you want to start. Specify only the file name of the application database file; do not include device, directory, or file type. You must specify at least one application name. Specify more than one application name by separating each name with a comma (,).

Notes

The ACMS system must be started before you use the **ACMS/START APPLICATION** command. Specify the **ACMS/START SYSTEM** command to start ACMS.

Before you use the **ACMS/START APPLICATION** command, ACMS$DIRECTORY must be defined in SYS$MANAGER:SYSTARTUP_VMS.COM as a system logical name pointing to the directory that contains the application database files. When you start applications, application database files must reside in ACMS$DIRECTORY.

The **ACMS/START APPLICATION** command can stall when you start an application if both of the following conditions are present:

- The application is defined with minimum server processes greater than zero.
- A server cannot start. This usually indicates a problem in the initialization procedure, such as an infinite loop in the program.

If these conditions are present, ACMS displays the following messages:

```
%ACMSOPR-E-STRTAPLERR, Error while attempting to START APPLICATION
 application-name
-ACMSOPS-W-TIMEOUT, Timed out waiting for reply from ACMS component
%ACMSOPR-E-ERROR, Some operations may not have been performed
```

Use the **ACMS/SHOW SYSTEM** command to find the process ID (PID) for the Application Execution Controller or the PID of the hanging server process. **ACMS/SHOW SYSTEM** displays the PID that you can use in the following command to recover from the error:

```
$ STOP/ID=<pid>
```

If the **ACMS/START APPLICATION** command fails and the Software Event Log (SWL) report indicates an "exceeded quota " error for the EXC, the quota for the buffered **I/O** byte count limit (BYTLM) is probably not set properly. Increase this quota for the user name of the application, and try the command again. Refer to *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* for information about setting the proper quota limit for BYTLM.

Example

```
$ ACMS/START APPLICATION PERSONNEL, DEPARTMENT
```

This command starts the PERSONNEL and DEPARTMENT applications.

ACMS/START QTI Command

ACMS/START QTI Command — Starts the QTI.

Format

ACMS/START QTI

Privileges Required

OpenVMS OPER privilege.

Notes

You must start ACMS before you can use the **ACMS/START QTI** command.

You must start The QTI must be started before queues can be started. You can also start the QTI by specifying the **ACMS/START SYSTEM** command with the **/QTI** qualifier.

Stop the QTI by using the **ACMS/STOP QTI** command.

Example

```
$ ACMS/START QTI
```

This example starts the QTI.

ACMS/START QUEUE Command

ACMS/START QUEUE Command — Starts the task queue you specify. Once you start a task queue, the QTI begins processing any queued task elements in the queue.

Format

ACMS/START QUEUE *queue-name*[,...]

Command Qualifiers	Defaults
/ERROR_QUEUE=*error-queue-name*	No error queue
/TASK_THREADS=*n*	/TASK_THREADS=1

Required Privileges

OpenVMS OPER privilege.

Parameters

queue-name

The name of a task queue created by the ACMS Queue Manager (ACMSQUEMGR). You must supply at least one queue name. Specify more than one queue name by separating each name with a comma (,).

Qualifiers

/ERROR_QUEUE=*error-queue-name*

Specifies the error queue for a task queue. If you specify this qualifier, queued tasks that do not complete successfully are placed on the specified error queue. Any errors are recorded in the Audit Trail Logger.

The **/ERROR_QUEUE** qualifier is a positional qualifier. If you specify the **/ERROR_QUEUE** qualifier between the **ACMS/START QUEUE** command and the queue names, all queue names are affected. If you specify the **ACMS/START QUEUE** command after a queue name, only that queue name is affected.

If you do not specify the **/ERROR_QUEUE** qualifier, no error queue is associated with the task queue. When an error occurs, the task is deleted from the queue.

/TASK_THREADS=*n*

Specifies the number of concurrent outstanding tasks that the QTI processes for a queue. Here, *n* indicates a value from 1 through 256.

The **/TASK_THREADS** qualifier is a positional qualifier. If you position the **/TASK_THREADS** qualifier between the **ACMS/START QUEUE** command and the queue names, all queue names are affected. To have the **/TASK_THREADS** qualifier apply to an individual queue name in a list of queue names, place the qualifier directly after the queue name. See the examples section.

The default is **/TASK_THREADS=1**.

Notes

The error queue you specify with the **/ERROR_QUEUE** qualifier must exist. You create an error queue with the ACMSQUEMGR Utility. See *Chapter 5, "Creating and Managing Queues"* for information on the ACMSQUEMGR

You can queue tasks to a queue and remove tasks from a queue using ACMS Queued Task Services even though a queue is not started.

Examples

1. `$ ACMS/START QUEUE ACCTS_QUE`

   This example starts the ACMS task queue ACCTS_QUE.

2. `$ ACMS/START QUEUE MAWAH_QUE/ERROR_QUEUE=W_ERROR, MY_QUE -`

```
_$ /ERROR_QUEUE=M_ERROR
```

This example starts the task queues MAHWAH_QUE and MY_QUE and any tasks in these queues. If any tasks in MAHWAH_QUE do not complete normally, they are placed on the error queue W_ERROR. If any tasks in MY_QUE do not complete normally, they are placed on the error queue M_ERROR.

3. `$ ACMS/START QUEUE PARTS_QUE, FAST_QUE /TASK_THREADS=5`

   This example starts the task queues PARTS_QUE and FAST_QUE. The maximum number of concurrent outstanding tasks for PARTS_QUE is set to the default value. For FAST_QUE, the maximum number of concurrent outstanding tasks is set to 5.

ACMS/START SYSTEM Command

ACMS/START SYSTEM Command — Starts the ACMS system.

Format

ACMS/START SYSTEM

Command Qualifiers	Defaults
/[NO]AUDIT	/AUDIT
/[NO]QTI	/NOQTI
/[NO]TERMINALS	/TERMINALS

Privileges Required

OpenVMS OPER privilege.

Qualifiers

/[NO]AUDIT

The **/AUDIT** qualifier starts ACMS with audit trail logging enabled. The **/AUDIT** qualifier is the default. After you start ACMS, you can control the Audit Trail Logger with the **ACMS/SET SYSTEM** and **ACMS/RESET TERMINALS** commands.

/[NO]QTI

The **/QTI** qualifier starts the QTI when ACMS is started. Once the QTI is started, you can start one or more queues with the **ACMS/START QUEUE** command. If you specify the **/NOQTI** qualifier, the QTI is not started with ACMS. The **/NOQTI** qualifier is the default.

/[NO]TERMINALS

The **/TERMINALS** qualifier starts the TSC when ACMS is started. The **/TERMINALS** qualifier is the default. If you specify the **/NOTERMINALS** qualifier, the TSC is not started with ACMS. If you specify **/NOTERMINALS**, you can start the TSC at a later time with the **ACMS/START TERMINALS** command.

Notes

Include the **ACMS/START SYSTEM** and **ACMS/START APPLICATION** commands in your OpenVMS site-specific startup file (SYS$MANAGER:SYSTARTUP_VMS.COM) to start ACMS and ACMS applications automatically when OpenVMS starts.

When you start the TSC with the **ACMS/START SYSTEM** command, recently assigned terminal sign-in characteristics defined by the DDU take effect.

If you do not start the QTI when you start ACMS, you can specify the **ACMS/START QTI** command to start the QTI at a later time.

Examples

1. ```
   $ ACMS/START SYSTEM/NOTERMINALS
   $ ACMS/START APPLICATION PERSONNEL,DEPARTMENT
   $ ACMS/START TERMINALS
   ```

   The first command starts ACMS without starting the TSC. At this point, users cannot sign in to ACMS. The second command starts the PERSONNEL and DEPARTMENT applications. The third command starts the TSC so users can sign in to ACMS and select tasks in the PERSONNEL or DEPARTMENT applications.

2. ```
   $ ACMS/START SYSTEM/QTI
   $ ACMS/START APPLICATION PERSONNEL,DEPARTMENT
   ```

   These commands are part of a command file for starting ACMS and ACMS applications. When you run the command file, the first command starts ACMS, the QTI, and the TSC. The second command starts the PERSONNEL and DEPARTMENT applications, so users can select tasks in those applications.

ACMS/START TASK Command

ACMS/START TASK Command — Starts a detached task in the specified application.

Format

ACMS/START TASK *task-name application-name*

Privileges Required

OpenVMS OPER and SYSPRV privileges.

Parameters

task-name

The name of the task that you want to start as a detached task. The task must contain no exchange steps and you must define the task with the NO I/O phrase. The task name must exist in the application specified by the application-name parameter.

application-name

Specifies the file name of the application in which the detached task executes. Specify only the file name of an application database file; do not include a device, directory, or file type.

Qualifiers

/[NO]LOG

Controls whether or not ACMS displays a message after the detached task has been successfully started. The **/NOLOG** qualifier is the default.

/[NO]RETRY_LIMIT[=*n*]

Specifies the maximum number of times ACMS retries the task after a failure. Specifying **/NORETRY_LIMIT** indicates that ACMS always retries after a failure. The **/RETRY_LIMIT=0** qualifier is the default, which directs ACMS to never retry the task after a failure.

/SELECTION_STRING=*selection-string*

Specifies the data to be passed to the ACMS$SELECTION_STRING system workspace in a task. The default is to pass a null string to the ACMS$SELECTION_STRING system workspace.

/USERNAME=*user-name*

Specifies the submitter user name under which the detached task is signed in. The default is the OpenVMS user name under which the Application Execution Controller (EXC) executes. If you specify an OpenVMS user name that is different than the EXC user name, the user name must be identified as an agent in the ACMS user definition file.

/WAIT_TIMER=*n*

Specifies the number of seconds ACMS waits before retrying the task after a task failure. The **/WAIT_TIMER=5** is the default; the minimum value is 1 and the maximum value is 65,535 seconds.

Notes

The **ACMS/START TASK** operator command completes when the detached task has started successfully, or if it fails to start. If the detached task fails immediately after the task starts executing, the failure is not reported by the **ACMS/START TASK** operator command, because the ACMS Operator Utility does not wait for the task to complete.

Before starting a detached task, you must start the application associated with the task. A user is signed in when starting a detached task. As a result, a set of license units is consumed, if the ACMS system has a loaded concurrent-user license.

The submitter user name under which a detached task is signed in must have an entry in the ACMSUDF.DAT file with the **/AGENT** qualifier. The user name is either the user name specified with the **/USERNAME** qualifier of the **ACMS/START TASK** operator command or the default EXC user name of the application.

Example

```
$ ACMS/START TASK dequeue_task dist_appl -
```

```
_$ /RETRY_LIMIT=10/WAIT_TIMER=30/USERNAME=SMITH
```

This command starts the detached task, called dequeue_task, in the application dist_appl. The task can be retried a maximum of 10 times after task failures, and ACMS waits 30 seconds before it retries the task. The task is submitted with the user name SMITH.

ACMS/START TERMINALS Command

ACMS/START TERMINALS Command — Starts the TSC when ACMS is running. This command enables terminal users to access ACMS menus

Format

ACMS/START TERMINALS

Privileges Required

OpenVMS OPER privilege.

Notes

You cannot start the TSC unless ACMS is active. Users cannot sign in to ACMS unless the TSC is started.

Use this command to start the TSC after specifying the **/NOTERMINALS** qualifier when you started ACMS, or to restart the TSC after stopping it with the **ACMS/STOP TERMINALS** command.

When you start the TSC, recently assigned terminal sign-in characteristics defined by the DDU take effect. Starting the TSC also authorizes any new terminals added since the last time the TSC was started and releases any that are no longer authorized.

The **ACMS/START TERMINALS** only allows terminal users on the local system to access the ACMS menus. It does not affect whether or not remote users can access applications on the local system or whether or not users using other task submitting agents (such as ALL-IN-1) can select ACMS tasks.

Examples

1.
```
$ ACMS/START TERMINALS
```

   This command starts or restarts the TSC. Users can then sign in to ACMS.

2.
```
$ ACMS/START SYSTEM/QTI/NOTERMINALS
$ ACMS/START APPLICATION DEPARTMENT,PERSONNEL
$ ACMS/START TERMINALS
```

   This series of commands starts ACMS and the QTI, starts ACMS applications, and starts the TSC, respectively. The **ACMS/START TERMINALS** command starts the TSC separately from ACMS so users cannot sign in until applications are active.

ACMS/STOP APPLICATION Command

ACMS/STOP APPLICATION Command — Stops one or more ACMS applications.

Format

ACMS/STOP APPLICATION *application-name*[,...]

Command Qualifiers	Defaults
/[NO]CANCEL	/NOCANCEL

Privileges Required

OpenVMS OPER privilege.

Parameters

application-name

The name of the application that you want to stop. Specify only an application name; do not include device, directory, or file type. You must specify at least one application name. Specify more than one application name by separating each name with a comma (,).

Qualifiers

/[NO]CANCEL

The **/CANCEL** qualifier cancels an active task in the application you are stopping. If you use the **/NOCANCEL** qualifier, ACMS waits until all active tasks stop before stopping the application. The **/NOCANCEL** qualifier is the default.

Notes

Once you specify the **ACMS/STOP APPLICATION** command, no new tasks can be started.

The **ACMS/STOP APPLICATION** command executes only when there are no tasks active in the application you specify. If there are active tasks in the application you want to stop, use the DCL **REPLY** command to ask users to halt or complete the tasks and then sign out. You can then use the **/CANCEL** qualifier to stop any tasks that remain active. Restart applications by specifying the **ACMS/START APPLICATION** command.

See the *VSI OpenVMS DCL Dictionary: N–Z* [https://docs.vmssoftware.com/vsi-openvms-dcl-dictionary-n-z/] for information about the DCL **REPLY** command.

Examples

1. `$ ACMS/STOP APPLICATION DEPARTMENT/CANCEL`

   This command cancels any active tasks in the application DEPARTMENT and stops the application. Terminal users cannot select and run tasks in the application DEPARTMENT.

2. `$ ACMS/STOP APPLICATION PERSONNEL,DEPARTMENT/CANCEL`

   This command cancels any active tasks in the PERSONNEL and DEPARTMENT applications and stops the applications. Terminal users cannot select and run tasks in these applications.

ACMS/STOP QTI Command

ACMS/STOP QTI Command — Stops the QTI and all active task queues.

Format

ACMS/STOP QTI

Command Qualifiers	Defaults
/[NO]CANCEL	/NOCANCEL

Required Privileges

OpenVMS OPER privilege.

Qualifiers

/[NO]CANCEL

The **/CANCEL** qualifier cancels all active tasks in all active queues. If you use the **/NOCANCEL** qualifier, ACMS waits until all active tasks stop before stopping the QTI and task queues. The **/NOCANCEL** qualifier is the default.

Notes

Restart a queue by using the **ACMS/START QTI** and **ACMS/START QUEUE** commands.

Example

```
$ ACMS/STOP QTI
```

This command stops the QTI and all active queues.

ACMS/STOP QUEUE Command

ACMS/STOP QUEUE Command — Stops the specified task queue.

Format

ACMS/STOP QUEUE *queue-name*[,...]

Command Qualifiers	Defaults
/[NO]CANCEL	/NOCANCEL

Required Privileges

OpenVMS OPER privilege.

Parameters

queue-name

The name of the task queue you want to stop. You must specify at least one queue name. Stop more than one queue by separating the queue names with a comma (,).

Qualifiers

/[NO]CANCEL

The **/CANCEL** qualifier cancels all active tasks in the queue you are stopping. If you use the **/NOCANCEL** qualifier, ACMS waits until all active tasks complete before stopping the queue. The **/NOCANCEL** qualifier is the default.

Notes

When you specify the **ACMS/STOP QUEUE** command, the specified task queue is stopped by the QTI.

Even though a task queue is stopped, queued task elements can still be initiated to the queue.

Example

```
$ ACMS/STOP QUEUE ALAS_QUE, ALACK_QUE
```

This command stops the task queues ALAS_QUE and ALACK_QUE.

ACMS/STOP SYSTEM Command

ACMS/STOP SYSTEM Command — Stops the ACMS system, the TSC, the QTI, and all applications.

Format

ACMS/STOP SYSTEM

Command Qualifiers	Defaults
/[NO]CANCEL	/NOCANCEL

Privileges Required

OpenVMS OPER privilege.

Qualifiers

/[NO]CANCEL

If you specify the **/CANCEL** qualifier, all active tasks are canceled immediately. If you specify **/NOCANCEL**, ACMS waits until all active tasks are either completed or halted before stopping the ACMS system. The default is **/NOCANCEL**.

Notes

Once you specify the **ACMS/STOP SYSTEM** command, no new tasks can be started.

Include the **ACMS/STOP SYSTEM/CANCEL** command in your OpenVMS site-specific shutdown file, SYS$MANAGER:SYSHUTDWN.COM.

If the ACMS system stalls, you might not be able to use the **ACMS/STOP SYSTEM** command to stop it. Use the **STOP** command from DCL to stop the ACMS Central Controller (ACC) process. Stop the remaining ACMS process using the **ACMS/STOP SYSTEM** command.

The **ACMS/STOP SYSTEM** command executes only when there are no tasks active. If there are active tasks, ACMS waits for the tasks to complete before executing the **ACMS/STOP SYSTEM** command, and also disables any new tasks from starting. Use the DCL **REPLY** command to ask users to halt or complete their tasks, and then sign out before issuing the **ACMS/STOP SYSTEM** command. You can then use the **/CANCEL** qualifier to stop any tasks that remain active.

See the *VSI OpenVMS DCL Dictionary: N–Z* [https://docs.vmssoftware.com/vsi-openvms-dcl-dictionary-n-z/] for information about the DCL **REPLY** command.

To restart ACMS, use the **ACMS/START SYSTEM** command. To restart applications, use the **ACMS/START APPLICATION** command after the **ACMS/START SYSTEM** command.
To restart a queue, specify the **ACMS/START SYSTEM** command with the **/QTI** qualifier or **ACMS/START QUEUE** command.

Example

```
$ ACMS/STOP SYSTEM/CANCEL
```

This command cancels any active tasks and stops all applications, the TSC, the QTI, and the ACMS software.

ACMS/STOP TERMINALS Command

ACMS/STOP TERMINALS Command — Stops the TSC, thereby canceling the tasks of all ACMS menu users and signing out all current menu users.

Format

ACMS/STOP TERMINALS

Privileges Required

OpenVMS OPER privilege.

Notes

Use the **ACMS/STOP TERMINALS** command to prevent users from signing in or to stop all ACMS task activity.

Because the **ACMS/STOP TERMINALS** command cancels active tasks and signs users out of ACMS, use the DCL **REPLY** command to ask users to finish tasks before entering this command. See the *VSI*

OpenVMS DCL Dictionary: N–Z [https://docs.vmssoftware.com/vsi-openvms-dcl-dictionary-n-z/] for information about the DCL **REPLY** command.

To restart the TSC, specify the **ACMS/START TERMINALS** command

Example

```
$ ACMS/STOP TERMINALS
```

This command cancels active tasks and stops the TSC. Users cannot sign in to ACMS.

Chapter 22. ACMSGEN Commands

This chapter contains reference information and examples for the ACMSGEN Utility commands. See *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"* for general information on the ACMSGEN Utility. It is recommended that you change ACMSGEN-generated parameters with the ACMSPARAM.COM command procedure. See *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"* for information about the ACMSPARAM.COM command procedure.

EXIT Command (ACMSGEN>)

EXIT Command (ACMSGEN>) — Ends the ACMSGEN session and returns you to the DCL prompt.

Format

EXIT

Privileges Required

None.

Notes

You can also end an ACMSGEN session by pressing **Ctrl/Z**. **Ctrl/Z** signals the end of the file for data entered from the terminal. **Ctrl/Z** is displayed as **EXIT**.

ACMSGEN does not automatically write your changes to the ACMSGEN work area when you exit.

Example

```
ACMSGEN> EXIT
$
```

This command ends the ACMSGEN session and returns you to the DCL prompt.

HELP Command (ACMSGEN>)

HELP Command (ACMSGEN>) — Displays information about ACMSGEN commands and qualifiers.

Format

HELP [*topic* [...]]

Privileges Required

None.

Parameters

topic

The command or topic you want to know about. If you do not supply a topic, **HELP** provides a list of topics to choose from.

Notes

None.

Example

```
ACMSGEN> HELP USE_CURRENT

USE_CURRENT

  Initializes the work area with current values from the ACMSPAR.ACM
  file.

       Format:

           USE CURRENT

Topic?
```

This command displays help information about the **USE CURRENT** command.

SET Command (ACMSGEN>)

SET Command (ACMSGEN>) — Changes parameter values in the ACMSGEN work area. The parameter changes are not made to any real parameter set until you use the **WRITE** command.

Format

SET *parameter-name value*

Privileges Required

None.

Parameters

parameter-name

The name of the ACMS parameter whose value you are changing. Display the names of parameters by using the **SHOW** command.

value

The new value for the parameter. Enter integer values in decimal numbers. String values can be enclosed in quotation marks.

Notes

None.

Examples

1. ```
   ACMSGEN> SET CP_SLOTS 5
   ACMSGEN> SET MAX_LOGINS 25
   ACMSGEN> WRITE CURRENT
   ```

   These commands increase the number of users who can sign in by increasing the values of the CP_SLOTS and MAX_LOGINS parameters. The first **SET** command places 5 in the work area as the value for CP_SLOTS. The second **SET** command places 25 in the work area as the value for MAX_LOGINS. The **WRITE CURRENT** command writes values from the work area to the SYS$SYSTEM:ACMSPAR.ACM file.

2. ```
   ACMSGEN> USE WORK
   ACMSGEN> SET CP_USERNAME ACMS$CP
   ACMSGEN> WRITE CURRENT
   ```

   These commands change the current user name of the Command Process (CP) to ACMS$CP and update the current values for other parameters with values from the work file, WORK.ACM. The **USE** command initializes the work area with values from the work file. The **SET** command changes the value of CP_USERNAME to **ACMS$CP**. The **WRITE ACTIVE** command copies the values for current parameters from the work area to the global section for current values.

SHOW Command (ACMSGEN>)

SHOW Command (ACMSGEN>) — Displays the value in the work area, the default value, the minimum value, the maximum value, the unit of measure, and the dynamic/fixed status for ACMS system parameters.

Format

SHOW { *parameter-name* / */qualifier*[...] }

Command Qualifiers	Defaults
/ACC	None
/ALL	None
/CP	None
/EXC	None
/MSS	None
/QTI	None
/TSC	None

Privileges Required

None.

Parameters

parameter-name

The name of a parameter that you want to display information about. You must supply a parameter name or you receive an error.

Qualifiers

/ACC

Displays information only for the parameters that affect the ACMS Central Controller (ACC).

/ALL

Displays information for all parameters values.

/CP

Displays information only for the parameters that affect the ACMS Command Process.

/EXC

Displays information only for the parameters that affect the ACMS Application Execution Controller.

/MSS

Displays information only for the parameters that affect the ACMS message switch subsystem.

/QTI

Displays information only for the parameter values that affect the ACMS Queued Task Initiator (QTI).

/TSC

Displays information only for the parameters that affect the Terminal Subsystem Controller (TSC).

Notes

If you specify a qualifier, it overrides the parameter name.

The dynamic/fixed status indicates whether or not you can change the active value for a parameter. You can change the active or current values of dynamic parameters. You can change only the current values of fixed parameters.

Examples

1.
```
ACMSGEN> SHOW MAX_TTS_CP
MAX_TTS_CP      20        20        0        -1        te
```

   For the MAX_TTS_CP parameter, this command displays:

   - Value in the work area
   - Default value

- Minimum value
- Maximum value (–1 indicates infinity)
- Unit of measure
- Dynamic/fixed status

2. ACMSGEN> **SHOW/TSC**

```
Parameters in use:  CURRENT
Parameter Name  Current    Default Minimum  Maximum  Unit     Dynamic
--------------  -------    ------- -------  -------  ----     -------
MAX_LOGINS      60         60      0        -1       submitters    D
MAX_TTS_CP      20         20      0        -1       terminals     D
PERM_CPS        1          1       0        -1       command prcs  D
CP_SLOTS        3          3       0        -1       command prcs  D
MIN_CPIS        2          2       0        -1       CP threads    D
TSC_USERNAME    ACMSSYSTEM SYSTEM                    VMS username
TSC_PRIORITY    6          4       0        31       VMS priority
```

   This command displays information for parameters that affect the TSC, including the values now in the work area.

3. ACMSGEN> **USE ACTIVE**
   ACMSGEN> **SHOW/ALL**

   The **USE ACTIVE** command places active values for all parameters into the work area. The **SHOW** command displays information for all parameters, including the active values in the work area.

4. ACMSGEN> **USE WORK**
   ACMSGEN> **SHOW/TSC**

   The **USE** command initializes the work area with values from the file SYS$SYSTEM:WORK.ACM. The **SHOW** command displays information about parameters affecting the TSC, including their work file values from the work area.

USE Command (ACMSGEN>)

USE Command (ACMSGEN>) — Initializes the ACMSGEN work area with values from a work file.

Format

USE *file-spec*

Privileges Required

None.

Parameters

file-spec

The file specification of the parameter file you created with the **WRITE** command. SYS$SYSTEM is the default device and directory for the file. The default file type is .ACM.

Notes

If the work area does not contain work file values, initialize the work area with the **USE** command before performing any operation (such as display or update) with values from a work file.

Examples

1. ```
   ACMSGEN> USE WORK
   ACMSGEN> WRITE ACTIVE
   ```

   These commands update the active values for dynamic parameters with values from a work file, WORK.ACM. The **USE** command initializes the work area with values from the work file. The **WRITE ACTIVE** command copies values for dynamic parameters from the work area to the global section for active values.

2. ```
   ACMSGEN> USE WORK
   ACMSGEN> WRITE CURRENT
   ```

   These commands update current values with values from the work file WORK.ACM. The WORK.ACM file contains values from an earlier ACMSGEN session. The **USE** command initializes the work area with values from the WORK.ACM file. The **WRITE CURRENT** command copies values from the ACMSGEN work area to the SYS$SYSTEM:ACMSPAR.ACM file.

USE ACTIVE Command (ACMSGEN>)

USE ACTIVE Command (ACMSGEN>) — Initializes the ACMSGEN work area with active values for all parameters from an ACMS system global section.

Format

USE ACTIVE

Privileges Required

None.

Notes

Active values are used by an active ACMS system. ACMS keeps active values in a system global section. The global section can receive active values in two ways:

- When you use a **WRITE ACTIVE** command, ACMS writes values from the work area to the global section.
- When you use an **ACMS START /SYSTEM** command from the DCL prompt, ACMS copies values from the SYS$SYSTEM:ACMSPAR.ACM file to the global section.

If the work area does not contain active values, initialize the work area with the **USE ACTIVE** command before performing any operation, such as display or update, with active values.

If the ACMS system is inactive when you use the **USE ACTIVE** command, you receive an error message. Values in the work area do not change.

Examples

1. ```
   ACMSGEN> USE ACTIVE
   ACMSGEN> WRITE WORK
   ```

   These commands place a copy of the active values for all parameters in the work file, SYS$SYSTEM:WORK.ACM. The **USE ACTIVE** command initializes the work area with active values for all parameters. The **WRITE** command copies all values in the work area to the work file.

2. ```
   ACMSGEN> USE ACTIVE
   ACMSGEN> SET MIN_CPIS 2
   ACMSGEN> WRITE ACTIVE
   ```

   These commands change the active value for MIN_CPIS to 2. The **USE ACTIVE** command initializes the work area with active values for all parameters. The **SET** command places 2 in the work area as the value for MIN_CPIS. The **WRITE ACTIVE** command copies the values for dynamic parameters from the work area to the global section for active values.

3. ```
   ACMSGEN> USE ACTIVE
   ACMSGEN> WRITE CURRENT
   ```

   These commands use active values to update current values for dynamic parameters. The **USE ACTIVE** command initializes the work area with active values for all parameters. The **WRITE CURRENT** command copies the values from the work area to the SYS$SYSTEM:ACMSPAR.ACM file as new current values.

USE CURRENT Command (ACMSGEN>)

USE CURRENT Command (ACMSGEN>) — Initializes the ACMSGEN work area with current values for all parameters from the SYS$SYSTEM:ACMSPAR.ACM parameter file.

Format

USE CURRENT

Privileges Required

None.

Notes

Current values are the values used to initialize ACMS. By default, ACMSGEN initializes the ACMSGEN work area with current values. Often you can display or update current values without initializing the work area explicitly.

Examples

1. ```
   ACMSGEN> USE CURRENT
   ACMSGEN> SET PERM_CPS 2
   ACMSGEN> WRITE CURRENT
   ```

   These commands change the current value for PERM_CPS to 2. The **USE CURRENT** command initializes the work area with current values. The **SET** command places 2 in the work area

as the value for PERM_CPS. The **WRITE CURRENT** command updates the values in the SYS$SYSTEM:ACMSPAR.ACM file with values from the work area.

2. ACMSGEN> **USE CURRENT**
   ACMSGEN> **WRITE WORK**

   The **USE CURRENT** command initializes the work area with current values. The **WRITE** command copies values from the work area to the work file, SYS$SYSTEM:WORK.ACM.

3. ACMSGEN> **USE CURRENT**
   ACMSGEN> **WRITE ACTIVE**

   These commands use current values to update the active values of dynamic parameters. Recent changes to current values can take effect immediately for some parameters. The **USE CURRENT** command initializes the work area with current values for all parameters. The **WRITE ACTIVE** command copies values for dynamic parameters from the work area to the global section for active values.

USE DEFAULT Command (ACMSGEN>)

USE DEFAULT Command (ACMSGEN>) — Initializes the ACMSGEN work area with ACMS default values for all ACMS parameters.

Format

USE DEFAULT

Privileges Required

None.

Notes

If the work area does not contain default values, initialize the work area with the **USE DEFAULT** command before performing any operation, except display, with ACMS default values. You cannot change values in the default list.

For a list of the default values for ACMSGEN parameters, see *Table 11.3, "ACMSGEN Parameter Values"*.

Examples

1. ACMSGEN> **USE DEFAULT**
   ACMSGEN> **WRITE ACTIVE**

   These commands reset the active values for dynamic parameters to ACMS default values. The **USE DEFAULT** command initializes the work area with ACMS default values. The **WRITE ACTIVE** command writes values for dynamic parameters from the work area to the global section for active values.

2. ACMSGEN> **USE DEFAULT**
   ACMSGEN> **WRITE CURRENT**

These commands reset current values to ACMS default values. The **USE DEFAULT** command initializes the work area with ACMS default values. The **WRITE CURRENT** command writes values from the work area to the SYS$SYSTEM:ACMSPAR.ACM file as current values for all ACMS parameters.

WRITE Command (ACMSGEN>)

WRITE Command (ACMSGEN>) — Writes values from the ACMSGEN work area to a work file, creating a new version of the file.

Format

WRITE *file-spec*

Privileges Required

None.

Parameters

file-spec

The file specification of the work file where you want ACMSGEN to write the parameter work area. The file specification cannot be an existing version of a file. SYS$SYSTEM is the default device and directory. The default file type is .ACM. There is no default file name.

Notes

Use the **SHOW** command to check that the work area contains the appropriate values before using the **WRITE** command.

Example

1. ```
   ACMSGEN> WRITE WORK
   ```

   This command writes values from the ACMSGEN work area to the work file SYS$SYSTEM:WORK.ACM, creating a new version of the file.

2. ```
   ACMSGEN> USE ACTIVE
   ACMSGEN> WRITE WORK
   ```

   These commands copy active values for dynamic parameters to a work file. The **USE ACTIVE** command initializes the work area with active values for all parameters. The **WRITE** command writes values from the work area to the WORK.ACM work file, creating a new version of the file.

WRITE ACTIVE Command (ACMSGEN>)

WRITE ACTIVE Command (ACMSGEN>) — Changes active values for dynamic parameters by writing values from the ACMSGEN work area to an ACMS system global section.

Format

WRITE ACTIVE

Privileges Required

OpenVMS OPER privilege.

Notes

The **WRITE ACTIVE** command updates active values for any of the following parameters:

- MAX_LOGINS
- MAX_TTS_CP
- MIN_CPIS
- MSS_NET_RETRY_TIMER
- PERM_CPS
- QTI_POLLING_TIMER
- QTI_SUB_TIMEOUT
- QTI_RETRY_TIMER
- USERNAME_DEFAULT

For other parameters, you can change current values only.

Use the **SHOW** command to check that the work area contains the appropriate values before using the **WRITE ACTIVE** command. New active values last until the system stops or until you change them again. If the system is inactive when you use the **WRITE ACTIVE** command, you receive an error message, and no changes are made.

Examples

1. ```
   ACMSGEN> USE ACTIVE
   ACMSGEN> SET PERM_CPS 2
   ACMSGEN> WRITE ACTIVE
   ```

   These commands change the active values for PERM_CPS to 2. The **USE ACTIVE** command initializes the work area with active values for all parameters. The **SET** command places 2 in the work area as the value for PERM_CPS. The **WRITE ACTIVE** command writes the values for dynamic parameters from the work area to the system global section containing values for the active system.

2. ```
   ACMSGEN> USE DEFAULT
   ACMSGEN> WRITE ACTIVE
   ```

   These commands reset the active values for dynamic parameters to ACMS default values. The **USE DEFAULT** command initializes the work area with default values for all parameters. The

WRITE ACTIVE command updates active values for dynamic parameters with values from the ACMSGEN work area.

WRITE CURRENT Command (ACMSGEN>)

WRITE CURRENT Command (ACMSGEN>) — Changes current values by writing values from the ACMSGEN work area to the SYS$SYSTEM:ACMSPAR.ACM file.

Format

WRITE CURRENT

Privileges Required

Write access to the SYS$SYSTEM directory. The OpenVMS privilege SYSPRV or a system UIC gives you write access to SYS$SYSTEM.

Notes

Use the **SHOW** command to check that the work area contains the appropriate values before using the **WRITE CURRENT** command.

When you use an ACMS **START /SYSTEM** command, ACMS initializes the global section for active values with values from the ACMSPAR.ACM file.

Examples

1. ```
   ACMSGEN> SET PERM_CPS 3
   ACMSGEN> WRITE CURRENT
   ```

   These commands change the current value of PERM_CPS to 3. By default, the work area contains current values. The **SET** command changes the value for PERM_CPS in the work area to 3. The **WRITE CURRENT** command writes values from the work area to the SYS$SYSTEM:ACMSPAR.ACM file as new current values for ACMS.

2. ```
   ACMSGEN> USE DEFAULT
   ACMSGEN> WRITE CURRENT
   ```

   These commands reset the current values of ACMS to defaults. The **USE DEFAULT** command initializes the work area with default values. The **WRITE CURRENT** command copies values from the work area to the SYS$SYSTEM:ACMSPAR.ACM file as new current values for ACMS.

Chapter 23. ATR Commands

This chapter contains reference information and examples for the ACMS Audit Trail Report (ATR) Utility commands. See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for general information about the ATR Utility.

EXIT Command (ATR>)

EXIT Command (ATR>) — Ends the ATR Utility session and returns you to the DCL prompt.

Format

EXIT

Privileges Required

None.

Notes

You can also end an ATR session with a controlled exit by pressing **Ctrl/Z**. **Ctrl/Z** signals the end of the file for data entered from the terminal. **Ctrl/Z** is displayed as **EXIT**.

Example

```
ATR> EXIT
```

This command ends an ATR Utility session and returns you to the DCL prompt.

HELP Command (ATR>)

HELP Command (ATR>) — Displays information about ATR Utility commands and their qualifiers.

Format

HELP [*topic* [...]]

Privileges Required

None.

Parameters

topic

The ATR topic you want to know about. If you do not specify a topic, ACMS displays a list of topics for you to choose from.

Notes

None.

Example

```
ATR> HELP ERRORS

    Audit/Trace Message Formats


   Additional information available:

   BYNAME  ENDTOOSOON   IDLOGGONE   INVID    NOTYPE    REC_CORRUPT

ERRORS Subtopic?
```

This command displays help information about the audit trail error messages.

LIST Command (ATR>)

LIST Command (ATR>) — Produces a report about information in the audit trail log file. You can limit the amount of information in the report by using qualifiers.

Format

LIST [*file-spec*]

Command Qualifiers	Defaults
/APPLICATION=*application-name*	All application names
/BEFORE[=*time*]	Full report
/BRIEF	Full report
/IDENTIFICATION=*task-id*	All task IDs
/OUTPUT=*file-spec*	/OUTPUT=SYS$OUTPUT
/SINCE[=*time*]	Full report
/SUBMITTER=*submitter-id*	All submitter IDs
/TASK=*task-name*	All task names
/TERMINAL=*device-name*	All device names
/TYPE=*type*	All types
/USERNAME=*user-name*	All user names

Privileges Required

OpenVMS SYSPRV.

Parameters

file-spec

The file specification of the audit trail log file that is used to generate the report. The file specification can be any version of the audit trail log or a concatenated file containing several audit

trail log files. If you do not supply a file specification, the file defined as ACMS$AUDIT_LOG is used. If the ACMS$AUDIT_LOG logical is undefined and you omit the file specification, the default file specification SYS$ERRORLOG:ACMSAUDIT.LOG is used. If you supply only a partial file specification, missing parts are taken from SYS$ERRORLOG:ACMSAUDIT.LOG.

Qualifiers

/APPLICATION=*application-name*

Limits the report to records involving the application you name. Application-name is the file name of an application database.

/BEFORE[=*time*]

Limits the report to records logged before the time you specify. Specify time as an OpenVMS absolute time. If you specify the **/BEFORE** qualifier without a time argument, the default is **/BEFORE=TODAY**. If you do not specify the **/BEFORE** qualifier, a full report is displayed. You can use the **/SINCE** qualifier with the **/BEFORE** qualifier.

/BRIEF

Limits the length of records in the report. Each record in a brief report contains the time of the entry in the audit trail log and the type of information in the entry. For a description of record types, see the description of the **/TYPE** qualifier. If you do not use the **/BRIEF** qualifier, you get a full report.

/IDENTIFICATION=*task-id*

Limits the report to records generated by the specified task ID. The task ID is the unique identification code ACMS assigns to an active task. See *Section 12.6.1, "Selecting Records by Submitter and Task Identification Code"* for a description of the task ID format and how to specify a task ID.

/OUTPUT=*file-spec*

Writes an ACMS Log Report to the output file you name. Output goes to SYS$OUTPUT by default.

/SINCE[=*time*]

Limits the report to records logged after the time you specify. Specify the time as an OpenVMS absolute time. If you specify the **/SINCE** qualifier without the time argument, the default is **/SINCE=TODAY**. If you do not specify the **/SINCE** qualifier, the default is a full report. You can use the **/SINCE** qualifier with the **/BEFORE** qualifier.

/SUBMITTER=*submitter-id*

Limits the report to records generated by the specified submitter ID. The submitter ID is the unique task submitter code ACMS assigns to an ACMS user at sign-in. The submitter ID begins with the name of the node on which the user signed in. You can omit leading zeros in the submitter ID. See *Section 12.6.1, "Selecting Records by Submitter and Task Identification Code"* in *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for a description of the submitter ID format and of how to specify a submitter ID.

/TASK=*task-name*

Limits the report to records that match the task name you specify. The task name is the name defined in the application definition.

/TERMINAL=*device-name*

Limits the report to records of sign-ins and sign-outs from the specified terminal. Device-name is the name of a terminal that runs ACMS tasks. You must end the device name with a colon (:).

/TYPE=*type*

Limits the report to records of one type. The possible types of reports are:

- ALL – generates a report on all records. ALL is the default.
- COMMAND – generates a report on ACMS operator commands.
- ERROR – generates a report on errors.
- LOGIN – generates a report on all sign-ins and sign-outs.
- OTHER – generates a report that tells you when the Audit Trail Logger is enabled or disabled, opened or closed, and logs each use of the **ACMS/RESET AUDIT** command.
- TASK – generates a report on task information, excluding errors.

/USERNAME=*user-name*

Limits the report to records generated by the specified user name.

Notes

If you use the **LIST** command without qualifiers, the ATR report includes all records in the input file.

Press the PF1 and PF2 keypad keys for access to a keypad of ATR commands. Press **Ctrl/B** to recall each ATR command you enter.

When you use ATR to read information from the latest version of the audit trail log while the Audit Trail Logger is active, audit trail information may be a few seconds behind ACMS activity. Records are forced out to the audit trail log file based on both the number of records that have been written since the last forced write, and the time elapsed since the last request was responded to.

Examples

1. ATR> **LIST/SINCE=09-MAR-1994 9:00/BEFORE=09-MAR-1994 10:00**

   This command displays all records written between 9 and 10 a.m. on March 9, 1994.

2. ATR> **LIST/APPLICATION=TEST/OUTPUT=AUDITRPT.LIS**

   This command writes records for the application TEST to the output file AUDITRPT.LIS.

3. ATR> **LIST/BRIEF**

   This command displays partial records, including the time of each entry and the type of information recorded.

4. ATR> **LIST/IDENTIFIER=-1**

This command lets you see the first task selection for each submitter. You specify only the sequence number on the **/IDENTIFIER** qualifier. Because you omit the local ID field, you indicate that you are omitting that field by using a dash.

5. ATR> **LIST/TASK=UPDATE/OUTPUT=AUDITRPT.LIS**

   This command writes records for the Update task to the listing file AUDITRPT.LIS.

6. ATR> **LIST/TERMINAL=TTA5:**

   This command displays all sign-ins and sign-outs from terminal TTA5.

7. ATR> **LIST/TYPE=COMMAND**

   This command displays all instances of operator command usage.

8. ATR> **LIST/TYPE=ERROR**

   This command displays records of errors.

9. ATR> **LIST/TYPE=LOGIN**

   This command displays sign-ins and sign-outs for all users on an ACMS system.

10. ATR> **LIST/TYPE=TASK**

    This command displays all records involving tasks.

11. ATR> **LIST/TYPE=OTHER**

    This command displays records of when the audit trail log is opened and closed, when the Audit Trail Logger is enabled and disabled, and when the audit trail log is renewed with the **ACMS/RESET AUDIT** command.

12. ATR> **LIST/USERNAME=CONNOR**

    This command displays records for a user or users signed in under the user name CONNOR.

Chapter 24. SWLUP Commands

This chapter contains reference information and examples for the ACMS Software Event Log Utility Program (SWLUP) commands. See *Chapter 13, "Logging Software Events"* for general information about SWLUP.

@ (At sign) Command (SWLUP>)

@ (At sign) Command (SWLUP>) — Runs an indirect command file that contains SWLUP commands.

Format

@ *file-spec*

Privileges Required

None.

Parameters

file-spec

The name of a command file for SWLUP to run. Use a standard OpenVMS file specification. If you do not include the directory in the file specification, SWLUP searches your current directory by default. SWLUP uses SYS$DISK:[].COM as the default file type.

Notes

SWLUP runs all commands stored in the command file you specify. SWLUP sends your reports to the default output device SYS$OUTPUT.

You must use the **SET VERIFY** command before SWLUP can display commands in the indirect command file. Errors are reported on SYS$OUTPUT and on SYS$ERROR if SYS$ERROR is different from SYS$OUTPUT.

Example

```
SWLUP> @REPORT
```

SWLUP runs the file REPORT.COM, which contains the commands to list all today's events.

EDIT Command (SWLUP>)

EDIT Command (SWLUP>) — Lets you edit the last SWLUP command you entered and lets you create an edit buffer into which you can enter SWLUP commands.

Format

EDIT

Privileges Required

None.

Notes

You can use the **EDIT** command in two ways:

- Within SWLUP, you can type the **EDIT** command after you type a SWLUP command (such as **SET LOG**, **SET NOVERIFY**). SWLUP places the command in the edit buffer. You can correct or change the SWLUP command using a text editor.
- You can type the **EDIT** command at the SWLUP> prompt. SWLUP then provides an edit file into which you can enter SWLUP commands with a text editor.

When you exit the editor, SWLUP runs the commands in the file and returns to the SWLUP> prompt. If you exit the editor without creating an output file, SWLUP prints the error message %SWLUP-E-ERREDIT, does not try to run the last command, and returns to the SWLUP> prompt.

The ACMS system startup file, ACMSTART.COM defines the system logical SWLUP$EDIT to be ACMS$EDIT. As system manager, you can define ACMS$EDIT to be TDMSEDIT.COM (which runs the TDMS text editor), ACMSEDIT.COM (which runs the EDT text editor), or a personal command procedure that invokes another text editor or a particular set of editor startup commands. When you issue the **EDIT** command, ACMS executes the command file pointed to by ACMS$EDIT.

Examples

1. ```
   SWLUP> EDIT
   LIST /PROCESS_NAME=JACK_SMITH
   Ctrl/Z
   DBA0:[SMITH]SWLUP_C20205018.COM;1 1 LINE
   SWLUP>
   ```

   The **EDIT** command typed at the SWLUP> prompt displays an edit buffer into which you can enter the SWLUP commands.

2. ```
   SWLUP> SET NOLOG
   SWLUP> SET VERIFY
   SWLUP> EDIT
   SET VERIFY
   Ctrl/Z
   DBA0:[SMITH]SWLUP_C_C20203098.COM;2 1 LINE
   SWLUP>
   ```

   If you enter SWLUP commands and type the **EDIT** command at the SWLUP prompt, the last command you entered is placed in the edit buffer.

EXIT Command (SWLUP>)

EXIT Command (SWLUP>) — Causes SWLUP to exit or ends the execution of a command file.

Format

EXIT

Privileges Required

None.

Notes

SWLUP exits from either the utility or a command file. You can also end a SWLUP session by pressing **Ctrl/Z**. **Ctrl/Z** signals the end of the file for data entered from the terminal. **Ctrl/Z** is displayed as **EXIT**.

Examples

1. SWLUP> **EXIT**
   $

   The **EXIT** command ends the SWLUP session and returns control to the DCL prompt.

2. SWLUP> **@LISTIT**
   SET LOG !These lines are in the file LISTIT.COM
   SET VERIFY
   EXIT

   This command ends the processing of commands from an indirect command file and returns to the SWLUP> prompt.

HELP Command (SWLUP>)

HELP Command (SWLUP>) — Displays information about SWLUP commands and qualifiers.

Format

HELP [*topic* [...]]

Command Qualifiers	Defaults
/[NO]PROMPT	/PROMPT

Privileges Required

None.

Parameters

topic

The SWLUP command or topic that you want to display information about. If you use the **HELP** command without a topic, help provides a list of topics to choose from.

Qualifiers

/[NO]PROMPT

Determines whether or not SWLUP displays help information and then displays a prompt for a topic or subtopic. The **/PROMPT** qualifier is the default.

Notes

None.

Example

```
SWLUP> HELP SET

SET
   Determines if commands are logged to a file or whether commands from an
   indirect command file are printed to the default output device.

   Format:

        SET [NO]LOG
        SET [NO]VERIFY

 Additional information available:

 [NO]LOG     [NO]VERIFY

SET Subtopic?
```

Type **HELP** followed by the **SET** command to get information about **SET [NO]LOG** and **SET [NO]VERIFY**. If you type either **[NO]LOG** or **[NO]VERIFY** at the `SET Subtopic?` prompt, SWLUP displays information about the qualifier you requested.

LIST Command (SWLUP>)

LIST Command (SWLUP>) — Lists information selected by command qualifiers.

Format

LIST [EVENTS]

Command Qualifiers	Defaults
/BEFORE[=*time*]	Full report
/EVENT_CODE=*event-code*[,...]	All event codes
/FACILITY=*facility-name*[,...]	All facilities
/IMAGE=*image-name*[,...]	All images
/INPUT=*file-spec*	/INPUT=SYS$ERRORLOG:SWL.LOG
/OUTPUT=*file-spec*	/OUTPUT=SYS$OUTPUT
/PRINT	Does not print
/PROCESS_NAME=*process-name*[,...]	All processes
/SEVERITY=*severity-code*[,...]	All severity codes
/SINCE[=*time*]	Full report
/USER=*user-name*[,...]	All user names

Privileges Required

None.

Qualifiers

/BEFORE[=*time*]

Lists only those events dated before the time you name. This qualifier and the **/SINCE** qualifier let you select a range of time. You need not use the qualifiers together. The format for date and time is dd-mmm-yyyy:hh:mm, which allows you to omit any of the trailing fields. You can also use the keywords TODAY or YESTERDAY to specify a time. The default is **/BEFORE=TODAY**. If you specify a date without a time, the time defaults to 00:00.00 for the date you specify.

/EVENT_CODE=*event-code*[,...]

Selects events by return status code. For example, you can list all ACMSI-F-BUGLOG errors by typing **/EVENT=BUGLOG** or **/EVENT=(BUGLOG)** . Logging all events to the current log file is the default.

/FACILITY=*facility-name*[,...]

Selects a list of events logged by one or more facility names you specify. The only facilities that log events in the Software Event Log are ACMS and SWL. ACMS software errors are logged under the name ACMSI. Logging all events to the current log file is the default.

/IMAGE=*image-name*[,...]

Selects the events associated with one or more image names you specify. Logging all events to the current log file is the default. If you specify only part of an image name, SWLUP lists all images whose names contain the specified characters.

/INPUT=*file-spec*

Names the input log file you want to read. If you do not use the **/INPUT** qualifier, SWLUP uses SYS$ERRORLOG:SWL.LOG by default.

/OUTPUT=*file-spec*

Stores SWLUP output in a file you specify. If you do not use the **/OUTPUT** qualifier, SWLUP sends output to the default output device SYS$OUTPUT.

/PRINT

Prints a listing file on the system printer. If you do not use the **/OUTPUT** qualifier with the **/PRINT** qualifier, SWLUP creates a temporary listing file (SWLUPLIS.LIS) and deletes it after the file is printed. If you do not specify the **/PRINT** qualifier, the file is not printed.

/PROCESS_NAME=*process-name*[,...]

Selects all events logged with one or more process names you specify. Logging all events to the current log file is the default.

/SEVERITY=*severity-code*[,...]

Selects the events for a SWLUP report by the OpenVMS severity code. You can use complete severity code names or abbreviate them to the first character:

- Success
- Informational
- Warning
- Error
- Fatal

Logging all events to the current log file is the default.

/SINCE[=*time*]

Identifies only those events dated after the date and time you specify. This qualifier and the **/BEFORE** qualifier let you define a range of time for the events logged. The format for time is dd-mmm-yyyy:hh:mm. You can also specify the keywords TODAY or YESTERDAY. If you specify any part of the date, you must specify the full date. You can omit the time field. The default is **/SINCE=TODAY**.

/USER=*user-name*[,...]

Selects all events logged with one or more user names. Logging all events in the current log file is the default.

Notes

ACMS logs ACMS internal software errors and some SWL events of varying severity. For example, you might want to look at just the ACMS errors. By using this command, you can create a file of just those errors.

Examples

1. `SWLUP> LIST/USER=RICH`

   This command lists all events in the log file associated with the user name RICH.

2. `SWLUP> LIST EVENTS/FACILITY=TSS/SEVERITY=F/BEFORE=09-APR-1994`

   This command lists all events in the log file that are ACMS events, with an F severity code, logged before April 9, 1994.

3. `SWLUP> LIST/PROCESS_NAME=CPPROC/OUTPUT=SEPT21.LOG`

   This command lists all events in the log file associated with the process name CPPROC and places them in the output file SEPT21.LOG.

RENEW Command (SWLUP>)

RENEW Command (SWLUP>) — Starts a new systemwide SWL log file.

Format

RENEW

Privileges Required

Write access to the new log file and the OpenVMS privileges TMPMBX and SYSPRV.

Notes

The **RENEW** command closes the current log file and creates a new version. The log file is called SYS$ERRORLOG:SWL.LOG.

If an SWL log file is not already opened and you use the **RENEW** command, you receive an error. You can determine whether SWL is currently logging information to a log file by using the **SHOW LOG** command.

Example

```
SWLUP> RENEW
```

Creates a new version of SYS$ERRORLOG:SWL.LOG to log subsequent events.

SAVE Command (SWLUP>)

SAVE Command (SWLUP>) — Writes to a file the last command you typed.

Format

SAVE *file-spec*

Privileges Required

None.

Parameters

file-spec

The name of the file in which you want to save the last command. If you supply an incomplete file specification, the default disk is SYS$DISK; the default directory is your current directory; and the default file type is .SAV.

Notes

If the command you save is @file-spec, the contents of the file specification are also available in the target file.

Example

```
SWLUP> LIST/SEVERITY=S
SWLUP> SAVE
SAVE TO FILE:KEEPIT
previous command SAVEd to file DBA0:[SMITH]KEEPIT.SAV
SWLUP>
```

Type or print the file KEEPIT.SAV to see the command you entered with the **SAVE** command.

SET [NO]LOG Command (SWLUP>)

SET [NO]LOG Command (SWLUP>) — Enables or disables creation of a log file that records your SWLUP session.

Format

SET LOG [*file-spec*]

SET NOLOG

Privileges Required

None.

Parameters

file-spec

The file specification of the log file. If you do not specify a file specification, SWLUP creates a new version of the current log file. If a current log file does not exist, SWLUP stores the information in the file SYS$DISK:[]SWLUPLOG.LOG.

Notes

If you do not specify a file specification and a file was previously activated by the **SET LOG** command, SWLUP issues a warning message. If you specify a file that contains a version number and that file already exists, SWLUP stores all new information in that file.

The **SET LOG** and **SET NOLOG** commands are valid only within the current session. Once you exit from SWLUP, all **SET [NO]LOG** commands are deleted.

If you use **SET NOLOG**, SWLUP does not create a file.

Examples

1. SWLUP> **SET LOG**

   SWLUP automatically enables logging of all commands you enter in the session to the SWLUPLOG.LOG file or to the logical translation of SWLUPLOG.

2. SWLUP> **SET LOG SEPT21.LOG**

   This command enables logging to the SEPT21.LOG file.

SET [NO]VERIFY Command (SWLUP>)

SET [NO]VERIFY Command (SWLUP>) — Enables or disables the printing of commands stored in an indirect command file. SWLUP sends output to the default output device SYS$OUTPUT.

Format

SET [NO]VERIFY

Privileges Required

None.

Note

The default is **SET NOVERIFY**. To display the commands from an indirect command file to the default output device, SYS$OUTPUT, use the **SET VERIFY** command.

Examples

1. ```
   SWLUP> SET VERIFY
   SWLUP> @FIRSTLOG
   ```

   This command places SWLUP in verify mode. When you pass the command file FIRSTLOG.COM to SWLUP, it displays the commands it runs from that file.

2. ```
   SWLUP> SET NOVERIFY
   SWLUP> @FIRSTLOG
   ```

   This command places SWLUP in noverify mode. When you pass the command file FIRSTLOG.COM to SWLUP, it does not display the commands it runs from that file.

SHOW CURRENT Command (SWLUP>)

SHOW CURRENT Command (SWLUP>) — Displays the name of the current log file opened by the SWL detached process.

Format

SHOW CURRENT

Privileges Required

OpenVMS TMPMBX privilege.

Notes

SWLUP displays the name of the current log file on SYS$OUTPUT.

Example

```
SWLUP> SHOW CURRENT
%ACMSSWL-S-CURLOGFIL, Current log file: SYS$ERRORLOG:SWL.LOG;1
```

This command displays the name of the current log file.

SHOW LOG Command (SWLUP>)

SHOW LOG Command (SWLUP>) — Displays whether or not you are currently logging SWLUP commands and the name of the log file.

Format

SHOW LOG

Privileges Required

None.

Notes

SWLUP displays the following information:

- The current SWLUP mode: logging or not logging.
- The name of the file to which SWLUP is logging or not logging information. The default is **NOLOG**.

Example

```
SWLUP> SHOW LOG
not logging to file SWLUPLOG.LOG
```

The **SHOW LOG** command shows you that SWLUP is not logging to the default file.

SHOW VERSION Command (SWLUP>)

SHOW VERSION Command (SWLUP>) — Displays the current version of SWLUP on the default output device SYS$OUTPUT.

Format

SHOW VERSION

Privileges Required

None.

Notes

None.

Example

```
SWLUP> SHOW VERSION
ACMS SWLUP V4.0
```

This command displays the SWLUP version number.

STOP Command (SWLUP>)

STOP Command (SWLUP>) — Stops the SWL detached process so that it can exit properly.

Format

STOP

Privileges Required

OpenVMS TMPMBX and SYSPRV privileges.

Notes

None.

Example

```
SWLUP> STOP
```

This command stops the SWL detached process.

Appendix A. Parameter and Quota Calculations

Parameter and quota values needed to run the ACMS software are set by default or by the use of the ACMSPARAM.COM and ACMEXCPAR.COM command procedures. In some instances, you may want to further tune your system by altering those calculations.

The formulas in this appendix show how these recommended minimum settings are derived, and how to alter these calculations to reflect your specific system. The values shown in this appendix are guidelines.

If you change the calculations for any parameter, edit the ACMVARINI.DAT file to change the appropriate variable value corresponding to that parameter. The command procedure uses the changed variable value to calculate not only the parameter that you wish to recalculate, but any related parameters or quotas. Note, however, that ACMSPARAM.COM raises but does not lower a process quota or SYSGEN parameter based on your recalculations. The command procedure will raise or lower any other parameters as indicated by your recalculations.

Note

ACMSPARAM.COM and ACMEXCPAR.COM do not support logical name search lists for the TDB file specifications.

The parameter and quota calculations described in this appendix are:

- OpenVMS SYSGEN parameters affected by ACMS
- Quotas for OpenVMS user names of ACMS processes, specifically:
  - OpenVMS user name under which the ACMS Central Controller (ACC) runs
  - OpenVMS user name under which the Terminal Subsystem Controller (TSC) runs
  - OpenVMS user name under which the Command Process (CP) runs
  - OpenVMS user name under which the Application Execution Controller (EXC) runs
  - OpenVMS user name under which the Queued Task Initiator (QTI) runs
  - Quotas and privileges required for ACMS server processes
- Quotas required for users of ADU
- Quotas required for users of the task debugger
- The following ACMSGEN parameters:
  - MAX_LOGINS
  - MSS_MAXOBJ
  - MSS_MAXBUF
  - MSS_POOLSIZE

- MSS_PROCESS_POOL
- PERM_CPS
- TWS_POOLSIZE
- TWSC_POOLSIZE
- WS_POOLSIZE
- WSC_POOLSIZE

The following sections contain the formula calculations used by ACMSPARAM.COM.

The formulas for SYSGEN parameters and for quotas needed for OpenVMS user names, ADU, and the task debugger use the variables discussed in *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"*. Refer to *Table 10.3, "Variables Required for ACMSPARAM.COM"* and *Table 10.5, "Variables Required for ACMEXCPAR.COM"* for descriptions of the variables. See *Chapter 11, "Changing ACMS Parameter Values with the ACMSGEN Utility"* for descriptions of the ACMSGEN parameters whose formula calculations are listed here.

A.1. Calculating OpenVMS SYSGEN Parameters Affected by ACMS

ACMSPARAM.COM calculates values for OpenVMS system parameters that are affected by ACMS. The following subsections show how ACMSPARAM.COM determines the values for those OpenVMS SYSGEN parameters. Any time you install additional images you must adjust the SYSGEN parameters. Refer to *Table 10.3, "Variables Required for ACMSPARAM.COM"* for descriptions of the variables shown in these calculations.

A.1.1. Calculating the Value of CHANNELCNT

```
CHANNELCNT = (MAX
                  20 + ((2 * CONTROLLED_TERMINAL_CNT) +
                   ENTERED_TERMINAL_CNT),

                   20 + (2 * REMOTE_SUB_CNT) +
                   TDB_CNT + RLB_CNT,

                   23 + (5 * TERMINALS_PER_CP) +
                   FORM_TRACE_FILE_CNT +
                   + FORM_CNT + ESC_RTN_IMAGE_CNT +
                   REMOTE_RLB_CNT +
                   (2 * REMOTE_APPL_CNT)
                   )
      Include 20% for expansion, and then round to next 10:
      CHANNELCNT = (((CHANNELCNT + CHANNELCNT / 5) / 10) + 1) * 10
```

A.1.2. Calculating the Value of GBLPAGES

```
GBLPAGES = BASE +                                  ! GBLPAGES value without
 ACMS
               1506
               MSS_POOLSIZE +
```

```
                (DEBUGGER_CNT * (TWS_POOLSIZE+TWSC_POOLSIZE)) +
                DEBUG_TDB_BLKS +
                (TDB_CNT * (TWS_POOLSIZE+TWSC_POOLSIZE)) +
                TDB_BLKS +
                ADB_BLKS +
                MDB_BLKS

      Include 20% for expansion, and then round to next 100 pages (VAX) or
      100 pagelets (Alpha):

      GBLPAGES = (((GBLPAGES + GBLPAGES/5) / 100 ) + 1) * 100
```

A.1.3. Calculating the Value of GBLPAGFIL

```
GBLPAGFIL = BASE +                                  ! GBLPAGFIL value without
 ACMS
                4 +
                MSS_POOLSIZE +
                (DEBUGGER_CNT * (TWS_POOLSIZE+TWSC_POOLSIZE)) +
                (TDB_CNT * (TWS_POOLSIZE+TWSC_POOLSIZE) )
     Include 20% for expansion, and then round to next 100 pages (VAX) or
     100 pagelets (Alpha):
     GBLPAGFIL = (((GBLPAGFIL + GBLPAGFIL/5) / 100 ) + 1) * 100
```

A.1.4. Calculating the Value of GBLSECTIONS

```
GBLSECTIONS = BASE +                               ! GBLSECTIONS value without
 ACMS
                  44 +
                  (DEBUGGER_CNT * 3) +
                  (TDB_CNT * 3) +
                   APPL_CNT + REMOTE_APPL_CNT +
                   MDB_CNT
     Include 20% for expansion, and then round to next 10 sections:
     GBLSECTIONS = (((GBLSECTIONS + GBLSECTIONS/5) / 10 ) + 1) * 10
```

A.1.5. Calculating the Value of LOCKIDTBL

```
LOCKIDTBL = BASE +                                 ! LOCKIDTBL value without
 ACMS
                100 +
                (CP_PROC_CNT * 4) +
                (RLB_CNT * 4) +
                (DYN_SP_CNT * 4)  +
                (QTI_QUEUES * 3)  +
                (QTI_TASK_THDS * 15)
     Include 20% for expansion, and then round to next 10 table entries:
     LOCKIDTBL = (((LOCKIDTBL + LOCKIDTBL/5) / 10 ) + 1) * 10
VIRTUALPAGECNT = (((PGFLQUOTA +
               ! Use the highest PGFLQUOTA
                 PGFLQUOTA/5) / 10) +1) * 10  ! from among CP, ACC, TSC,
                                               ! QTI, or EXC PGFLQUOTAs
```

A.1.6. Task Debugger Parameters and Values

The following SYSGEN parameters should be set when you use the task debugger:

Parameter	Value
PQL_DASTLM	20
PQL_DDIOLM	20
PQL_DBIOLM	12
PQL_DWSQUOTA	Greater than or equal to the block size of the largest .TDB file
PQL_DWSEXTENT	Greater than or equal to the block size of the largest .TDB file
PQL_MDIOLM	20

A.2. Calculating Quotas for OpenVMS User Names of ACMS Processes

The following sections show how quotas are set for the various user names under which ACMS components run. VSI recommends you use the ACMSPARAM.COM procedure to set the quota values for the ACC, TSC, CP, and QTI. Use the formulas shown here for informational or fine-tuning purposes only.

The user name quotas for the ACC, TSC, CP, and QTI are defined from the values set by the ACMSPARAM.COM procedure. The user names can also be derived from the values set by the ACMSGEN Utility. The user names for the EXC and the server processes, discussed later in this chapter, are derived from the application definition using the ACMEXCPAR.COM procedure.

When updating the accounts for ACC, TSC, CP, EXC, and QTI, a quota is updated only if the calculated quota is larger than the current quota for the account. This is to prevent the possible introduction of quota problems should the account be used for purposes other than running ACMS. ACMSPARAM.COM and ACMEXCPAR.COM do not allow calculated quotas to be lower than VSI suggested default values. For several quotas ACMSPARAM.COM and ACMEXCPAR.COM do not create values. Instead, ACMS takes the quota values from the DEFAULT account in AUTHORIZE. If you lower any DEFAULT account quotas, be aware that problems can occur while starting or running ACMS.

By assigning different user names to the ACC, TSC, CP, and QTI, you can individually set quotas to ensure the best allocation of resources. You can, however, run the ACC, TSC, CP, and QTI under one user name. If you do this, it is best to maximize the values for all ACC, TSC, CP, and QTI quotas. You normally run the EXC under a user name different from that of the ACC, TSC, CP, and QTI. Run the server processes under additional user names as required.

Note

Keep in mind that ACMSPARAM.COM and ACMEXCPAR.COM calculate quotas specifically for the platform on which they are executing, and that appropriate quotas are often very different on different platforms.

A.2.1. User Name Setup for the ACC

The OpenVMS user name under which the ACC runs requires the privilege SETPRV.

The values shown in *Table A.1, "Minimum Quotas for the ACC User Name Process"* determine the minimum quotas necessary for the OpenVMS user name under which the ACC runs. To set this user name, use the ACC_USERNAME parameter with the ACMSPARAM.COM procedure or the ACMSGEN Utility.

If large number of users are signed in by user-written agents or by the QTI, you may need to fine-tune the working set. See *Section A.5.1, "Calculating the Value of MAX_LOGINS"* for details.

Table A.1. Minimum Quotas for the ACC User Name Process

Parameter	Minimum Value (Alpha)	Minimum Value (IA-64)
ASTLM	250	250
BIOLM	150	150
BYTLM	64000	64000
DIOLM	150	150
ENQLM	2000	2000
FILLM	100	100
PGFLQUOTA	50000	50000
TQELM	10	10
WSDEFAULT	2000	2000
WSEXTENT	16384	16384
WSQUOTA	4000	4000

WSEXTENT is usually higher than WSQUOTA to make the most of the OpenVMS dynamic working set size adjustment algorithms. To set reasonable figures, monitor the live system to determine the page fault rate of the ACC process.

Also, because the Audit Trail Logger process runs under the user name of the ACC, that user name must have write access to the audit trail log file.

If you have a large number of users signing in by user-written agents or the QTI, you may need to increase the working set quotas. See *Section A.5.1, "Calculating the Value of MAX_LOGINS"*.

A.2.1.1. How ACMSPARAM.COM Calculates Values for the ACC

This section shows the formulas for how ACMSPARAM.COM calculates parameter values for the ACC. If the calculated values are below the minimum values shown in *Table A.1, "Minimum Quotas for the ACC User Name Process"*, then ACMSPARAM.COM assigns the minimum values.

Refer to *Table 10.3, "Variables Required for ACMSPARAM.COM"* for descriptions of the variables shown in these calculations.

ASTLM

```
ASTLM = 28 +                          ! base
        (4* remote_node_cnt) +        ! DECnet channel i/o
        remote_sub_cnt +              ! for remote authentication
        terminal_cnt +                ! for local authentication
        remote_appl_cnt +             !
        operator_cnt +                !
```

```
        agent_sub_cnt +             !
        qti_submitters              ! for ACMS operator commands
```

BIOLM

```
BIOLM = 20 +                        ! base
        (4 * REMOTE_NODE_CNT)       ! MSS DECnet send/receive QIOs
```

BYTLM

```
BYTLM = 20000 +                     ! base
        (4 * REMOTE_NODE_CNT)
        * MSS_MAXBUF                ! MSS DECnet i/o
```

ENQLM

```
ENQLM = 100 +                       ! base
        agent_sub_cnt +             !
        remote_sub_cnt +            ! for remote authentication
        terminal_cnt +              ! for local authentication
        qti_submitters              !
```

FILLM

```
FILLM = 20 +                        ! base
        MDB_CNT +                   ! MDBs
        APPL_CNT +                  ! local ADBs
        REMOTE_APPL_CNT +           ! remote ADBs
        (2 * REMOTE_NODE_CNT)       ! DECnet channels
```

PGFLQUOTA

```
PGFLQUOTA = 4096 +                  ! base
            MSS_PROCESS_POOL +      ! MSS pool
            (MSS_MAXBUF + (154 *
            (APPL_CNT + REMOTE_APPL_CNT)) +
             (((2 * REMOTE_NODE_CNT / 8) + 1) * 8 * MSS_MAXBUF) +
            512) / 512
```

A.2.2. User Name Setup for the TSC

The OpenVMS user name under which the TSC runs, defined by the ACMSGEN parameter TSC_USERNAME, must have the privilege SETPRV.

The minimum quotas shown in *Table A.2, "Minimum Quotas for the TSC User Name Process"* are necessary for the OpenVMS user name under which the TSC runs.

Table A.2. Minimum Quotas for the TSC User Name Process

Parameter	Minimum Value (Alpha)	Minimum Value (IA-64)
ASTLM	250	250
BIOLM	150	150
BYTLM	64000	64000
DIOLM	150	150
ENQLM	2000	2000

Parameter	Minimum Value (Alpha)	Minimum Value (IA-64)
FILLM	100	100
PGFLQUOTA	50000	50000
TQELM	–	–
WSDEFAULT	2000	2000
WSEXTENT	16384	16384
WSQUOTA	4000	4000

WSEXTENT is usually higher than WSQUOTA to make the most of the OpenVMS dynamic working set size adjustment algorithms. To set reasonable figures, monitor the live system to determine the page fault rate of the TSC process.

A.2.2.1. How ACMSPARAM.COM Calculates Values for the TSC

This section shows the formulas for how ACMSPARAM.COM calculates parameter values for the TSC. If the calculated values are below the minimum values shown in *Table A.2, "Minimum Quotas for the TSC User Name Process"*, then ACMSPARAM.COM assigns the minimum values.

Refer to *Table 10.3, "Variables Required for ACMSPARAM.COM"* for descriptions of the variables shown in these calculations.

ASTLM

```
ASTLM = 24 +                          ! base
        (terminal_cnt * 2)
```

BIOLM

```
BIOLM = 20 +  TERMINAL_CNT            ! base
```

BYTLM

```
BYTLM = 4096 +                        ! base
        (1000 * TERMINAL_CNT)
```

FILLM

```
FILLM = 20 +                          ! base
        TERMINAL_CNT                  ! 1 channel for each terminal
```

PGFLQUOTA

```
PGFLQUOTA = 2048 +                    ! base
            (100 * TERMINAL_CNT) +    ! for each TT overhead
            MSS_PROCESS_POOL          ! MSS pool
```

TQELM

```
TQELM = CP_PROC_CNT +         ENTERED_TERMINAL_CNT
```

A.2.3. User Name Setup for the CP

The OpenVMS user name under which the CP runs must have the SETPRV privilege.

The OpenVMS user name under which the CP runs requires the minimum quotas shown in *Table A.3, "Minimum Quotas for the CP User Name Process"*. The CP user name is controlled by the ACMSGEN parameter CP_USERNAME. The number of terminals per CP is controlled by the ACMSGEN parameter TERMINALS_PER_CP.

Table A.3. Minimum Quotas for the CP User Name Process

Parameter	Minimum Value (Alpha)	Minimum Value (IA-64)
ASTLM	250	250
BIOLM	150	150
BYTLM	64000	64000
DIOLM	150	150
ENQLM	2000	2000
FILLM	100	100
PGFLQUOTA	50000	50000
TQELM	–	–
WSDEFAULT	–	–
WSEXTENT	–	–
WSQUOTA	–	–

WSEXTENT is usually higher than WSQUOTA to make the most of the OpenVMS dynamic working set size adjustment algorithms. To set reasonable figures, monitor the live system to determine the page fault rate of the CP process.

Remember, you must authorize the user name of the CP as an agent in the User Definition Utility (UDU) authorization file ACMSUDF.DAT. See *Chapter 3, "Authorizing Users"* and *Chapter 18, "UDU Commands"* for information about agent authorizations using UDU.

A.2.3.1. How ACMSPARAM.COM Calculates Values for the CP

This section shows the formulas for how ACMSPARAM.COM calculates parameter values for the CP. If the calculated values are below the minimum values shown in *Table A.3, "Minimum Quotas for the CP User Name Process"*, then ACMSPARAM.COM assigns the minimum values.

Refer to *Table 10.3, "Variables Required for ACMSPARAM.COM"* for descriptions of the variables shown in these calculations.

Working Set on Alpha

```
WSDEFAULT  =  2000 + (10*TERMINALS_PER_CP) ! Working set
WSEXTENT =  16384 + (50*TERMINALS_PER_CP)  ! sizes for
WSQUOTA =  4000 + (50*TERMINALS_PER_CP)    ! CP user name
```

Working Set on IA-64

```
WSDEFAULT  =  2000 + (10*TERMINALS_PER_CP) ! Working set
WSEXTENT =  16384 + (50*TERMINALS_PER_CP)  ! sizes for
WSQUOTA =  4000 + (50*TERMINALS_PER_CP)    ! CP user name
```

ASTLM

```
ASTLM = 17 +                                ! base
        (9 * TERMINALS_PER_CP) +            ! DECnet sends
        (2 * REMOTE_APPL_CNT)               ! for DECnet receives
```

BIOLM

```
BIOLM = 28 +                                ! base
        (TERMINALS_PER_CP * 2) +            ! TDMS i/o or MSS DECnet link i/
o
        (2 * REMOTE_APPL_CNT)               ! for MSS DECnet link receives
```

BYTLM

```
BYTLM = 18000 +                             ! base
        (2000 * TERMINALS_PER_CP) +         ! TDMS i/o
        (((2 * REMOTE_APPL_CNT) +           ! MSS sends
        TERMINALS_PER_CP) * MSS_MAXBUF)
```

DIOLM

```
DIOLM = 20 + (2 * TERMINALS_PER_CP)
```

ENQLM

```
ENQLM = 52 + (4 * TERMINALS_PER_CP)
```

FILLM

```
FILLM = 32 +                                ! base + 3 shareable DECforms
 images
        (3 * TERMINALS_PER_CP) +            ! cp opens 3 channels to each
        (2 * REMOTE_APPL_CNT) +             ! terminal. DECnet link channels
        REMOTE_RLB_CNT +                    ! for remote rlbs
        FORM_CNT + ESC_RTN_IMAGE_CNT        ! for DECforms form files
```

PGFLQUOTA

```
PGFLQUOTA =
    16384 +                                 ! Base
    MSS_PROCESS_POOL +                      ! MSS process pool
    ( 2 * MDB_BLK ) +                       ! Menu information
    FORM_BLKS +                             ! Form files
    REMOTE_RLB_BLKS +                       ! Remote TDMS .RLBs
    ( TERMINALS_PER_CP * 500 ) +            ! Per-user overhead
    TERMINALS_PER_CP *                      ! For each user:
     ( ( ( LARGEST_MESSAGE + 512 ) * 2 ) + ! Msg marshaling
         ( LARGEST_MESSAGE * FORM_CNT ) +  ! DECform's data
        LARGEST_MESSAGE ) / 512             ! TDMS data
```

Note

The current formula for calculating the PGFLQUOTA value of the CP account is liberal. The formula assumes that each exchange step involves the sending or receiving of the largest message (see the description of the LARGEST_MESSAGE variable in *Table 10.3, "Variables Required for ACMSPARAM.COM"*).

After executing ACMSPARAM.COM, review the value of CP_PGFLQUOTA. If this value appears to be excessively large, then replace the LARGEST_MESSAGE variable with the average size of workspaces used in exchange steps, or with the size of the workspace most often used in exchange steps.

The formula for calculating the CP_PGFLQUOTA provides only a rough approximation of this quota. To fine-tune your system, calculate the quota for your particular system.

TQELM

```
TQELM = 8 + TERMINALS_PER_CP
```

A.2.4. User Name Setup for the QTI

The OpenVMS user name under which the QTI runs must have OpenVMS SYSPRV and SYSLCK privileges. Define this user name with the ACMSGEN parameter QTI_USERNAME. The user name must be authorized in the UDU authorization file as an agent.

The OpenVMS user name under which the QTI runs requires the minimum quotas shown in *Table A.4, "Minimum Quotas for the QTI User Name Process"*.

Table A.4. Minimum Quotas for the QTI User Name Process

Parameter	Minimum Value (Alpha)	Minimum Value (IA-64)
ASTLM	250	250
BIOLM	150	150
BYTLM	64000	64000
DIOLM	150	150
ENQLM	2000	2000
FILLM	100	100
PGFLQUOTA	50000	50000
TQELM	–	–
WSDEFAULT	–	–
WSEXTENT	–	–
WSQUOTA	–	–

WSEXTENT is usually higher than WSQUOTA to make the most of the OpenVMS dynamic working set size adjustment algorithms. To set reasonable figures, monitor the live system to determine the page fault rate of the QTI process.

A.2.4.1. How ACMSPARAM.COM Calculates Values for the QTI

This section shows the formulas for how ACMSPARAM.COM calculates parameter values for the QTI. If the calculated values are below the minimum values shown in *Table A.4, "Minimum Quotas for the QTI User Name Process"*, then ACMSPARAM.COM assigns the minimum values.

Use these formulas for information or fine-tuning purposes only. VSI recommends that you use the ACMSPARAM.COM procedure, which is discussed in detail in *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"*, to perform these calculations to determine the QTI quota values.

Refer to *Table 10.3, "Variables Required for ACMSPARAM.COM"* for descriptions of the variables shown in these calculations.

Working Set on Alpha

```
WSDEFAULT  = 2000 + (20*QTI_TASK_THDS)    ! Working set
WSEXTENT = 16384 + (50*QTI_TASK_THDS)     ! sizes for
WSQUOTA = 4000 + (50*QTI_TASK_THDS)       ! QTI user name
```

Working Set on IA-64

```
WSDEFAULT  = 2000 + (20*QTI_TASK_THDS)    ! Working set
WSEXTENT = 16384 + (50*QTI_TASK_THDS)     ! sizes for
WSQUOTA = 4000 + (50*QTI_TASK_THDS)       ! QTI user name
```

ASTLM

```
ASTLM = 24 +                              ! base
        (QTI_TASK_THDS * 2) +             ! one AST for each thread
        (2 * QTI_SUBMITTERS) +            ! session receives and messages
        (3 * QTI_QUEUES)                  ! RMS overhead
```

BIOLM

```
BIOLM = 18 +                              ! base
        QTI_TASK_THDS                     ! MSS DECnet i/o
```

BYTLM

```
BYTLM = 8192 +                            ! base
            (2 * REMOTE_APPL_CNT *        ! 2 MSS buffers for each link
             MSS_MAXBUF) +               (2048 * QTI_QUEUES) +       ! RMS
 overhead
            (1024 * QTI_TASK_THDS)
```

DIOLM

```
DIOLM = 18 +                              ! base
        QTI_TASK_THDS                     ! disk i/o
```

ENQLM

```
ENQLM = 69 +                              ! base
        (15 * QTI_TASK_THDS) +            ! RMS
        (QTI_QUEUES * 4)                  ! ASTs and locking
```

FILLM

```
FILLM = 20 +                              ! base
        REMOTE_APPL_CNT +                 ! DECnet links
        QTI_QUEUES                        ! 1 for each queue file
```

PGFLQUOTA

```
PGFLQUOTA =
     8192 +                               ! base
     MSS_PROCESS_POOL +                   ! MSS pool
     (5831 +                              ! buffer for each operator request
```

```
      (QTI_TASK_THDS *
      (16272 + QTI_MAX_WSP_SIZE)) +     ! buffer for each task thread
      (QTI_QUEUES * 792) +              ! buffer for each task queue
      (QTI_SUBMITTERS *
      (MSS_MAXBUF + 2064)) +            ! buffer for each submitter
      512) / 512 Include 10% for expansion  PGFLQUOTA = PGFLQUOTA +
 (PGFLQUOTA/10)
```

TQELM

```
TQELM = 20 +                    ! base
        (QTI_TASK_THDS  * 2)    ! one timer for each thread
```

A.2.5. User Name Setup for the EXC

The OpenVMS user name under which the EXC runs must have OpenVMS SETPRV and SYSPRV privileges. Define this user name with the ADU application definition clause APPLICATION USERNAME.

The OpenVMS user name under which the EXC runs requires the minimum quotas shown in *Table A.5, "Minimum Quotas for the EXC User Name Process"*.

Table A.5. Minimum Quotas for the EXC User Name Process

Parameter	Minimum Value (Alpha)	Minimum Value (IA-64)
ASTLM	40	250
BIOLM	40	150
BYTLM	32768	64000
DIOLM	40	150
ENQLM	200	2000
FILLM	100	100
PGFLQUOTA	32768	50000
TQELM	–	–
WSDEFAULT	–	–
WSEXTENT	–	–
WSQUOTA	–	–

WSEXTENT is usually higher than WSQUOTA to make the most of the OpenVMS dynamic working set size adjustment algorithms. To set reasonable figures, monitor the live system to determine the page fault rate of the EXC process.

The EXC user name requires access to application databases (.ADB files), task group databases (.TDB files), message files, and request libraries.

A.2.5.1. How ACMEXCPAR.COM Calculates Values for the EXC

This section shows the formulas for how ACMEXCPAR.COM calculates parameter values for the CP. If the calculated values are below the minimum values shown in *Table A.5, "Minimum Quotas for the EXC User Name Process"*, then ACMEXCPAR.COM assigns the minimum values.

Use these formulas for information or fine-tuning purposes only. VSI recommends that you use the ACMEXCPAR.COM procedure, which is described in *Chapter 10, "Setting ACMS Quotas, Parameters, and Privileges"*, to perform these calculations to determine the EXC quota values.

Refer to *Table 10.3, "Variables Required for ACMSPARAM.COM"* for descriptions of the variables shown in these calculations.

Working Set on Alpha

```
WSDEFAULT  2000 + (20 * EXC_TK_INSTANCE_CNT)  ! Working set quotas
WSEXTENT  16384 + (50 * EXC_TK_INSTANCE_CNT)  ! for the
WSQUOTA    4000 + (20 * EXC_TK_INSTANCE_CNT)  ! EXC user name
```

Working Set on IA-64

```
WSDEFAULT  2000 + (20 * EXC_TK_INSTANCE_CNT)  ! Working set quotas
WSEXTENT  16384 + (50 * EXC_TK_INSTANCE_CNT)  ! for the
WSQUOTA    4000 + (20 * EXC_TK_INSTANCE_CNT)  ! EXC user name
```

ASTLM

```
ASTLM = 24 +                              ! base
        (5 * EXC_TK_INSTANCE_CNT) +       ! terminal i/o + DECnet sends
        EXC_SP_CNT +                      ! max SP's for this appl
        EXC_SERVER_CNT +                  ! num of servers defined for appl
        (2 * AGENT_CNT)                   ! MSS receives from agents
```

BIOLM

```
BIOLM = 10 +                              ! base
        EXC_TK_INSTANCE_CNT +             ! TDMS i/o and MSS network sends
        (2 * REMOTE_AGENT_CNT)            ! DECnet receives
```

BYTLM

```
BYTLM = 8192 +                            ! base
        (1000 * LOCAL_TDMS_TASK_CNT) +    ! TDMS i/o
        (((2 * REMOTE_AGENT_CNT) +        ! MSS DECnet link receives
        REMOTE_TK_INSTANCE_CNT)
         * MSS_MAXBUF) +                  ! MSS DECnet link sends
        (MAXPROCESSCNT * 84)              ! SP termination notification
```

DIOLM

```
DIOLM = 20 +                              ! base
        EXC_TK_INSTANCE_CNT               ! rlb i/o
```

ENQLM

```
ENQLM = 20 +                              ! base
        ((EXC_RLB_CNT + EXC_MSG_CNT +
        FORM_CNT +
        EXC_TDB_CNT) * 4)                 ! rlb, tdb and msg file opens & I/
O
```

FILLM

```
FILLM = 20 +                              ! base
        EXC_RLB_CNT +                     ! rlbs
```

```
        FORM_CNT +                          ! DECforms forms
        EXC_MSG_CNT +                       ! message files
        EXC_TDB_CNT +                       ! tdbs
        (2 * REMOTE_AGENT_CNT)              ! DECnet channels
```

PGFLQUOTA

```
PGFLQUOTA = 7500 +                            ! base
            (20 * EXC_TK_INSTANCE_CNT) +      ! EXC's task context
            ((TWS_POOLSIZE + TWSC_POOLSIZE)
            * EXC_TDB_CNT) +                  ! WKSP pools
            (WS_POOLSIZE + WSC_POOLSIZE) +    ! group/user wksp pools
            MSS_PROCESS_POOL +                ! MSS process pool
            EXC_RLB_BLKS +                    ! rlb caching
            (LOCAL_TDMS_TASK_CNT * 100) +     ! Local TDMS tasks
            EXC_ADB_BLKS +                    ! Size of ADB
            EXC_TDB_BLKS                      ! Size of TDBs
```

TQELM

```
TQELM = 1 +                                 ! base
        (2 * EXC_SERVER_CNT) +              ! server management
        EXC_TK_INSTANCE_CNT +               ! ast for each task instance for
 i/o
        EXC_SP_CNT                          ! server process communications
```

A.2.6. Calculating Quotas for ACMS Server Processes

This section shows how to derive the minimum quotas required for the server processes. By increasing the base default value assigned to the AUTHORIZE quota by the amounts shown in *Figure A.1, "Minimum Quotas for Server Processes"*, you can determine the minimum server process quota.

In *Figure A.1, "Minimum Quotas for Server Processes"*, the number represented by BASE is the default value assigned to the AUTHORIZE quota. This number represents the base quota requirement for the processing being done in the server (not for the server process itself). The BASE amount varies for each ACMS system. Generally, the default BASE quota assigned for the process is sufficient. The number after BASE + indicates the minimum amount that should be added to bring the quota value up to the minimum required by the ACMS server process.

The only privilege ACMS requires server processes to have is TMPMBX. The quotas required by an ACMS server process are dependent on the type of processing the server performs.

Figure A.1. Minimum Quotas for Server Processes

```
ASTLM     BASE + 2              ! for procedure servers
          BASE + 4              ! for DCL servers

BIOLM     BASE + 2              !for procedure servers
          BASE + 4              !for DCL servers

BYTLM     BASE + 2000

DIOLM     BASE + 2

FILLM     BASE + 10

PGFLQUOTA BASE + MSS_PROCESS_POOL + 200
```

Check the DBMS and Rdb installation guides if your server code accesses these products. Additional resources required for using these products, such as ENQLM, are explained in the appropriate installation guides.

A.3. Calculating Quotas for Using the ADU Utility

Users who plan to use the ADU must set quotas equal to or greater than the minimum values shown in *Figure A.2, "Minimum Quotas for Using ADU"*. Be sure to refer to documentation for related products, such as the CDD dictionary, for further quota limits that may be required.

Figure A.2. Minimum Quotas for Using ADU

```
ENQLM        100
FILLM         25 + (the number of files specified with the /OBJECT
                    qualifier to the BUILD GROUP command)
                 + (the number of files specified with the
                    /USERLIBRARY qualifier to the BUILD GROUP
                    command)
                 + 2            ! if STARTLET.OLB and IMAGELIB are
                                ! searched when resolving
                                ! global symbols  PRCLM          1
```

Determining the values for the working set (WSDEFAULT, WSEXTENT, WSQUOTA) and the PGFLQUOTA involves experimentation and modification over time. Some factors to consider when setting these values include:

- Amount of available memory
- CPU processing power
- Complexity of ACMS task groups

ADU typically requires higher quotas than those set by default for the working set and the PGFLQUOTA.

A.4. Calculating Quotas for Using the ACMS Task Debugger

Users who plan to run tasks under the task debugger must set quotas equal to or greater than those listed in *Figure A.3, "Minimum Quotas for Using the Task Debugger"*. The only privilege ACMS requires server processes to have is TMPMBX.

Figure A.3. Minimum Quotas for Using the Task Debugger

```
ASTLM        10
BYTLM     50000
ENQLM       100
FILLM        96
PRCLM         1 + maximum number of servers that can
                  be started by the task debugger
TQELM        10
```

Users might need a BYTLM value greater than 50,000 if they start the task debugger with the **/WORKSPACE_DEBUG** qualifier and start more than one server during a task debugging session. Also, the subprocess quota should be greater than 1 to allow the task debugger to start subprocesses.

See *VSI ACMS for OpenVMS Writing Server Procedures* [https://docs.vmssoftware.com/vsi-acms-writing-server-proc/] for complete information on the ACMSDEBUG Utility and the associated **ACMS/DEBUG** commands.

A.5. Calculating Values for Certain ACMSGEN Parameters

ACMS provides values for ACMSGEN parameters as defaults or through ACMSPARAM.COM. These values normally suffice; however, for several ACMSGEN parameters you may want to calculate values independently to more accurately reflect your ACMS system. In such cases, include the new value as a variable in ACMVARINI.DAT that corresponds to the ACMSGEN parameter. Then run ACMSPARAM.COM. The command procedure uses the new variable value to generate a new ACMSGEN parameter.

The following sections describe the calculations for the ACMSGEN parameters whose values you may want to change from the values supplied by default or by ACMSPARAM.COM.

A.5.1. Calculating the Value of MAX_LOGINS

MAX_LOGINS limits the number of users who can sign in to ACMS.

To increase the effective value for the ACMSGEN parameter MAX_LOGINS, you may also have to change the value of the parameters MAX_TTS_CP or CP_SLOTS. A user can sign in only if ACMS can assign the user's terminal to a Command Process (CP). The total number of terminals all your Command Processes can handle is the product of:

- The number of terminals one Command Process can service, the MAX_TTS_CP value
- The maximum number of Command Processes that can run when ACMS is active, the CP_SLOTS value

The number of users who can sign in can never be greater than the product of the MAX_TTS_CP value and the CP_SLOTS value. Once the value you set for the MAX_LOGINS parameter reaches the product of the MAX_TTS_CP and CP_SLOTS parameters, merely increasing the value of the MAX_LOGINS parameter has no effect. To increase the number of users who can sign in, you must also increase the value of the MAX_TTS_CP or the CP_SLOTS parameter.

The ACMSGEN parameter MAX_LOGINS is only checked for task submitters signing in through the TSC. Any other sign-ins (from user-written agents, detached tasks, and the QTI) are not counted against the MAX_LOGINS value.

If you have a large number of users who sign in through user-written agents, detached tasks, and the QTI, you may want to fine-tune the working set size of the ACC. ACMSPARAM.COM uses the following minimum values for ACC's working set quotas:

Parameter	Minimum Value (Alpha)	Minimum Value (IA-64)
WSDEFAULT	2000	2000
WSEXTENT	16384	16384

Parameter	Minimum Value (Alpha)	Minimum Value (IA-64)
WSQUOTA	4000	4000

The WSDEFAULT and WSEXTENT quotas may be low for the ACC user name if there are many sign-ins/sign-outs. WSEXTENT is usually higher than WSQUOTA to make the most of the OpenVMS dynamic working set size adjustment algorithms. To set reasonable figures, monitor the live system to determine the page fault rate of the ACC process and set the working set quotas appropriately.

A.5.2. Calculating the Value of MSS_MAXOBJ

The ACMSGEN message switch parameter MSS_MAXOBJ is the number of message switch objects that can be created on a system at one time. The ACMSPARAM.COM calculation of MSS_MAXOBJ follows:

```
MSS_MAXOBJ = 15 + (CP_PROC_CNT * (4 + TERMINALS_PER_CP))
                + (2 * OPR_ENTER_RETURN_CNT)
                + (6 * APPL_CNT)
                + (3 * TOTAL_SP_CNT)
                + QTI_SUBMITTERS
                + ((AGENT_CNT * 3) + AGENT_SUB_CNT)
                + (2 * OPERATOR_CNT)
                + (5 * DEBUGGER_CNT)
MSS_MAXOBJ =  MSS_MAXOBJ + (.10 * MSS_MAXOBJ)
```

A.5.3. Calculating the Value of MSS_MAXBUF

The ACMSGEN message switch parameter MSS_MAXBUF is the size of a buffer that the ACMS message switch uses to handle message traffic. If this buffer is not large enough to hold a message, the message is sent in blocks.

ACMSPARAM.COM calculates MSS_MAXBUF based on the largest message passed in an exchange step in your application so that you never incur the cost of message blocking. The ACMSPARAM.COM calculation of MSS_MAXBUF follows:

```
MSS_MAXBUF =   280
             + LARGEST_MESSAGE
             + (17 * LARGEST_MESSAGE_NUM_WKSP)
MSS_MAXBUF = MSS_MAXBUF + MSS_MAXBUF/10
```

This formula is based on a DECforms request and is also the one used in the ACMSPARAM.COM file. If you wish to determine more accurately the value of the MSS_MAXBUF parameter, use the following formula:

```
MAX_MAXBUF = 216
             + RECORD_REQUEST_NAMES
             + ( NUM_WSPS * 17 )
             + SUM_WSPS_LEN
MSS_MAXBUF = MSS_MAXBUF + MSS_MAXBUF/10
```

In this formula 216 is the message overhead for DECforms request (use 144 as the message overhead for TDMS request). RECORD_REQUEST_NAMES is the length in bytes of the record ID or request name round to next higher longword. NUM_WSPS is the number of workspaces. Round the product to next higher longword. SUM_WSPS_LEN is the sum of lengths of workspaces, each rounded to next higher longword.

For example, you have an exchange step like this:

```
EXCHANGE
    SEND EMPLOYEE_RECORD
    SENDING EMPLOYEE_MAIN_DATA, EMPLOYEE_SUB_DATA;
```

In this example, EMPLOYEE_MAIN_DATA is 400 bytes long and EMPLOYEE_SUB_DATA is 35 bytes long. The values to use are:

```
  216     !Message overhead for DECforms request =216
+ 16      ! Length of "employee_record" = 15 = 16 rounded
+ 36      ! 2 workspaces * 17 = 34 = 36 rounded
+400      ! Length of employee_main_data workspace = 400
+ 36      ! Length of employee_sub_data workspace = 35 = 36 rounded
-----
  704     ! message length, in bytes
+ 70      ! 10% expansion
_____
  774     ! total message length, in bytes
```

The minimum size of MSS_MAXBUF is 512.

There may be circumstances for which you are willing to incur message blocking. In such cases, you may not want to have ACMSPARAM.COM calculate the MSS_MAXBUF parameter. Instead, calculate MSS_MAXBUF as described in the following example, add the values as a variable in ACMVARINI.DAT, and then run ACMSPARAM.COM.

For example, the exchange step with the maximum total message size may be much larger than any other exchange step and may be in a task that is selected infrequently. In this case you still want to choose a MSS_MAXBUF size that is not wasteful. Choose a value that satisfies the following constraints:

- The value should be large enough to accommodate any frequently accessed exchange step.
- Allow for enough space so that the message can be divided into approximately equal blocks, so that space is not wasted.

When a message requires multiple blocks to send, an additional 28 bytes of message overhead is incurred to send blocks other than the first block. If the data cannot be sent in one message, ACMS uses the following formula to calculate how many data segments are needed:

$$\text{TOTAL_DATA_SEGMENTS} = 1 + \frac{(\text{Message_length} - \text{MSS_MAXBUF})}{(\text{MSS_MAXBUF} - 28)}$$

This formula may not result in message blocks of approximately equal size. To divide a message into approximately equal blocks, you must decide on how many data segments you want to use, and then calculate MSS_MAXBUF so that ACMS correctly calculates the desired value of TOTAL_DATA_SEGMENTS. To do this, apply the message length and segment numbers to the following formula to determine the value of MSS_MAXBUF:

$$\text{MSS_MAXBUF} = \frac{(\text{Message_length} - 28)}{\text{TOTAL_DATA_SEGMENTS}} + 28$$

For example, if the total number of bytes for the entire message is 20000 and you want to use 4 data segments to send it, the calculation is:

$$\frac{20000 - 28}{}$$

```
     MSS_MAXBUF = ---------- + 28
                        4
     MSS_MAXBUF = 5021
```

A.5.4. Calculating the Value of MSS_POOLSIZE

MSS_POOLSIZE is the maximum amount of memory that can be used to send messages. ACMSPARAM.COM calculates this parameter as follows:

```
MSS_POOLSIZE = ( ( (56 * MSS_MAXOBJ)
                 + (144 * MAXPROCESSCNT)
                 + (MSS_MAXBUF * TOTAL_TK_INSTANCE_CNT)
                 + (TERMINAL_CNT * 128)
                 + (TOTAL_SP_CNT * 64)
                 + (OPERATOR_CNT * 5120)
                 + 567)
                 / 512) + 32
MSS_POOLSIZE = MSS_POOLSIZE + (MSS_POOLSIZE/10)
```

A.5.5. Calculating the Value of MSS_PROCESS_POOL

MSS_PROCESS_POOL defines the size of the ACMS internal message switch process local pool. ACMSPARAM.COM calculates this parameter as follows:

```
For an application node:
MSS_PROCESS_POOL = ((MSS_MAXBUF * 2 * REMOTE_SUB_CNT) / 512) + 32
For a submitter node:
MSS_PROCESS_POOL = (((MSS_MAXBUF * 2 * REMOTE_APPL_CNT) / 512) * 4) + 32
```

The value of MSS_PROCESS_POOL must be at least 256.

If the node is both an application node and a submitter node, the command procedure uses the higher of the two values calculated in the previous example.

A.5.6. Calculating the Value of PERM_CPS

PERM_CPS sets the number of permanently active Command Processes. The default value is 1.

To increase the effective value of PERM_CPS, you may also need to change the value of the parameter MAX_LOGINS or MAX_TTS_CP.

The effective number of permanently active Command Processes is the lesser of:

- The value for the PERM_CPS parameter
- The result of the MAX_LOGINS value divided by the MAX_TTS_CP value

At startup, when ACMS computes the maximum number of Command Processes the system might need, ACMS divides the value of MAX_LOGINS by the value of MAX_TTS_CP. For example, if you defined MAX_LOGINS as 60 and MAX_TTS_CP as 20, ACMS would never set up more than three Command Processes. In this case, if the PERM_CPS value is greater than 3, ACMS ignores the PERM_CPS value. ACMS does not start more command processes than all of your terminal users can use.

Once the value you set for the PERM_CPS parameter reaches the result of MAX_LOGINS divided by MAX_TTS_CP, merely increasing the value of the PERM_CPS parameter has no effect. To increase

the effective value of PERM_CPS further, you must also increase the value of the MAX_LOGINS parameter or decrease the value of the MAX_TTS_CP parameter. This situation is unusual, however. There is no reason to increase the number of permanent Command Processes to more than you need to service all terminal users. In most cases, set the number of permanent Command Processes to a value adequate for handling your common number of users.

A.5.7. Calculating ACMS Workspace Pools

When you start an application, ACMS allocates a number of shared and private memory pools to hold the data and control structures associated with the workspaces used by the tasks in your application. Calculate the amount of space your application requires in these pools so that ACMS can allocate sufficient memory to hold the data and control information.

A.5.7.1. Types of Workspace Pools

The four types of ACMS workspace pools are listed in *Table A.6, "Types of ACMS Workspace Pools"* with their default values.

Table A.6. Types of ACMS Workspace Pools

Type	Default Value (Alpha)	Default Value (IA-64)
Task instance workspace control pool	50 pagelets	50 pagelets
Task instance workspace pool	1600 pagelets	1600 pagelets
Workspace pool	256 pagelets	256 pagelets
Control pool	128 pagelets	128 pagelets

ACMS allocates a task instance workspace pool and a task instance workspace control pool for each task group in your application. These pools are used to hold data and control information for active task instances in their respective groups and are shared by the EXC process and the server processes.

ACMS also allocates a workspace pool and a workspace control pool to hold workspace data and control information associated with the master copies of group and user workspaces. These two pools are used by all the task groups in the application and are allocated in the private memory of the EXC process.

A.5.7.2. Workspace Pool Allocation Failures

There are four conditions under which ACMS fails to allocate blocks of memory from workspace pools:

- There is insufficient free space within the pool to satisfy the request
- There is insufficient free contiguous space within the pool to satisfy the request. In this case, there may be sufficient total free space; however, there is no single free block that is large enough to accommodate the request.
- A request is made to allocate a single block whose size exceeds 65,536 bytes. Since ACMS only allocates blocks of memory in powers of 2 up to and including 65,536 bytes long, redesign your task to use fewer or smaller workspaces.
- A request is made to allocate a block that would cause the total amount of pool allocated to exceed the total size of the pool.

The EXC cancels a task during the task-initialization phase if it is unable to allocate sufficient space within one of the workspace pools. The error reported is "Error starting task: Unable to allocate workspace resources, please try later" on the user's terminal. Information about the task cancellation is written to the Audit Trail Log. The entry includes the following information:

```
"Error allocating {number} bytes in TWSC pool {workspace-pool-name} for
 workspaces"
```

See *Chapter 12, "Auditing Applications with the Audit Trail Logger"* for information about the audit trail record generated by this error.

Use the **ACMS/SHOW APPLICATION/POOL** command to determine the amount of free space within the workspace pools that are being used by your applications. This display also shows the size of the largest block that may be allocated from the pool. If you find that there is sufficient free space to satisfy a request, but that the free space is not contiguous, then this is an indication that the free space inside the workspace pools has become fragmented. Increasing the amount of memory allocated to the pool solves this problem and allows ACMS to better manage the free space within the pool.

A.5.7.3. ACMS Workspace Pool Requirements

The following sections describe how to calculate the amount of space required in each of the four types of workspace pools.

ACMS reserves the first pagelet in each pool for pool control structures. Before allocating a block of memory from a pool, ACMS rounds the size of the requested block up to the next highest power of two. ACMS uses this allocation algorithm to reduce the possibility of pool fragmentation and to provide a fast pool-space allocation time. When calculating the amount of space required by a task, take this information into account.

For example, you calculate that a task requires a block of 956 bytes from the task instance pool for six task workspaces and three system workspaces. You then calculate that these nine workspaces require a block of 196 bytes (52 + (16 * 9)) from the task instance control pool. Both these figures must then be rounded up to the next highest power of two. In this example, the task requires 1024 bytes from the task instance workspace pool and 256 bytes from the task instance workspace control pool.

A.5.7.3.1. Task Instance Workspace Pool Requirements

Each task instance requires a block of this pool equal to the sum of the sizes of the system workspaces (519 bytes) and the sum of the sizes of the task, user, and group workspaces used by the task.

A.5.7.3.2. Task Instance Control Pool Requirements

Each task requires a block of this pool large enough to hold

- 52 bytes of task workspace header information. This structure contains information needed by ACMS to identify the owner of the workspaces and to map the task instance workspace block in the task instance workspace pool.
- 16 bytes of control information for each task, user, group, and system workspace. ACMS uses these structures to locate each individual workspace owned by a task instance and to point to the master copies of any group and user workspaces referenced by a task instance.

ACMS allocates blocks from these two pools at the beginning of a task instance and frees the blocks at the end of the task instance.

Group and user workspaces require additional overhead information. Memory for this information is allocated from the workspace pool and the control pool. The amount of additional pool required depends on the type of workspace involved.

A.5.7.3.3. Group Workspace Pool Requirements

Because group workspaces can be shared among instances of different tasks within a task group, they require more control information to be kept.

The first time a group workspace is accessed within a task group, a 24-byte workspace descriptor is allocated from the control pool. Space must also be allocated from the workspace pool to contain the master copy of the workspace.

When a task that uses a particular group workspace is initiated, the master copy is moved into a local copy for the exclusive use of the task instance. When the task instance ends, the master copy of each group workspace that allows updating is updated from these local copies.

Therefore, the overhead for group workspaces is 32 bytes (24 bytes rounded up to the next power of two) from the control pool, plus an amount of workspace pool equal to the size of the group workspace. This value is rounded up to the next power of two.

Once allocated, the overhead pool for group workspaces is released only when the application is stopped. ACMS reserves an 8-byte block to hold a header for the queue of all the group workspaces in an application.

A.5.7.3.4. User Workspace Pool Requirements

User workspaces are maintained on a per-submitter basis, so master copies of user workspaces must be maintained for each submitter.

The first time a submitter accesses a user workspace, a 48-byte workspace submitter block must be allocated from the control pool. This block contains the header for the queue of master copies of user workspaces for this submitter. It also contains some submitter identification.

The first time a user workspace is used by a submitter, a 24-byte workspace descriptor is allocated from the control pool. Enough workspace pool must be allocated to contain the master copy of this user workspace. The workspace descriptor points to the master copy and is queued to the submitter block.

When the user workspace is referenced, the master copy is used to initialize a local copy that is provided to the task instance. When the task ends, the master copy of each user workspace is updated, if necessary, from the local copy.

The overhead for user workspaces is:

- One 64-byte block (48 bytes rounded) of control pool for each submitter
- One 32-byte block (24 bytes rounded up to the next power of two) of control pool for each user workspace used for each submitter
- Enough workspace pool to contain the master copy of each user workspace used, rounded up to the next power of two

This "overhead" pool is released when the submitter signs out.

ACMS reserves an 8-byte block to hold a header for the queue of all the group workspaces in an application.

A.5.7.4. Calculating Workspace Pool Sizes

This section describes how to calculate values for the following workspace pool parameters:

- TWS_POOLSIZE
- TWSC_POOLSIZE
- WS_POOLSIZE
- WSC_POOLSIZE

This section also provides information about defining logical names to size the workspace pools to set values for these parameters on a per-application basis.

A.5.7.4.1. Calculating the Value of TWS_POOLSIZE and TWSC_POOLSIZE

ACMSPARAM.COM calculates the ACMSGEN parameters TWS_POOLSIZE and TWSC_POOLSIZE as follows:

```
Calculate for each TDB and use the highest value:
TWS_POOLSIZE = (Pagesize + (wksp_size_sum * TOTAL_TK_INSTANCE_CNT)) / 512
 where:
   wksp_size_sum = ((sum of group workspace sizes +
                     (sum of user workspace sizes +
                     (sum of task workspace sizes)
                       rounded to next power of 2)
   Pagesize is the CPU-specific page size (in bytes) of the VAX or
   Alpha system.

Calculate for each TDB and use the highest value:
TWSC_POOLSIZE = (512 + (wksp_factor * TOTAL_TK_INSTANCE_CNT)) / 512
where wksp_factor = (52 + (16 * wksp_cnt_sum)) rounded up to the
                     next highest power of 2.
      wksp_cnt_sum = (number of group workspaces in TDB)+
                     (number of user workspaces in TDB) +
                     (number of task workspaces in TDB)
```

The ACMSPARAM.COM calculations are estimations. If you wish to determine more accurately the value of the TWS_POOLSIZE and TWSC_POOLSIZE parameters, calculate the amount of pool required by each task group in each application on your system, and select the highest value from each calculation.

To calculate the size of each pool required by each task group, you need to consider how many users will be simultaneously executing each task in the task group. After calculating the workspace pool requirements of each task, multiply these values by the number of users who will be running those tasks simultaneously.

Use the following formula to determine the value for the TWS_POOLSIZE parameter for each task group in each application:

```
(Pagesize                          ! pool control and management overhead
+ ( t-1 * s-1 )
+ ( t-2 * s-2 )
+ [...]
+ ( t-n * s-n ) )/512
```

```
where:
    Pagesize is the CPU-specific page size (in bytes) of the VAX or
    Alpha system.

    t-n = (the greater of the following:
          a) sum of sizes of workspaces used by task 'n' rounded up to
             the next power of 2
          b) the CPU-specific page size()
    s-n = <number of submitters simultaneously executing task 'n'>
```

Use the following formula to determine the value for the TWSC_POOLSIZE parameter for each task group in each application:

```
(512                          ! pool control and management overhead
+ ( c-1 * s-1 )
+ ( c-2 * s-2 )
+  [...]
+ ( c-n * s-n ) )/512

where:
    c-n = ( 52 + ( 16 * <number of workspaces used by task 'n'> ) )
           rounded up to the next power of 2
    s-n = <number of submitters concurrently executing task 'n'>
```

A.5.7.4.2. Calculating the Value of WS_POOLSIZE and WSC_POOLSIZE

ACMSPARAM.COM calculates the ACMSGEN parameters WS_POOLSIZE and WSC_POOLSIZE as follows:

```
Calculate for each application and use the highest value:
WS_POOLSIZE = (512 +
               grp_wksp_size_sum +
               (user_wksp_size_sum + TOTAL_TK_INSTANCE_CNT)) / 512
where grp_wksp_size_sum = sum of: each group workspace size
                          rounded up to the next highest power of 2
      user_wksp_size_sum = sum of: each user workspace size
                           rounded up to the next highest power of 2

Calculate for each application and use the highest value:
WSC_POOLSIZE = (512 +
                (16 * (number of TDBs in application)) +
                (32 * (number of group workspaces in all TDBs in
 application))+
                (64 * TOTAL_TK_INSTANCE_CNT) +
                (32 * TOTAL_TK_INSTANCE_CNT)) / 512
```

The ACMSPARAM.COM calculations are estimations. If you wish to determine more accurately the value of the WS_POOLSIZE and WSC_POOLSIZE parameters, calculate the amount of pool required by each application on your system and select the highest value from each calculation.

To calculate the size of each pool required by each application, consider how many group and user workspaces are used concurrently in each application.

Use the following formula to determine the value for the WS_POOLSIZE parameter for each application:

```
(512                         ! pool control and management overhead
+ ( g-1 + g-2 + [...] + g-n )
```

```
+ ( u-1 * s-1 )
+ ( u-2 * s-2 )
+ [...]
+ ( u-n * s-n ) )/512

where:
    g-n = <size of group workspace 'n'> rounded up to the next power of 2
    u-n = <size of user workspace 'n'> rounded up to the next power of 2
    s-n = <number of submitters accessing user workspace 'n'>
```

Use the following formula to determine the value for the WSC_POOLSIZE parameter for each task group in each application:

```
(512                            ! pool control and management overhead
+ ( 16 * < number of groups     ! group workspace and submitter list
 control
        in the application> )   ! structures

+ ( 32 * < sum of number of     ! group workspace control blocks
    group workspaces used in
    each task group in the
    application> )

+ ( 64 * < number of submitters ! submitter control blocks
    accessing user workspaces
    in the application> )

+ ( 32 * s-1 )                  ! user workspace control blocks
+ ( 32 * s-2 )                  ! user workspace control blocks
+ [...]
+ ( 32 * s-n ) )/512            ! user workspace control blocks
where:
    s-n = number of submitters accessing user workspace 'n'
```

A.5.7.4.3. Defining Logical Names for Workspace Pool Sizes

You can define the following logical names to size the workspace pools on a per-application basis:

- ACMS$EXC_WS_POOLSIZE
- ACMS$EXC_WSC_POOLSIZE
- ACMS$EXC_TWS_POOLSIZE
- ACMS$EXC_TWSC_POOLSIZE

You can define the logical names at any DCL level where the executable can translate them. To make them application-specific, reference logical names in the application definition or in a name table associated with an application. The following example shows referencing two of the logical names in the application definition:

```
APPLICATION LOGICAL NAMES ARE
    ACMS$EXC_TWS_POOLSIZE = "1750",
    ACMS$EXC_TWSC_POOLSIZE = "75";
```

The EXC allows one additional translation of the logical name so that an application definition does not have to be rebuilt to change a value. For example:

- In the Application Definition Utility (ADU):

```
APPLICATION LOGICAL NAMES ARE
    ACMS$EXC_TWS_POOLSIZE = "ACMS$EXC_<appl_name>_TWS_POOLSIZE";
```

- At DCL level:

```
$ DEFINE/SYSTEM ACMS$EXC_<appl_name>_TWS_POOLSIZE  "1750"
```

In the preceding examples of the additional logical name definitions, <appl_name> is the name of the application.

Remember the following about using these logical names:

- The logical name (or the translation of it) must contain a valid decimal number (in pagelets for Alpha).
- ACMS uses the ACMSGEN parameters if the logical cannot be translated or the logical contains an invalid value or character.
- As with any value specified by ACMSGEN, if the value contained in one or more of the logicals is too high, the application will not start.
- The ACMSPARAM and ACMEXCPAR procedures will not have any knowledge of the changes made to the workspace pools by using these logicals. Any calculations done by these procedures will reflect the values in ACMSGEN.

Appendix B. Error Messages

This appendix contains file specifications for the ACMS error message files and information about how ACMS reports error messages generated by other products.

B.1. ACMS Error Messages

For explanations and user actions on the messages the ACMS commands and application management utilities return, use the help available for each utility, or type or print the following files at DCL command level:

```
SYS$SYSROOT:[SYSHLP]ACMSAAU.MEM
SYS$SYSROOT:[SYSHLP]ACMSATR.MEM
SYS$SYSROOT:[SYSHLP]ACMSDDU.MEM
SYS$SYSROOT:[SYSHLP]ACMSGEN.MEM
SYS$SYSROOT:[SYSHLP]ACMSQUEMGR.MEM
SYS$SYSROOT:[SYSHLP]ACMSRUN.MEM
SYS$SYSROOT:[SYSHLP]ACMSSWL.MEM
SYS$SYSROOT:[SYSHLP]ACMSUDU.MEM
```

Online help is not available for terminal user messages. For an explanation of terminal user messages, display or print the following file:

```
SYS$SYSROOT:[SYSHLP]ACMSTU.MEM
```

Online help is not available for Audit Trail Logger errors. For an explanation of messages written to the Audit Trail Logger, display or print the following file:

```
SYS$SYSROOT:[SYSHLP]ACMSATL.MEM
```

B.2. Error Messages from Other Products

The ACMS Audit Trail Report (ATR) Utility cannot translate message codes from any facility other than ACMS and TDMS. When an error generated by another product occurs, ACMS reports the error message number of the message, not the message itself, for example:

```
message number 000288664
```

Enable the ATR Utility to translate message codes from other products by using the **SET MESSAGE** command and specifying the name of the product's error message file, for example:

```
$ SET MESSAGE SYS$MESSAGE:DBMMSG.EXE
```

See documentation on the product you are interested in for the name of its error message file.

Appendix C. Requirements for Successful ACMS Sign-Ins

As system manager, you must understand the problems users can have when they try to sign in to ACMS. You have control over the tools that can prevent or allow successful sign-ins. This appendix lists a set of requirements to help ensure that users can access ACMS.

C.1. ACMS Sign-In Requirements

The ACMS software requires that certain files be present and certain entries be available in various databases before users can sign in to ACMS on ACMS-controlled or OpenVMS-controlled terminals. The requirements listed here can help you identify problems users encounter.

First, check the Software Event Log (SWL) and the Audit Trail Report (ATR) for additional details on the failure. If the SWL and audit information is not detailed enough to resolve the problem, then continue with the following checklist.

When these errors occur for only *some* of the users typing an **ACMS/ENTER**, check the following items:

- The user must have a valid entry in the OpenVMS SYSUAF.DAT file. In cases in which the OpenVMS SYSUAF.DAT file has been modified (such as where cluster creation has required several SYSUAF.DAT files to be merged together), ACMS must be stopped and restarted to map the newly modified SYSUAF.DAT into memory.

- The user doing the **ACMS/ENTER** is listed specifically in the User Definition Utility (ACMSUDF.DAT) file, or $ALL is used.

- The terminal from where the **ACMS/ENTER** was keyed is listed specifically in the Device Definition Utility (ACMSDDF.DAT) file, or $ALL is used.

- The terminal type is supported by both ACMS and any forms product in use by ACMS (such as DECforms or TDMS).

- The menu database file (.MDB) specified in the ACMSUDF.DAT database for the terminal user must be valid and exist in the correct disk directory. Beware of process logical names, because separate processes are involved. SYSTEM logicals are recommended.

- The menu specified in the ACMSUDF.DAT database for the terminal user must be a menu that exists in the specified .MDB file.

- The terminal user's user name matches that of the agent handling the user, or the agent's user name is authorized with the **/AGENT** qualifier in the ACMSUDF.DAT database.

- The terminal user's user name must be less than or equal to 12 characters in length.

When these errors occur for *all* users typing an **ACMS/ENTER**, check these items:

- The file SYS$COMMON:[SYSEXE]RIGHTSLIST.DAT must exist on the system. If it does not, add the file with AUTHORIZE by entering:

```
UAF> CREATE/RIGHTS
```

- The command menu .MDB file, ACMSCMD.MDB, must be valid and exist in the ACMS$DIRECTORY disk directory.
- The ACMS menu request library file, ACMSREQ.RLB, must be valid and exist in the SYS$LIBRARY disk directory.
- The user name used by the Command Process (CP) and the Queued Task Initiator (QTI) must have been added as an agent in the ACMSUDF.DAT database. By default, this user name is SYSTEM.
- The application must be properly authorized for use in ACMS with the Application Authorization Utility (AAU).
- Check to be sure the .ADB file is valid by entering the following:

  ```
  $ RUN SYS$SYSTEM:ACMSADU
  ADU> DUMP APPLICATION <ADB-filename>
  ```

  If this command generates an error, then rebuild the application to create a new .ADB file.
- Check to see that the user name specified for the Terminal Subsystem Controller (TSC) has sufficient ASTLM quota.