OpenVMS VAX Version 7.2 Upgrade and Installation Manual

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This manual provides step-by-step instructions for upgrading and installing the OpenVMS VAX operating system.

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The OpenVMS documentation set is available on CD–ROM.

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Preface

Intended Audience

This manual is intended for anyone responsible for installing or upgrading the OpenVMS VAX operating system and for the startup, shutdown, and backup operations required on VAX computers running this software.

When to Use This Manual

If you received factory-installed software (FIS) with your VAX computer, refer to that user documentation to start up your system for the first time. Use this manual if you need to install or upgrade the OpenVMS VAX operating system software yourself or if you need to perform certain startup, shutdown, or backup operations. When the instructions in this manual direct you to do so, refer to the upgrade and installation supplement for information specific to your VAX computer.

Document Structure

This manual is organized as follows:

- Chapter 1 provides an overview of the upgrade and installation procedures. It describes what happens during an installation or an upgrade, lists some changes and restrictions you should be aware of, and refers you to the appropriate documentation.
- Chapter 2 describes the tasks you must perform before installing the operating system.
- Chapter 3 describes how to install the operating system on a VAXcluster or a standalone VAX computer.
- Chapter 4 describes the tasks you must perform after installing the operating system.
- Chapter 5 describes how to prepare your system for an upgrade.
- Chapter 6 contains additional information for upgrading a VAXcluster environment.
- Chapter 7 describes how to upgrade a standalone VAX computer.
- Chapter 8 describes the tasks you must perform after upgrading the operating system.
- Chapter 9 describes how to customize DECwindows device support software.
- Chapter 10 describes how to use VMSTAILOR and DECW$TAILOR to add or remove optional OpenVMS software.
- Appendix A provides a quick method of applying multiple upgrades to a VAX system.

- Appendix B contains supplementary information about registering licenses.
- Appendix C describes how to boot from the [SYSF] directory on the different types of VAX computers.
- Appendix D lists the subclasses in the OpenVMS VAX optional save sets C, D, E, and F.
- Appendix E lists DECwindows display server and font files.
- Appendix F lists files installed either over or under the version numbers of existing files during an upgrade.
- Appendix G describes how to prepare your OpenVMS system and your PC to run the OpenVMS Management Station server and client software.
- Appendix H describes methods for managing small capacity system disks, including some specific recommendations for installing or upgrading to the OpenVMS VAX Version 7.2 operating system and the DECwindows Motif for OpenVMS Version 1.2–3 layered product.
- The Glossary defines key terms used in this manual.

Related Documents

The following documents contain information associated with performing an upgrade or installation:

- All cover letters included with your kit.
- The upgrade and installation supplement for your VAX computer — Provides supplemental information necessary during an installation or upgrade, such as booting the system and determining device names.
- The *OpenVMS Version 7.2 Release Notes*, which provides important supplementary information about the OpenVMS VAX operating system.
- *OpenVMS Version 7.2 New Features Manual* — Describes new software features for the OpenVMS Version 7.2 operating system.
- *OpenVMS Cluster Systems* — Describes the procedures for establishing and managing VAXcluster configurations.
- The following Compaq networking software documents (if you plan to install and configure DECnet-Plus, DECnet Phase IV, or DIGITAL TCP/IP Services for OpenVMS software):
  - *DECnet-Plus for OpenVMS Installation and Basic Configuration*
  - *DECnet for OpenVMS Guide to Networking*
  - *DIGITAL TCP/IP Services for OpenVMS Installation and Configuration*

  Documentation for the Compaq networking products listed above are included on the OpenVMS Online Documentation CD–ROM. Hardcopy documentation must be purchased separately.
- *OpenVMS License Management Utility Manual* — Provides information about registering and managing licenses on an OpenVMS VAX system.
- *OpenVMS Guide to System Security* — Describes security features provided by the OpenVMS VAX operating system, including criteria for C2 systems.

- *OpenVMS System Manager's Manual* — Provides task-oriented information about managing an OpenVMS system, including how to use the VMSINSTAL command procedure.
- *OpenVMS DCL Dictionary* — Provides detailed reference information and examples for all OpenVMS DCL commands.
- *OpenVMS System Management Utilities Reference Manual: M–Z* — Provides complete information about using the POLYCENTER Software Installation utility PRODUCT command.
- The hardware manuals supplied with your VAX computer provide detailed information about system hardware.

For additional information on the Open Systems Software Group (OSSG) products and services, access the following OpenVMS World Wide Web address:

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Conventions

In this manual, any reference to OpenVMS is synonymous with DIGITAL OpenVMS.

Every use of OpenVMS VAX means the OpenVMS VAX operating system.

Every use of DECwindows and DECwindows Motif refers to DECwindows Motif for OpenVMS software.

The following conventions are also used in this manual:

Ctrl/*x*	A sequence such as Ctrl/*x* indicates that you must hold down 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 examples, a key name enclosed in a box indicates that you press a key on the keyboard. (In text, a key name is not enclosed in a box.) In the HTML version of this document, this convention appears as brackets, rather than a box.
. . .	A horizontal ellipsis in examples indicate 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 indicate 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.
( )	In command format descriptions, parentheses indicate that you must enclose the options in parentheses if you choose more than one.
[ ]	In command format descriptions, brackets indicate optional elements. You can choose one, none, or all of the options. (Brackets are not optional, however, in the syntax of a directory name in an OpenVMS file specification or in the syntax of a substring specification in an assignment statement.)
{ }	In command format descriptions, braces indicate required elements; you must choose one of the options listed.

bold text	This text style represents the introduction of a new term or the name of an argument, an attribute, or a reason. In the HTML version of this Conventions table, this convention appears as *italic text*.
italic text	Italic text indicates important information, complete titles of manuals, or variables. Variables include information that varies 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 TEXT	Uppercase text indicates a command, the name of a routine, the name of a file, or the abbreviation for a system privilege.
`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.
-	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.

This manual often refers to products by their abbreviated names. For example, the VAX 8200, VAX 8250, VAX 8300, and VAX 8350 computers are referred to as the VAX 8200, 8250, 8300, 8350. The MicroVAX 2000 computer is referred to as the MicroVAX 2000, and so on.

1
Getting Started

This chapter provides a general description of what happens during the installation and upgrade procedures, including information you should know before you install or upgrade to the OpenVMS VAX Version 7.2 operating system.

This chapter also describes the contents of the distribution kit, tells you whether you should do an installation or an upgrade, and refers you to the appropriate documentation.

1.1 Important Information

Before you install or upgrade to OpenVMS VAX Version 7.2, review the information in this section.

1.1.1 DIGITAL TCP/IP Services for OpenVMS VAX

DIGITAL TCP/IP Services Version 5.0 is available with the OpenVMS Alpha and VAX Version 7.2 operating system.

If you are using previous versions of TCP/IP Services, Compaq recommends that you upgrade to TCP/IP Version 5.0. Refer to the OpenVMS and TCP/IP release notes for additional information.

1.1.2 DECnet for OpenVMS VAX Software

From the OpenVMS VAX Version 7.2 operating system installation menu, you can choose either the DECnet-Plus or DECnet Phase IV networking software. Both DECnet products cannot run at the same time on your system. You must choose to install one or the other.

If you install or reinstall DECnet Phase IV, support is only available under Compaq's Prior Version Support Program. Contact your local Compaq support representative for additional information.

Documentation for DECnet Phase IV and DECnet-Plus is included on the OpenVMS Online Documentation CD–ROM. Hardcopy documentation for these products must be purchased separately. For more information about DECnet-Plus for OpenVMS, refer to the *DECnet-Plus for OpenVMS Release Notes* and *DECnet-Plus for OpenVMS Installation and Basic Configuration*.

1.1.3 DECwindows Motif for OpenVMS — Minimum Version

For OpenVMS VAX Version 7.2, the minimum supported version of DECwindows Motif for OpenVMS is 1.2–3.

1.1.4 MACRO32.EXE and Standalone BACKUP

To build standalone BACKUP onto tape, you must have the image MACRO32.EXE on your system disk. Do not tailor off (remove) the Macro libraries before building standalone BACKUP onto tape.

1.1.5 Layered Product Availability

The most current information about layered product support is available in the Software Public Rollout Reports for OpenVMS. These reports are available from the OpenVMS World Wide Web site in the ‘‘Publications’’ section. Use the following URL:

```
http://www.openvms.digital.com/openvms/os/swroll/index.html
```

If you do not have access to the Internet, you can find the operating system support information on any of the quarterly Software Products Libraries, in the following directory:

```
[README]SW_COMPAT_MATRIX.PS  (.TXT)
```

1.1.6 Restrictions

Restrictions for OpenVMS VAX Version 7.2 include:

- The minimum memory requirement for OpenVMS Vax Version 7.2 is 4 megabytes. Additional components, such as DECnet for OpenVMS VAX, DIGITAL TCP/IP Services, or VAXcluster, require more memory to ensure satisfactory performance.
- The MA780 shared memory is not supported.
- You cannot install or upgrade to the OpenVMS VAX Version 7.2 operating system on the following VAX computers and system disks:

Computers	MicroVAX I, VAXstation I, VAXstation 8000, VAX–11/725, and VAX–11/782
System disks	RK07, RL02, RC25, RD32, RD51, RD52, RD53, RZ22, RZ25, and RZ23L

- If your system uses a small-capacity system disk (less than 210 megabytes), the entire OpenVMS VAX Version 7.2 operating system *and* the complete DECwindows Motif for OpenVMS VAX layered product will not fit on your disk. Appendix H describes some methods that may enable you to install or upgrade to OpenVMS VAX Version 7.2 and DECwindows Motif for OpenVMS VAX on a small-capacity system disk.

  Note that you can use the methods described in Appendix H to free up disk space on any system.

For more information about these restrictions, refer to the *OpenVMS Operating System for VAX and Alpha, Version 7.2 Software Product Description (SPD)*.

1.2 Key Terms

You need to know the following key terms before you install or upgrade the system:

Term	Definition
Distribution media	The media containing the OpenVMS VAX operating system software.

Term	Definition
System disk	The disk that contains (or will contain) the OpenVMS VAX operating system. The installation or upgrade procedure transfers the OpenVMS operating system from the operating system CD–ROM on the source drive to the system disk.
Local drive	A drive that is connected directly to a VAX computer. For example, a magnetic tape drive connected directly to a VAX computer is referred to as a local tape drive. If you have a standalone VAX computer, it is likely all the drives connected to your system are local drives.
InfoServer	A general-purpose disk storage server that allows you to use the distribution compact disc to install the operating system on remote client systems connected to the same LAN (local area network).
Source drive	The drive that holds the distribution media during the upgrade or installation.
Target drive	The drive that holds the system disk—or, for some files, the alternate disk—during the upgrade or installation.
HS*x* device	A self-contained, intelligent, mass storage subsystem that lets computers in a VAXcluster environment share disks. The disk on which you install or upgrade the operating system can be connected to one of these systems (for example, an HSC or HSD).

For definitions of other specialized terms used in this manual, see the Glossary at the end of this book.

1.3 Locating Files on the Distribution Media

The OpenVMS VAX files are stored on the distribution media as the following save sets:

Save-Set Name	Description
VMS072.A	Used for upgrades
VMS072.B	Required
VMS072.C	Library (optional)
VMS072.D	Optional (optional)
VMS072.E	Help Message (optional)
VMS072.F	OpenVMS Management Station software PC files (optional)

See Appendix D for descriptions of the file subclasses contained in the optional save sets.

The optional DECwindows support files are stored on the distribution media as the following save sets:

Save-Set Name	Description
DECW072.C	Base support files
DECW072.D	Workstation support files

Save-Set Name	Description
DECW072.E	75 dots-per-inch (dpi) font files
DECW072.F	100 dpi font files

1.3.1 On CD–ROM

The OpenVMS VAX Version 7.2 CD–ROM contains all the save sets and DECwindows base and workstation support files on one compact disc. You can install or upgrade the operating system from a local compact disc drive as well as from an InfoServer device. (For more information, refer to the *Guide to OpenVMS Version 7.2 CD–ROMs*.)

The CD–ROM is labeled similar to the following:

CD–ROM Label:	OpenVMS VAX Operating System 7.2
Volume Label:	VAXVMS072

Note

The *volume label* is the machine-readable name that the OpenVMS VAX operating system and InfoServer systems use to access the CD–ROM.

1.3.2 On Magnetic Tape or Tape Cartridges

The OpenVMS VAX Version 7.2 kit is available on two, 6250 BPI, open reel magnetic tapes or on two TK50 CompacTape cartridges. (Earlier versions of OpenVMS VAX shipped on four magnetic tapes.)

The first tape or cartridge contains the VMS072.A, VMS072.B, and VMS072.C save sets. The second tape or cartridge contains standalone BACKUP (TK50 tape cartridge only), the VMS072.D, VMS072.E, and VMS072.F save sets, and the DECW072.C, DECV072.D, DECW072.E, and DECW072.F save sets.

Note

Standalone BACKUP is not available on open reel magnetic tape. If you are installing from magnetic tape and want to use standalone BACKUP, you must boot standalone BACKUP from another media.

1.3.3 DECamds and Monitoring Performance History (MPH) Files

The DECamds software (AMDS) is included on the OpenVMS VAX distribution media. The AMDS kit is located on the second magnetic tape or TK50 CompacTape cartridge, and on the compact disc in the [AMDS072] directory.

The Monitoring Performance History (MPH) kit is also included on the OpenVMS VAX distribution media. The MPH kit is located on the second magnetic tape or TK50 CompacTape cartridge and on the compact disc in the [MPH] directory.

1.3.4 Software Product Descriptions (SPDs)

If your distribution kit is on compact disc, the SPD files are located in the [DOCUMENTATION.V072] directory. For information about locating and printing these SPD files, refer to the *Guide to OpenVMS Version 7.2 CD–ROMs*.

The following SPD files are located on the second TK50 CompacTape cartridge and the second magnetic tape. These SPD files have been grouped into an OpenVMS BACKUP save set named VMS072_SPD.BCK. File names with the .PS extension are in PostScript format. File names with the .TXT extension are in ASCII (plain text) format.

DECNET_SPD.PS DECNET_SPD.TXT	*DECnet-Plus for OpenVMS VAX and Alpha, Version 7.2*
RMS_SPD.PS RMS_SPD.TXT	*RMS Journaling for OpenVMS*
CLUSTER_SPD.PS CLUSTER_SPD.TXT	*OpenVMS Cluster Software*
VOL_SHAD_SPD.PS VOL_SHAD_SPD.TXT	*Volume Shadowing for OpenVMS*

To obtain all the SPD files and restore them to your current default directory, enter a BACKUP command using the following format:

```
BACKUP source-drive:VMS072_SPD.BCK /SAVE_SET *.*;*
```

For *source-drive*, substitute the name of the device that holds your distribution kit. For example, if your *source-drive* is a local magnetic tape drive with the device name MUAO, you would enter the following command:

```
$ BACKUP MUAO:VMS072_SPD.BCK/SAVE_SET *.*;*
```

To restore all the SPD files in PostScript format to your default directory, enter the following:

```
$ BACKUP MUAO:VMS072_SPD.BCK/SAVE_SET/SELECT=*.PS *.*;*
```

The following command restores the PostScript SPD file for the OpenVMS VAX and OpenVMS Alpha operating systems to your current default directory:

```
$ BACKUP MUAO:VMS072_SPD.BCK/SAVE_SET/SELECT=OVMS_72_SPD.PS *.*;*
```

1.4 What Happens During an Installation

When you install the OpenVMS VAX operating system, the installation procedure does the following:

- Initializes the system disk, overwriting its contents.
- Creates a system directory structure.
- Transfers the OpenVMS VAX files from the distribution media to the system disk.

1.4.1 When to Perform an Installation

Use the installation procedure under the following conditions:

- If your VAX computer is new (it has never had any version of the operating system running on it, including factory-installed software).
- If your VAX computer is running a previous version of the operating system and you want to overwrite the entire contents of the system disk (the OpenVMS VAX operating system, application software, and user files).
- If you are running a previous version of the operating system, but you cannot upgrade. For example, if you changed the names of system directories on the system disk, the upgrade procedure will not work correctly. You can either restore the system disk to its original directory structure, or you can reinstall the OpenVMS VAX operating system.

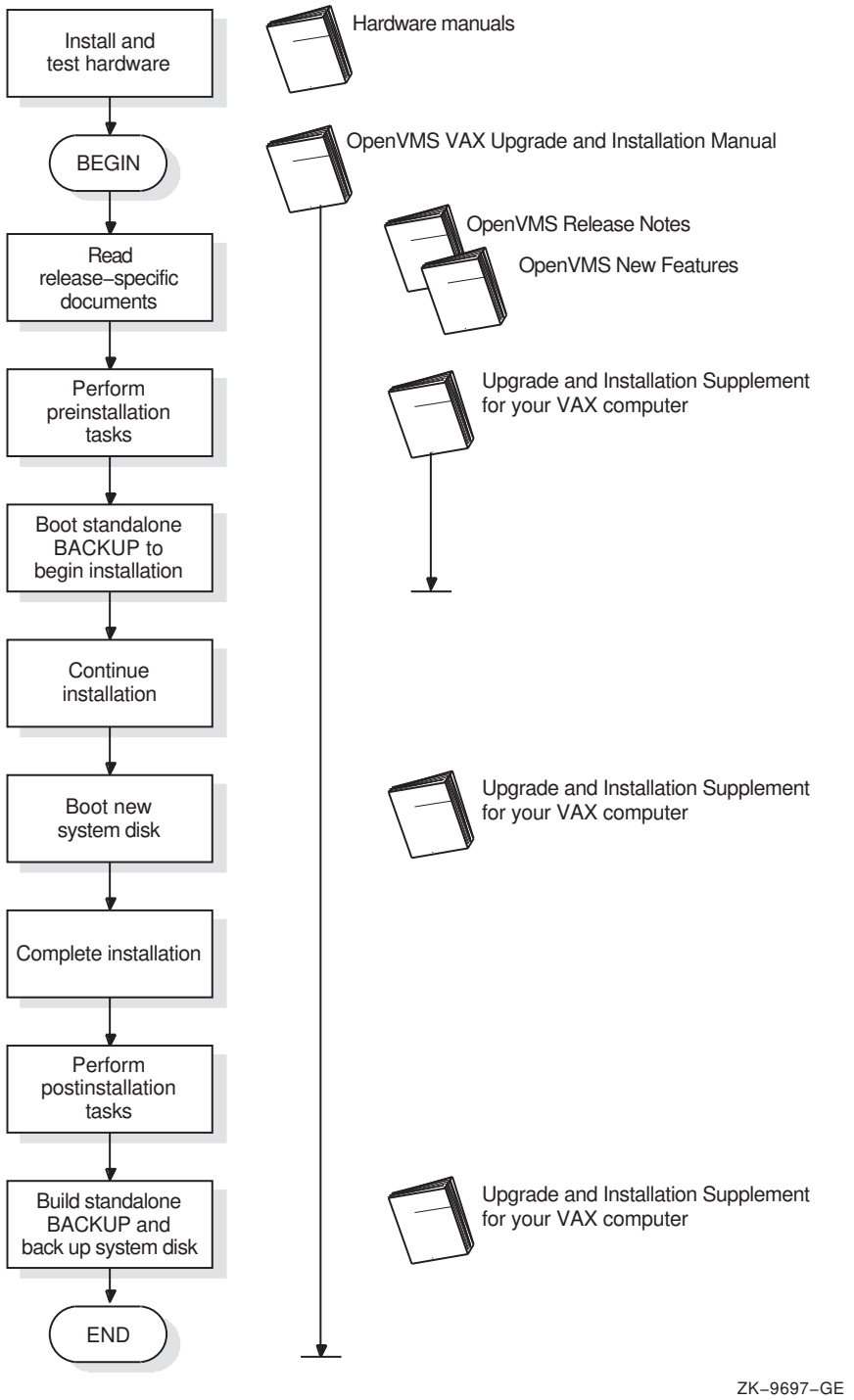
Caution

The installation procedure initializes the system disk, overwriting its contents. For this reason, use the installation procedure only on new VAX computers or if you want to destroy the contents of the system disk.

1.4.2 How to Use the Installation Documentation

This manual contains step-by-step instructions for performing an OpenVMS VAX installation. However, you will need to refer to several different documents before and during the installation. Figure 1–1 illustrates the major steps in an installation and the documents you will use to perform each step.

Figure 1–1 Documentation Used to Perform an Installation



1.5 What Happens During an Upgrade

When you upgrade the OpenVMS VAX operating system, the upgrade procedure does the following:

- Deletes and purges some OpenVMS VAX files on the system disk but leaves all the user files intact.
- Transfers the new OpenVMS VAX files from the distribution media to the system disk.

Note

The upgrade procedure puts the most recent versions of the OpenVMS VAX files in the system common directories (SYS$COMMON). The upgrade procedure does not replace or delete any versions of these files in the system-specific directories (SYS$SPECIFIC). If there are previous versions of OpenVMS VAX files in the system-specific directories, the upgrade procedure or the upgraded system may not work correctly.

- Merges some of the old OpenVMS files and the new OpenVMS VAX files and replaces others.

  Certain OpenVMS VAX files are placed either over or under existing files (that is, they are given a version number above or below the version number of the existing file). This protects any customizations to the files and results in having two versions of the file when the upgrade is completed. For more information, see Appendix F.
- Cleans up files and structures used only during the upgrade.
- Leaves your OpenVMS license and System Integrated Product (SIP) licenses intact.

  You do not need to reinstall these licenses after you upgrade. (Refer to Appendix B for detailed information about license management for OpenVMS VAX Version 7.2.)

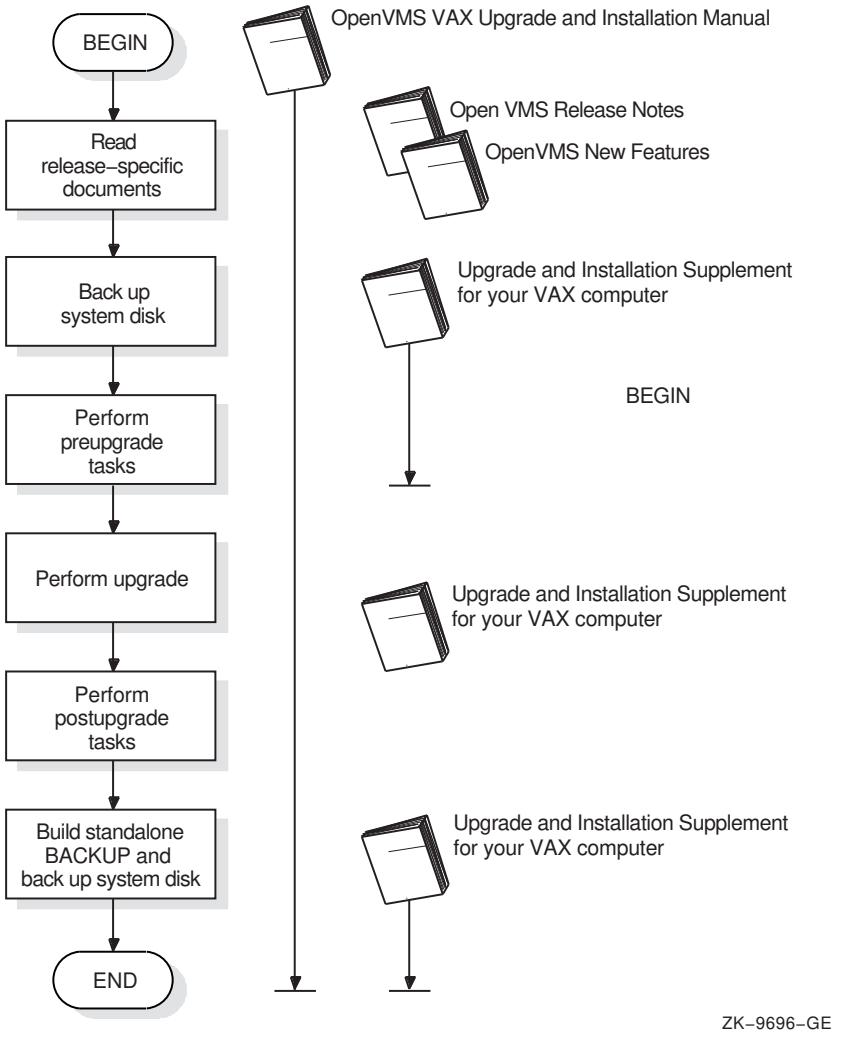
1.5.1 When to Perform an Upgrade

In most cases, you can use the upgrade procedure to obtain a higher version of the OpenVMS VAX operating system. Unlike the installation procedure, the upgrade procedure does not initialize your system disk. This means you can get the latest version of the operating system and keep your user files and optional software files intact.

1.5.2 How to Use the Upgrade Documentation

This manual contains step-by-step instructions for performing an OpenVMS VAX upgrade. However, you will need to refer to several different documents before and during an upgrade. Figure 1–2 illustrates the major steps in an upgrade and the documents you will use to perform each step.

Figure 1–2 Documentation Used to Perform an Upgrade



1.6 What to Do Next

If you want to install the OpenVMS VAX operating system, go to Chapter 2.

If you are upgrading the OpenVMS VAX operating system, go to Chapter 5.

2

Preparing to Install the OpenVMS VAX Operating System

This chapter describes how to prepare for installing the OpenVMS VAX operating system, including:

- Being aware of the cautions and restrictions
- Ensuring your hardware is ready
- Ensuring your software distribution kit is complete
- Preparing for a VAXcluster environment
- Preparing your tape and disk drives
- Gathering the information you need to supply during the installation procedure
- Completing the preinstallation checklist

If you are an experienced system manager, you can use the checklist at the end of the chapter to complete all the necessary preinstallation tasks.

If you are a less-experienced system manager, you should read the entire chapter and then use the checklist to make sure you completed all the preinstallation tasks.

2.1 Cautions and Restrictions

Before you begin the installation procedure, note the following cautions and restrictions.

2.1.1 Cautions

The following cautions apply for Version 7.2 of the OpenVMS VAX operating system:

- The software installation procedure overwrites the contents of the system disk. Use the installation procedure only if your VAX computer is new or if you want to destroy the contents of the system disk. If your system disk contains files you want to save, you should *upgrade* to the new version of OpenVMS VAX. For an overview of the upgrade procedure, see Chapter 5.
- Do not attempt to use VMSINSTAL with OPTION G to transfer OpenVMS VAX save sets to another media type; doing so produces an unusable system. Instead, you can use the DCL command COPY to transfer save sets to another media type.

  If you move the save sets from the distribution media before beginning the installation, you must move them to the [000000] directory on a disk that is *not* the system disk; otherwise, the installation will fail.

2.1.2 Restrictions

The following restrictions apply for Version 7.2 of the OpenVMS VAX operating system:

- If your system contains DIGITAL Storage Systems Interconnect (DSSI) disks attached to a KFQSA controller, you will notice a change in the device names for DSSI disks attached to KFQSA controllers.

  When you boot standalone BACKUP, it displays the devices on your system using the *new* device naming scheme. Use the new device names throughout the installation and after you complete the installation.

- If you want to use DECwindows software with OpenVMS VAX Version 7.2, you must purchase and install the DECwindows Motif for OpenVMS Version 1.2–3, or higher, layered product. For more information, see Section 1.1.2.

2.2 Examining Software and Hardware Components

Before beginning an installation or upgrade, be sure you have all the required hardware and software components, as described in the following sections.

2.2.1 Hardware Components

Before you begin an installation or upgrade, do the following:

- Be sure the hardware has been installed and checked for proper operation. For detailed information, refer to the hardware manuals you received with your VAX computer.
- Be sure you know how to turn on and operate the components of your system, including the system unit, console, monitor, drives, terminals, and printers. If necessary, read the hardware manuals that came with these components.
- Set up your system to record the installation procedure on either a hardcopy terminal or a printer attached to the console terminal. (Refer to your hardware manuals for more details about connecting those components to your system.) If you do not do this, the screen messages will be lost. You need a transcript in case there is a problem during the installation.

2.2.2 Software Components

Before you begin an installation or upgrade, do the following:

- Be sure you have all the items listed on the bill of materials in the distribution kit. If your distribution kit is incomplete, notify your Compaq support representative and request priority shipment of any missing items.
- Before installing the OpenVMS VAX operating system software, review all cover letters and release notes.
- Read the Before Installing OpenVMS section in the installation and upgrade supplement for your VAX computer, which describes tasks specific to your VAX computer that you must complete before beginning the installation.

2.3 Preparing for an Installation

Now that you have determined that your hardware and software components are ready, you can make the necessary preparations for installing the OpenVMS VAX operating system.

2.3.1 Preparing for a VAXcluster Environment

If you are installing the OpenVMS VAX operating system in a VAXcluster environment, the installation procedure displays information about cluster configuration. But, because there is no network present on the system at this point in the procedure, no cluster configuration work can actually be performed at this time. Before proceeding, review *OpenVMS Cluster Systems*, which provides the information you need to answer questions during the installation.

Note

Entering incorrect information during the installation can force you to repeat the entire installation procedure.

Table 2–1 lists the VAXcluster information you need and explains how to obtain that information. For a complete explanation, refer to *OpenVMS Cluster Systems*.

Table 2–1 VAXcluster Information for Installations

Information You Need	How to Get It
Type of configuration	Configuration types are distinguished by the interconnect device that the VAX computers in the cluster use to communicate with one another: Computer Interconnect (CI), Ethernet, DIGITAL Storage Systems Interconnect (DSSI), or FDDI (Fiber Distributed Data Interface).
DECnet node name and node address	Determined by the network or system manager for each VAX computer on the network. See your system or network manager for the DECnet node name and node address for the VAX computer on which you are installing the OpenVMS VAX operating system. Refer to the *DECnet-Plus for OpenVMS Installation and Configuration* manual for more information.
Allocation class value	During the installation procedure you are asked for the ALLOCLASS value of the VAX computer on which you are installing the OpenVMS VAX operating system. For example: `Enter a value for MYNODE's ALLOCLASS parameter:` Refer to *OpenVMS Cluster Systems* for the rules on specifying allocation class values. Note that, in a mixed-interconnect VAXcluster environment, the allocation class value cannot be zero. It has to be a value between 1 and 255. This is also true for any VAX computer connected to a dual-pathed disk. When you enter the allocation class value, the installation procedure uses it to set the value of the ALLOCLASS system parameter automatically.
Quorum disk	Refer to *OpenVMS Cluster Systems* to determine whether you want a quorum disk in the cluster.
Location for page and swap files	Refer to *OpenVMS Cluster Systems* to determine where the page and swap files will be located for the system from which you are installing the OpenVMS VAX operating system software.
MOP servers, disk servers, tape servers	To establish either a local area or a mixed-interconnect cluster, determine which systems will be Maintenance Operations Protocol (MOP) servers, disk servers, and tape servers. Refer to *OpenVMS Cluster Systems*.

(continued on next page)

Table 2–1 (Cont.) VAXcluster Information for Installations

Information You Need	How to Get It
Cluster group number and cluster password	To establish either a local area or a mixed-interconnect cluster: • Cluster group number - A number in the range from 1 to 4095 or from 61440 to 65535 • Cluster password - Can range from 1 to 31 alphanumeric characters, including dollar signs ($) and underscores (_)

2.3.2 Preparing Tape and Disk Drives

Prepare your tape and disk drives using the following steps:

1. Decide which drive will hold the distribution media and which drive will hold the system disk. Determine the device names for each drive. You will need this information throughout the installation. If you need information about devices and device names, refer to the Before Installing the OpenVMS Operating System section in the upgrade and installation supplement for your VAX computer.

   Note

   Do not place the distribution media in the drive at this point.

2. Follow this step only if the **source drive** or **target drive** is attached to an HS*x* device. Otherwise, go to step 3.

   Make sure that both the CI and HS*x* devices are turned on and are on line. Obtain the HS*x* name from the system manager, or use the following procedure:

   a. Press Ctrl/C at the HS*x* console terminal.

   b. Enter the following command at the HS*x*> prompt and press Return:

   ```
   HSx> SHOW SYSTEM
   ```

   The information displayed includes the name of the HS*x*. For example:

   ```
   11-SEP-1998 15:00:00.00 Boot:11-SEP-1998 11:31:11.41  Up: 51:00
   Version V350          System ID: %X000000011       Name: MUTT
         .
         .
         .
   DISK allocation class = 1 TAPE allocation class = 0
   Start command file Disabled

   SETSHO - Program Exit
   ```

   For more information, refer to the *HSx User's Guide*.

3. Place a **scratch disk** in the drive for the system disk (unless the system disk is fixed).

4. Spin up the disk that will be the system disk but *do not* write protect it.

2.3.3 Information You Need During the Installation

During the installation, the procedure prompts you to supply certain information. To save time once the procedure begins, be sure you have the following information available. Remember, entering incorrect information during the installation could force you to repeat the entire installation procedure.

Required Information	Explanation
Passwords	You will be prompted to type passwords of at least 8 characters for the SYSTEM, SYSTEST, and FIELD accounts.
SCSNODE and SCSSYSTEMID parameters	You will be prompted to supply an SCSNODE name and an SCSSYSTEMID system parameter. The SCSNODE name must be a 1- to 6-character name; the SCSSYSTEMID system parameter is a number in the range of 1025 to 65535. If you will be using DECnet Phase IV or DECnet-Plus with Phase IV compatible addresses, then SCSNODE must be the DECnet node name, and SCSSYSTEMID must be calculated from the DECnet address as follows: (DECnet-area * 1024) + DECnet-node-number
Optional components and OpenVMS Management Station files	The installation procedure prompts you to specify whether you want to install the library (VMS072.C), optional (VMS072.D) OpenVMS components, and OpenVMS Management Station software PC files (VMS072.F). Appendix D lists the files included in these save sets. You can save some space on your system disk if you choose *not* to install these components, but be sure to review Appendix D before deciding.
Location for Help Message utility	Save set VMS072.E contains the online Help Message utility, which you can install on your system disk or on an alternate disk. (However, if you copied the distribution kit to some other media from which you will be performing the installation, you cannot install this save set on that media.)

Required Information	Explanation
DECwindows components	The installation procedure prompts you to specify which of the following DECwindows components you want to install: • DECwindows base support (required for running DECwindows software), which includes: – DECwindows transport – DECwindows keymaps • DECwindows workstation support (required for VAX workstations), which includes: – DECwindows X11 display server – Graphics drivers – 75 dots/inch video fonts – 100 dots/inch video fonts (option available only if you select DECwindows workstation support) You must install the DECwindows Motif for OpenVMS (previously called VMS DECwindows Motif) layered product if you want to run the DECwindows software. DECwindows Motif for OpenVMS Version 1.2–3 (or 1.2 if the VAXMOTF05_012 remedial kit is installed) is the minimum supported version for systems running OpenVMS VAX Version 7.2. If you do not know which version of DECwindows Motif you are currently running on your system, you can check by entering the following command: `$ ANALYZE/IMAGE SYS$LIBRARY:DECW$XLIBSHR.EXE` Note that the DECwindows Motif for OpenVMS layered product does *not* have the DECwindows base and workstation support components. To get full DECwindows support, you must select the DECwindows components provided with the OpenVMS VAX kit and install the separate DECwindows Motif for OpenVMS layered product, which supports both Motif and XUI environments.
PAK information	The information listed on Product Authorization Keys (PAKs) for your OpenVMS VAX license and any system integrated products you will run. The installation procedure gives you the opportunity to register any licenses you have. To register your licenses, you will need to enter the information listed on the PAK for each license.

2.4 Preinstallation Checklist

Before you begin the installation, use the following checklist to make sure you have completed all of the tasks described in this chapter:

- ☐ Read the cautions and restrictions described at the beginning of this chapter.
- ☐ Make sure the hardware is installed and tested. (Described in the hardware manuals for your VAX computer)
- ☐ Check the contents of your kit against the bill of materials (BOM).
- ☐ Read Appendix B of this manual, the *OpenVMS Version 7.2 New Features Manual*, the *OpenVMS Version 7.2 Release Notes*, and any cover letters included with your kit.
- ☐ Turn on the system. (Described in the upgrade and installation supplement for your VAX computer)
- ☐ Set up your system to record the installation procedure. (Described in the upgrade and installation supplement for your VAX computer)
- ☐ Read the Before Installing OpenVMS section in the upgrade and installation supplement for your VAX computer and perform the tasks described there.
- ☐ Make sure you have the most recent version of the console media if you have a VAX computer that uses console media. (Described in the upgrade and installation supplement for your VAX computer)
- ☐ Determine whether you want a CI only, local area, or mixed-interconnect cluster if you are installing the OpenVMS VAX operating system on a VAX computer in a VAXcluster environment. (Described in *OpenVMS Cluster Systems*)

  You should have the following information, depending on the type of VAXcluster:

  - CI Only VAXcluster: Get the allocation class value, DECnet node name, and DECnet node address for the computer. You also need to decide if you want a quorum disk and where the page and swap files for the system from which you are installing will be located.
  - Local Area and Mixed-Interconnect VAXclusters: Get the allocation class value, the DECnet node name, the DECnet node address, the cluster group number, and the cluster password. You also need to decide if you want a quorum disk and where the page and swap files for the system from which you are installing will be located.

- ☐ Prepare the disk and tape drives. (Described in Section 2.3.2)
- ☐ Make sure you have the following information (described in Section 2.3.3) available:

  - Passwords containing at least 8 characters for the SYSTEM, SYSTEST, and FIELD accounts.
  - SCSNODE and SCSSYSTEMID if you are installing a standalone system.

- A list of optional OpenVMS VAX components you want to install.
- A list of optional DECwindows support components you want to install.
- Information listed on Product Authorization Keys (PAKs) for your OpenVMS VAX license and any system integrated products you will run.

After you have performed all the tasks in the checklist, go to Chapter 3 to begin the installation.

3
Installing the OpenVMS VAX Operating System

During the installation procedure, OpenVMS VAX files are transferred from the distribution media to the system disk or, for certain files, to an alternate disk. The time required to complete an installation varies depending on your hardware configuration and on the distribution media you are using. In most cases, magnetic tapes and tape cartridges require more time than compact discs.

This chapter describes the following installation tasks:

- Booting standalone BACKUP
- Creating the system disk
- Configuring a cluster
- Setting passwords
- Creating the rights database
- Registering licenses
- Running AUTOGEN

At certain points in the procedure you will need to refer to the upgrade and installation supplement for installation instructions that are specific to your VAX computer.

3.1 Booting Standalone BACKUP

Standalone BACKUP is a subset of the OpenVMS Backup utility (BACKUP). Because you boot it into main memory, standalone BACKUP executes outside the control of the operating system. You use standalone BACKUP to restore the *required* save sets from the distribution media to your system disk.

To boot a standalone BACKUP environment, enter the following:

```
>>> B DKA400
```

Standalone BACKUP is included in the OpenVMS VAX distribution kit. Each piece of media in the distribution kit has a label that indicates its contents. For example, there are two CompacTape cartridges in a TK50 kit. Standalone BACKUP is on the second tape cartridge.

3.1.1 Booting from Tape Cartridge

If your distribution media is contained on TK50 CompacTape cartridges, complete the following steps to boot standalone BACKUP. (If you are using an InfoServer device, go to Section 3.1.2.)

1. Place the media that contains standalone BACKUP in the source drive or in the console drive.

2. Follow the instructions in the Booting Standalone BACKUP section of the upgrade and installation supplement for your VAX computer.
3. After you boot standalone BACKUP, the system displays the following message:

```
%BACKUP-I-IDENT, standalone BACKUP V7.2; the date is 13-NOV-1998 10:00
$
```

Note

If you have a tape cartridge kit, remove the tape cartridge 2/2 from the drive after you boot standalone BACKUP. Put the tape cartridge that contains the OpenVMS VAX operating system in the drive. The tape cartridge is labeled *VMS072 BIN TK50 1/2 VMS BINARY*.

After you have booted standalone BACKUP, go to Section 3.2.

3.1.2 Booting from the InfoServer

If you are using the InfoServer to boot standalone BACKUP from a compact disc, complete the following steps:

1. Insert the distribution compact disc into the drive.
2. Follow the instructions in the Booting Standalone BACKUP section of the upgrade and installation supplement for your VAX computer.
3. Enter your VAX processor boot command by using the designator for the Ethernet adapter in the boot path and, except for the VAX 9000 computer, add the /R5:100 qualifier to the boot command.

   For example, on a VAX 6000 computer, enter:

   ```
   >>> B/R5:100/X:D/B:6 ET0
   ```

   On VAX 9000 computers, standalone BACKUP resides on the console hard disk. Because the boot process is slightly different for each type of controller, each supported controller has a unique boot command procedure. Refer to the upgrade and installation supplement for your VAX 9000 computer for instructions for booting standalone BACKUP on your system.
4. During an InfoServer boot, the procedure prompts you for a file name that contains an initial system load (ISL) boot program instead of a virtual memory boot (VMB) program. Select one of the two files as follows:

   - ISL_SVAX_072
   - ISL_LVAX_072

   Use the following table to determine which file name and boot path designator to use for your processor. Note that the VAX 9000 computer has the ISL file data built in its VMB image that runs from the console.

Processor Series	ISL File	Boot Path Designator
VAX 3000	ISL_SVAX_072	ESA0 (LANCE), XQA0 (DELQA)
VAX 4000	ISL_SVAX_072	EZA0 (SGEC), XQA0 (DELQA)

Processor Series	ISL File	Boot Path Designator
VAX 6000	ISL_LVAX_072	EXA0 (DEMNA), FXA0 (DEMFA), ETA0 (DEBNI) (DEBNA)
VAX 7000	ISL_LVAX_072	EXA0 (DEMNA), FXA0 (DEMFA)
VAX 10000	ISL_LVAX_072	EXA0 (DEMNA), FXA0 (DEMFA)
MicroVAX	ISL_SVAX_072	ESA0 (LANCE), XQA0 (DELQA)
VAXstation	ISL_SVAX_072	ESA0 (LANCE)
VAXft 110, 310, 410, 610, and 612	ISL_SVAX_072	EPA0 (LANCE)

On a VAX 6000 computer, respond to the prompt as shown in the following example:

```
Loading system software.

Filename: ISL_LVAX_072
```

5. The InfoServer ISL program then displays the following menu:

```
  Network Initial System Load Function
  Version 1.2

    FUNCTION         FUNCTION
      ID
      1     -        Display Menu
      2     -        Help
      3     -        Choose Service
      4     -        Select Options
      5     -        Stop

 Enter a function ID value: 3
```

Enter 3, as shown in the previous display, for the function ID value. The following menu is displayed:

```
    OPTION           OPTION
      ID
      1     -        Find Services
      2     -        Enter known Service Name

 Enter an Option ID value: 2
```

Enter 2 for the Option ID value. The following is displayed:

```
 Enter a Known Service Name:
```

Enter the ISL file name for your processor series from the previous table.

If you need more information, select function ID 2 for help.

6. After you boot standalone BACKUP, the system displays the following:

```
%BACKUP-I-IDENT, standalone BACKUP V7.2; the date is 11-NOV-1998 10:00
$
```

After you have booted standalone BACKUP, go to Section 3.2.

3.1.3 Booting from the CD–ROM

If you are installing from the OpenVMS VAX operating system CD–ROM (your VAX computer supports booting from a local CD–ROM or from an InfoServer), you can use the full OpenVMS environment instead of the standalone BACKUP environment to transfer the VMS072.B save set to your target system disk.

Although it may take slightly longer to boot OpenVMS than to boot standalone backup, you might prefer the more robust OpenVMS environment. It provides a greater range of commands and utilities than the standalone BACKUP environment.

If you want to use the full OpenVMS environment, follow these steps:

1. Boot the CD–ROM and specify root 1. For example, from a local drive on a VAXstation 4000 computer, enter:

   ```
   >>> B/R5:10000000 DKA400:
   ```

   If you are booting from an InfoServer device, enter a command that specifies root 1. For example, on a VAX 6000 compute, enter:

   ```
   >>> B/R5:10000100/X:D/B:6 ET0
   ```

2. After you boot the OpenVMS CD–ROM, the system displays the following menu:

   ```
       1)  Execute DCL commands and procedures
       2)  Shut down this system
   ```

   Choose option 1 to execute DCL commands and procedures.

   The system displays a triple dollar sign ($$$) DCL prompt to indicate that you are in this specialized DCL environment.

   You can ignore the following SYSINIT errors if they appear:

   ```
   %SYSINIT-E, %SYSINIT, error opening system dump file, status = 00000910
   %SYSINIT, primary PAGEFILE.SYS not found; system initialization continuing
   %SYSINIT, no dump file - error log buffers not saved
   %SYSINIT-E, error mounting system device, status = 007282EC
   ```

   Important Note

   During the installation, do not change the displayed system time, even if it is incorrect. Attempting to change this value results in a write lock error that requires a CD reboot.

3. Go to Section 3.2.3 to transfer the VMS072.B save set to your system disk.

3.2 Creating the System Disk

You create an OpenVMS VAX Version 7.2 system disk by transferring OpenVMS VAX files from the distribution media to your system disk. (For certain files, you have the option to transfer the files to your system disk or to an alternate disk.)

To transfer the OpenVMS VAX files from the distribution kit to your system disk, perform the steps described in the sections that follow.

3.2.1 Determining Device Names

If you have not already done so, determine the device names for the source drive, the target drive, and an alternate device if you will be using one. Write these names on a piece of paper. You will need this information throughout the installation. If either the source drive or the target drive is connected to an HSC, you also need the name of the HSC. (To determine the value for *hsc-name*, see Section 2.3.2 in Chapter 2.)

If you need more information about determining the device names for your system, refer to the upgrade and installation supplement for your VAX computer.

3.2.2 Loading Distribution Media

Each piece of media in the distribution kit has a label that indicates its contents. Place the media that contains the OpenVMS VAX operating system in the *source-drive*.

If your OpenVMS VAX distribution kit consists of more than one piece of media, place the first piece of media in the *source-drive*. For example, if you have a TK50 CompacTape cartridge kit, make sure the first tape is in the *source-drive*.

If you are installing from a compact disc, disc one of two is already in the drive.

3.2.3 Transferring VMS072.B to Your System Disk

Enter a BACKUP command in the following format to transfer the VMS072.B save set to your system disk:

```
$ BACKUP/IMAGE/VERIFY [hsc-name]source-drive:VMS072.B/SAVE_SET-
_$ [hsc-name]target-drive:
```

Important Note

If you are using the full OpenVMS environment as described in Section 3.1.3, you will see a triple dollar sign ($$$) instead of a single dollar sign ($). In this environment, you must first mount the target drive with the /FOREIGN qualifier before performing a BACKUP:

```
$$$ MOUNT/FOREIGN target-drive:
```

The BACKUP command must contain the directory specification [0,0] after the source drive to find the saveset:

```
$$$ BACKUP/IMAGE/VERIFY [hsc-name]source-drive:[0,0]VMS072.B/SAVE_SET-
_$$$[hsc-name]target-drive:
```

Substitute the appropriate device names for *hsc-name* (if appropriate), *source-drive*, and *target-drive*. Make sure you put a colon (:) after each device name and that you use zeros rather than the letter ''O'' in the device names and in VMS072.

The square brackets ([]) indicate that you need the *hsc-name* only if the device is connected to an HSC.

For example, if your system has a *source-drive* that is a local TU80 magnetic tape drive with a device name of MUA0 and a *target-drive* that is an RA82 disk drive with a device name of DUA1, enter the following command and press Return:

```
$ BACKUP/IMAGE/VERIFY MUA0:VMS072.B/SAVE_SET DUA1:
```

If your system has a *source-drive* that is a local tape cartridge drive with a device name of MUC6 or a *target-drive* that is an RA81 disk drive with a device name of DUA1 and an HSC name of YOURS, enter the following command and press Return:

```
$ BACKUP/IMAGE/VERIFY MUC6:VMS072.B/SAVE_SET YOURS$DUA1:
```

The procedure transfers the VMS072.B save set from the distribution kit to the system disk.[1] The amount of time this takes varies depending on the type of VAX computer and distribution media you have. During the process, the command displays the following message:

```
%BACKUP-I-STARTVERIFY, starting verification pass
```

This message indicates that the VMS072.B save set has been transferred to the system disk and the files are being checked for errors. If, instead, you see a message similar to the following, you might have the wrong volume of the distribution kit in the source drive:

```
% BACKUP-F-OPENIN, error opening  MUA0:[000000]VMS072.B; as
  input
- SYSTEM-W-NOSUCHFILE, no such file
   .
   .
   .
If you do want to perform another standalone BACKUP operation,
ensure the standalone BACKUP volume is on line and ready.
Enter "YES" to continue:
```

If the procedure displays the previous messages, remove the distribution volume from the drive and replace it with the correct volume as described in Section 3.2.2. Then type Yes, press Return, and repeat this step.

Completing the Transfer Operation

Complete the transfer of the VMS072.B save set to your system disk by performing one of the following operations:

- If you are using standalone BACKUP to transfer the VMS072.B save set, the procedure displays the following message when it has completed checking files:

  ```
  %BACKUP-I-PROCDONE, Operation completed. Processing finished at 13-NOV-1998  10:00.
  If you do not want to perform another standalone BACKUP operation,
  use the console to halt the system.

  If you do want to perform another standalone BACKUP operation,
  ensure the standalone application volume is on line and ready.
  Enter "YES" to continue:
  ```

  Go to Section 3.2.4 to boot the new system disk.

- If you are using the specialized OpenVMS environment to transfer the VMS072.B save set, the system displays the triple dollar sign ($$$) DCL prompt after the BACKUP operation completes. Enter the command LOGOUT to return to the menu. For example:

  ```
  $$$ LOGOUT

      1)  Execute DCL commands and procedures
      2)  Shut down this system
  ```

[1] The BACKUP command creates a system disk that includes a set of volume parameters provided by Compaq, including the CLUSTER_SIZE parameter (disk access scheme). For more information, refer to the upgrade and installation supplement for your VAX computer.

You can then choose option 2 to shut down the system in preparation for booting the new system disk, as described in Section 3.2.4.

3.2.4 Booting the New System Disk

Halt the system and boot the new system disk, as described in the upgrade and installation supplement for your VAX computer.

When the boot is completed, the procedure displays a message and prompts you to enter the date and time. Enter the date and time using the 24-hour clock format and press Return.

For example:

```
OpenVMS (TM) VAX Version V7.2 Major version id = 1 Minor version id = 0

        OpenVMS VAX V7.2 Installation Procedure

                    Model: VAXstation 3100-M76/SPX
              System device: RZ26 - _DKB100:
                Free blocks: 1984383
                   CPU type: 11-04

* Please enter the date and time (DD-MMM-YYYY HH:MM) 13-NOV-1998 10:35

******************************************************
%SYSTEM-W-TZGMT, your local timezone has defaulted to GMT
%SYSTEM-I-SETTZ, to set your local timezone use:
     $ @SYSMANAGER:UCT$TIME_SETUP.COM

******************************************************
On MIN or UPGRADE system startup - CLUE is not run.
%%%%%%%%%%  OPCOM 13-NOV-1998 10:35:08.98   %%%%%%%%%%
Operator _OPA0: has been enabled, username SYSTEM
%%%%%%%%%%  OPCOM 13-NOV-1998 10:35:09.00   %%%%%%%%%%
Operator status for operator _OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12
%%%%%%%%%%  OPCOM 13-NOV-1998 10:35:09.62  %%%%%%%%%%
Logfile has been initialized by operator _OPA0:
Logfile is SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;1
%%%%%%%%%%  OPCOM 13-NOV-1998 10:35:09.64   %%%%%%%%%%
Operator status for operator SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;1
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12
%SYSTEM-I-BOOTUPGRADE, security auditing disabled
%%%%%%%%%%  OPCOM  13-NOV-1998 10:35:11.60  %%%%%%%%%%
Message from user JOB_CONTROL
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT
%%%%%%%%%%  OPCOM  13-NOV-1998 10:35:11.60  %%%%%%%%%%
Message from user JOB_CONTROL
-RMS-E-FNF, file not found
%LICENSE-F-EMTLDB, license database contains no license records
%SYSTEM-I-BOOTUPGRADE, security server not started
%%%%%%%%%%  OPCOM 13-NOV-1998 10:35:16:75   %%%%%%%%%%
Message from user SYSTEM
%LICENSE-E-NOAUTH, DEC VAX-VMS use is not authorized on this node
-LICENSE-F-NOLICENSE, no license is active for this software product
-LICENSE-I=SYSMGR, please see your system manager

%LICENSE-E-NOAUTH, DEC VAX-VMS use is not authorized on this node
-%LICENSE-F-NOLICENSE, no license is active for this software product
-%LICENSE-I-SYSMGR, please see your system manager
Startup processing continuing...
```

```
%SET-I-INTSET, login interactive limit = 1, current interactive value = 0
%SET-I-INTSET, login interactive limit = 0, current interactive value = 0
```

Note

You can ignore the time zone message. The UTC$TIME_SETUP.COM procedure runs during the final phase of the installation procedure.

The procedure also displays OPCOM messages from JOB_CONTROL stating the master queue file QMAN$MASTER.DAT does not exist. You can ignore these messages. You will create the queue file later.

You can also ignore error messages stating that the OpenVMS VAX license is not registered. License registration occurs later in the procedure. For more information about registering your licenses, see Appendix B and refer to the *OpenVMS License Management Utility Manual*.

3.2.5 Specifying the Volume Label

The procedure prompts you to specify the volume label of the system disk. A volume label is the name the OpenVMS VAX operating system uses to refer to the system disk. You can press Return to accept the default volume label, OVMSVAXSYS, or you can enter a volume label of your choice. The volume label can be 1 to 12 characters long; do not use spaces. For example:

```
    If this system disk is to be used in a cluster with multiple system
    disks, then each system disk must have a unique volume label.  Any
    nodes having system disks with duplicate volume labels will fail to
    boot into the cluster.

    You can indicate a volume label of 1 to 12 characters in length.  If you
    want to use the default name of OVMSVAXSYS, press RETURN in response
    to the next question.

* Enter the volume label for this system disk [OVMSVAXSYS]:
```

3.2.6 Specifying the Source Drive

The procedure prompts you to specify which drive holds the distribution kit. Enter the device name for the source drive.

For example, if you are not using the InfoServer and the source drive is a magnetic tape drive with the device name MUA0, type MUA0 and press Return.

```
* Enter name of drive holding the OpenVMS distribution media: MUA0
* Is the OpenVMS media ready to be mounted? [N] yes
%MOUNT-I-MOUNTED, VMS072 mounted on _MUA0:
```

If you are not using the InfoServer, continue to Section 3.2.7.

If you are using an InfoServer, enter DAD1:.

```
* Enter the volume label for this system disk [OpenVMS072]: SYSDSK1
* Enter name of drive holding the OpenVMS distribution media: DAD1:
```

The procedure then prompts you to:

```
* Enter the InfoServer service name [VAXVMS072]:
* Enter the InfoServer work group number [0]:
```

Press Return as a response to both of these prompts.

The InfoServer work group number was determined when you made a selection from the menu displayed by the InfoServer ISL program (see Section 3.1). If the answer to the group number is incorrect, the procedure displays the following:

```
InfoServer work group number must be in the range 0-1023.
```

The procedure then prompts you:

```
* Is the OpenVMS media ready to be mounted? [N]: Y
 %MOUNT-I-MOUNTED, VMS072 mounted on _DAD1:
```

3.2.7 Selecting Optional OpenVMS Components

The procedure displays information about OpenVMS VAX files that are optional and about the remaining amount of disk space. The information is similar to the following (block sizes might vary slightly):

```
     Select optional software you want to install. You can install one
     or more of the following OpenVMS or DECwindows components:

     o OpenVMS library                              -  52200 blocks
     o OpenVMS optional                             -  19000 blocks
     o OpenVMS Help Message                         -  10400 blocks
     o OpenVMS Management Station                   -  20000 blocks
     o DECwindows base support                      -   4400 blocks
     o DECwindows workstation support               -  23800 blocks
           -  75 dots per inch video fonts          -   (included)
           - 100 dots per inch video fonts          -   6200 blocks
     o DECnet-Plus networking                       -  80000 blocks
     o DECnet Phase IV networking                   -    800 blocks

Space remaining on system disk: 1170752 blocks
```

You must indicate which of the options you want to install. If you require network support, you must select the OpenVMS library component.

Note that, if you do not install the optional components at this time, you can install them after the installation by using the VMSTAILOR or DECW$TAILOR utility. However, the Help Message utility can be tailored on to the system disk only.

If you want to install Help Message on an alternate disk, you must install it now or install it *after* the installation procedure completes by entering the following BACKUP command:

```
BACKUP/VERIFY source-device:[000000]VMS072.E/SAVE_SET -
target-device:[directory-name]
```

For *source-device*, enter the device name for the drive on which the distribution media is mounted. For *target-device*, enter the device name on which the alternate disk is mounted, and for *directory-name*, enter the name of the directory to which you are copying the files.

Also note that, for TK50 CompacTape cartridges, it is quicker to install OpenVMS VAX software during the installation than to add software after the installation with a tailoring utility. For information about using VMSTAILOR, see Chapter 10.

To select the options you want to install, follow the instructions displayed by the procedure.

3.2.7.1 OpenVMS Library Files

The procedure displays the following message:

```
* Do you want to install the OpenVMS library files? (Y/N)
```

The file subclasses of the VMS072.C save set are listed in Appendix D. If you want to install the VMS072.C files, type Y (for Yes) and press Return. If you require network support, you must select the OpenVMS library component. If you do *not* want to install the VMS072.C files, type N (for No) and press Return.

3.2.7.2 OpenVMS Optional Files

The procedure displays the following message:

```
* Do you want to install the OpenVMS optional files? (Y/N)
```

The file subclasses of the VMS072.D save set are listed in Appendix D. If you want to install the VMS072.D files, type Y and press Return. If you do *not* want to install the VMS072.D files, type N and press Return.

3.2.7.3 Help Message Files

The procedure displays the following message:

```
    The Help Message utility (MSGHLP) provides online explanations
    and user actions for OpenVMS messages in place of the hardcopy
    DIGITAL OpenVMS System Messages and Recovery Procedures Reference Manual,
    which is now separately orderable.

    The MSGHLP database file, MSGHLP$LIBRARY.MSGHLP$DATA,
    consumes approximately 10400 blocks and will be
    placed by default on your system disk in SYS$COMMON:[SYSHLP]
    unless you specify an alternate device when prompted.

* Do you want to install the MSGHLP database? (Y/N)
```

The Help Message utility is an online system for system messages documentation. You can install Help Message either on the system disk or on an alternate disk. If you want to install the Help Message files, type Y and press Return.

The procedure displays the following message:

```
You can install this database on your system disk in SYS$COMMON:[SYSHLP]
or on an alternate device. If you specify an alternate device, but no
directory, MSGHLP$LIBRARY.MSGHLP$DATA is placed in [HELP_MESSAGE]. When
prompted, take the default of the system disk or specify an alternate
device, using this format:

                                device:[directory]

* Where do you want to install the MSGHLP database?[SYS$COMMON:[SYSHLP]] DUA1
```

The Help Message database is installed in the area you specify, and the system displays information similar to the following:

```
    Space remaining on alternate device DUA1: 124532 blocks
```

3.2.7.4 OpenVMS Management Station Files

The procedure displays the following message:

```
   The OpenVMS Management Station is a client-server application
   that provides OpenVMS system management capabilities through a
   client application on a personal computer (PC) running Microsoft
   Windows. The server application runs on OpenVMS systems and is
   automatically installed as part of the OpenVMS operating system.
```

```
   This option provides the files used to create the installation
   media for the PC client software.  If you want to use the OpenVMS
   Management Station, you must install these optional files on at
   least one OpenVMS system to create the installation media, which
   can then be used to install the PC client on one or more PCs.

   The OpenVMS Management Station client can run on Windows 3.1
   (including Windows for Workgroups), Windows NT, or Windows 95.

   The OpenVMS Management Station optional files consume approximately 20000
   blocks and will be placed on your system disk in SYS$COMMON:[TNT.CLIENT].

* Do you want to install the optional OpenVMS Management Station files? (Y/N)
```

If you want to use the OpenVMS Management Station software, you must install these files. After the installation procedure completes, follow the instructions in Appendix G to prepare your OpenVMS system and your PC to run the OpenVMS Management Station server and client software.

3.2.8 Choosing DECwindows Support Options

Next, the procedure displays messages about the DECwindows components shipped with OpenVMS VAX Version 7.2.

Note

The OpenVMS VAX operating system no longer ships the VMS DECwindows product. The operating system now ships only the DECwindows base support and DECwindows workstation support components. To get full DECwindows support, you must also install the separate DECwindows Motif for OpenVMS (previously called VMS DECwindows Motif) layered product, which supports both Motif and XUI environments.

The DECwindows base support and DECwindows workstation support components are *not* shipped with the layered product. If you want to install these options, you must select them now or use the DECW$TAILOR option after the installation procedure completes.

Before you indicate whether you want to install DECwindows support software, consider the following:

If you...	Then choose...
Intend to install the DECwindows Motif layered product	DECwindows base support.
Intend to install the DECwindows Motif layered product on a workstation or on a VAXcluster system that contains workstations	DECwindows base support and DECwindows workstation support.
Are *not* planning to install the DECwindows Motif layered product but are installing OpenVMS VAX on a workstation or on a VAXcluster that includes workstations	DECwindows base support and DECwindows workstation support.
Want to provide font files for X terminals	DECwindows base support and DECwindows workstation support.

If you...	Then choose...
Have a workstation monitor (for example, a VR150, VR160, or VR295) capable of displaying 100 dots/inch or a VAXstation 4000 series computer, which uses 100 dots /inch video fonts by default	DECwindows base support and DECwindows workstation support with the 100 dots/inch option. By selecting the workstation support files, you automatically get 75 dots/inch video font files, and you will be prompted to indicate if you want to install 100 dots/inch video font files.

The procedure displays the following:

```
     You can select DECwindows support now, or you can use the DECW$TAILOR utility
     to provide or remove DECwindows support after the installation.

     Some media, TK50s in particular, can be very slow when tailoring on files.
     You might want to select DECwindows now and tailor off unwanted files later.

     NOTE: This kit does NOT contain full DECwindows.
           To obtain full DECwindows, you must also install the separate
           layered product, DECwindows Motif for OpenVMS VAX.
           Version 1.2-3 is the minimum version of DECwindows Motif for OpenVMS VAX
           that can be used with OpenVMS VAX V7.2.

     The DECwindows components provided in this kit require approximately
     34400 blocks, broken down as follows:

         o DECwindows base support                    -   4400 blocks
         o DECwindows workstation support             -  23800 blocks
           -  75 dots per inch video fonts                (included)
           - 100 dots per inch video fonts (optional) -   6200 blocks

     You must select the DECwindows base support option if
         - you plan to run DECwindows software, or
         - you are installing this kit on
             * a workstation or
             * a VAXcluster that contains workstations, or
         - you want to provide font files for Xterminals.

     If you are installing this kit on a system that includes Xterminals
     and you do NOT select DECwindows base support, then you will have to use
     the DECW$TAILOR utility to provide font files.

* Do you want the DECwindows base support? (Y/N) y

     Space remaining: 1908594 blocks

     You must select the DECwindows workstation support option if
         - you are installing this kit on
             * a workstation or
             * a VAXcluster that contains workstations, or
         - you want to provide font files for Xterminals.

     If you are installing this kit on a system that includes Xterminals
     and you do NOT select DECwindows base support, then you will have to use
     the DECW$TAILOR utility to provide font files.

* Do you want to install DECwindows workstation support? (Y/N) y

     Space remaining:  1884794 blocks

     DECwindows workstation support includes the 75 dots per inch video fonts.

     All DECwindows applications run with 75 dots per inch video fonts.
     By default, most systems start up with 75 dots per inch video fonts.
     Certain applications can take advantage of 100 dots per inch video fonts.

     For the VAXstation 4000 series machine, 100 dots per inch video fonts
     are used by default.  If you decide not to install 100 dots per inch
     video fonts, you must edit SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.COM
     to force 75 dots per inch video fonts to be the default.  Otherwise,
     certain applications may not space text properly.
```

```
    For instructions on how to configure your system with both 75 and 100
    dots per inch video fonts, see the installation guide or look at the
    template command procedure SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.TEMPLATE.

*Do you want 100 dots per inch video fonts installed? (Y/N) n
```

3.2.9 Installing Networking Products

Next, the procedure displays messages describing the DECnet options. The OpenVMS VAX Version 7.2 installation procedure allows you to install either DECnet-Plus or DECnet Phase IV networking software. However, you cannot have both DECnet products installed concurrently on your system. Install either DECnet-Plus or DECnet Phase IV.

```
    Beginning with OpenVMS V7.1, the DECnet-Plus kit is provided with
    the OpenVMS operating system kit.  DIGITAL strongly recommends that
    DECnet users install DECnet-Plus.  DECnet Phase IV applications are
    supported by DECnet-Plus.

    DECnet Phase IV is also provided as an option.  Support for DECnet
    Phase IV is available through a Prior Version Support Contract
    available through Digital's MCS Services.

    If you install DECnet-Plus and TCP/IP you can run DECnet
    applications over a TCP/IP network.  Please see the OpenVMS
    Management Guide for information on running DECnet over TCP/IP.

    If you plan to install DECnet Phase IV, do NOT select DECnet-Plus.

* Do you want to install DECnet-Plus. (Y/N) n

* Do you want to install DECnet Phase IV? (Y/N) y

    Space remaining on system disk:  1883994 blocks
```

Note

If you select DECnet-Plus, you will not be prompted for DECnet Phase IV.

Once you have DECnet-Plus and TCP/IP installed on your system, you can run DECnet applications over your TCP/IP network. Refer to the *DECnet-Plus for OpenVMS Management Guide* for more information about DECnet over TCP/IP.

3.2.10 Verifying Your Choices

The procedure displays a list of OpenVMS VAX and DECwindows support options you have selected and gives you the opportunity to change your mind before proceeding by displaying the following message:

```
* Is this correct? (Y/N)
```

If you answer No to this prompt, you can respecify the OpenVMS and DECwindows support options you want to install.

3.2.11 Installing OpenVMS Options

If you answer Yes to the prompt in Section 3.2.9, the installation procedure begins restoring the OpenVMS options you have selected. After the installation has completed, you can use the VMSTAILOR utility to remove any optional OpenVMS files that you do not need. (For more information about using VMSTAILOR, see Chapter 10.)

This step in the procedure varies, depending on whether your distribution kit is on compact disc, tape cartridges, or magnetic tapes.

3.2.11.1 Compact Disc

If your distribution kit is on compact disc, leave the disc in the drive. The procedure displays messages as it restores each of the OpenVMS options you have chosen to install.

3.2.11.2 Magnetic Tape and Tape Cartridge

If your distribution kit is contained on open reel magnetic tapes or TK50 CompacTape cartridges, you may be asked to mount the second volume of the kit. If you need to mount the second volume, your system will display a message similar to the following:

```
Please mount volume 2 of the OpenVMS kit on <device>
```

where: *<device>* is the magnetic tape or tape cartridge drive.

The system displays one of the following messages:

- For a 9-track open reel magnetic tape, the message is similar to the following:

```
* Is the volume labeled OVMS VAX V7.2 BIN MT9 2/2 ready to be mounted?
```

- For a TK50 CompacTape cartridge, the message is similar to the following:

```
* Is the volume labeled OVMS VAX V7.2 BIN TK50 2/2 ready to be mounted?
```

To respond to either message, do the following:

1. Unload the volume currently in the drive.
2. Examine the remaining volumes and select the one with the label that matches the label specified in the prompt.
3. Load the volume and make the drive ready.
4. Answer YES to the question.

For information on which save sets are located on which tape volumes, refer to Section 1.3.2.

3.2.12 Installing DECwindows Support Software

If you are installing DECwindows software, the procedure installs the DECwindows options that you specified and displays messages similar to the following:

```
    Restoring DECwindows base support save set ...
%BACKUP-I-STARTVERIFY, starting verification pass

    Restoring DECwindows workstation support save set ...
%BACKUP-I-STARTVERIFY, starting verification pass

    Restoring DECwindows 75 dots per inch fonts save set ...
%BACKUP-I-STARTVERIFY, starting verification pass
```

The DECwindows support files are listed in Appendix E. After you finish the installation, you can use the DECwindows tailoring utility, DECW$TAILOR, to remove the DECwindows files you do not need. For more information about removing files with DECW$TAILOR, see Chapter 10.

3.3 Installing DECnet Phase IV Software

If you chose to install DECnet Phase IV earlier in the installation procedure, it will now be installed.

The procedure displays messages similar to the following and prompts you for information it needs to install DECnet Phase IV:

```
     Installing DECnet Phase IV...
%MOUNT-I-MOUNTED, VMS072 mounted on _MKB500:


The following product has been selected:
     DEC VAXVMS DECNET_PHASE_IV V7.2            Layered Product


Configuration phase starting ...

You will be asked to choose options, if any, for each selected product and for
any products that may be installed to satisfy software dependency requirements.

DEC VAXVMS DECNET_PHASE_IV V7.2: DECNET_PHASE_IV

     COPYRIGHT (c)  4-JAN-1999 -- All rights reserved

     Digital Equipment Corporation

* This product does not have any configuration options.

     Support addendum to DECnet Phase IV service contract required

     Do you want to continue? [YES]

Execution phase starting ...

The following product will be installed:
     DEC VAXVMS DECNET_PHASE_IV V7.2         Layered Product

Portion done: 0%...10%...20%...30%...40%...80%...90%...100?

The following product has been installed:
     DEC VAXVMS DECNET_PHASE_IV V7.2         Layered Product
```

If your distribution media is magnetic tape or tape cartridges, the procedure displays a message similar to the following after the options you have selected have been successfully installed:

```
You can now remove the distribution kit from MKB500:.
```

Remove the distribution media from the drive.

If your distribution media is compact disc, leave it in the drive.

3.4 Configuring a Cluster

The installation procedure now displays information about cluster configuration. But, because there is no network present on the system at this point in the procedure, no cluster configuration work can actually be performed at this time.

```
In a cluster, you can run multiple systems sharing all files except
PAGEFILE.SYS, SWAPFILE.SYS, SYSDUMP.DMP, and VAXVMSSYS.PAR.

Cluster configuration cannot be done at this time because no network
is present. In order to configure a cluster, you must FIRST do one
or both of the following:

    o Install DECnet-Plus (or DECnet Phase IV), or
    o Execute SYS$STARTUP:LAN$STARTUP.COM by removing the
      comment delimiter ("!") from the line

            $! @ SYS$STARTUP:LAN$STARTUP.COM

      in SYS$MANAGER:SYSTARTUP_VMS.COM.

Then configure the cluster by executing the following command:

            @SYS$MANAGER:CLUSTER_CONFIG.COM
```

```
See the DIGITAL OpenVMS System Manager's Manual: Essentials for more information.
```

Once the network is running on your system, you can execute the SYS$MANAGER:CLUSTER_CONFIG.COM command procedure to configure your cluster. For more information about cluster configuration, refer to the *OpenVMS System Manager's Manual: Essentials*.

3.5 Selecting the Default Windowing System

The procedure now lets you specify a default windowing system. If you want to select DECwindows Motif as the default windowing system, answer yes to the following question:

```
* Do you want DECwindows Motif as the default windowing system? (Y/N)
```

3.6 Setting Passwords

Next, the installation procedure prompts you to set passwords for the SYSTEM, SYSTEST, and FIELD accounts and uses this information to create a rights database.

When setting the passwords, note the following:

- Passwords must be at least eight characters in length; they do not appear on the display.
- Press Return after you enter the password.
- After you enter the password, the procedure checks to make sure it meets the requirements for a valid password.
- Reenter the password for verification.

The following is a sample display:

```
     Now we will ask you for new passwords for the following accounts:

               SYSTEM, SYSTEST, FIELD

     Passwords must be a minimum of 8 characters in length. All passwords
     will be checked and verified. Any passwords that can be guessed easily
     will not be accepted.

* Enter password for SYSTEM:
* Re-enter for verification:
%UAF-I-MDFYMSG, user record(s) updated
%VMS-I-PWD_OKAY, account password for SYSTEM verified

* Enter password for SYSTEST:
* Re-enter for verification:
%UAF-I-MDFYMSG, user record(s) updated
%VMS-I-PWD_OKAY, account password for SYSTEST verified

     The SYSTEST_CLIG account will be disabled. You must re-enable
     it before running UETP but do not assign a password.)

* Enter password for FIELD:
* Re-enter for verification:
%UAF-I-MDFYMSG, user record(s) updated
%VMS-I-PWD_OKAY, account password for FIELD verified
```

If there are no password errors, the procedure creates your rights database, and you can proceed to the next section.

If you reenter a password incorrectly or if the system determines that the password is too easy for another user to guess, the system displays an error messages similar to the following:

```
%VMS-I-PWD_INVALID, account password for SYSTEST is invalid
%VMS-I-PWD_WEAK, password is too easy to guess

Because of the preceding error, you must take action to secure this account.
You must either disable this account, change its password, or do both.
```

When the procedure asks if you want to disable the account, type N and press Return. When the procedure asks if you want to enter a new password, type Y and press Return. Then enter a new password. For example:

```
Do you want to disable this account (Y/N)? N
Do you want to change the account password (Y/N)? Y
You must now select a new primary password for the SYSTEST account. The
password you select must be at least 8 characters in length and cannot
be the same as the name of the account:

New password:
Verification:
%UAF-I-MDFYMSG, user record(s) updated
%VMS-I-PWD_SET, primary password for account SYSTEST set
```

When you have successfully set the passwords, the installation procedure creates your rights database, which lets you manage user access to the system, and displays the following message:

```
Creating RIGHTS database file, SYS$SYSTEM:RIGHTSLIST.DAT
Ignore any "-SYSTEM-F-DUPIDENT, duplicate identifier" errors
%UAF-I-RDBCREMSG, rights database create
.
.
.
```

3.7 Entering SCSNODE and SCSSYSTEMID Parameters

The procedure displays the following prompts:

```
* Please enter SCSNODE name:

* Please enter SCSSYSTEMID:
```

Enter the SCSNODE name and SCSSYSTEMID that you determined as part of the preinstallation tasks in Chapter 2.

3.8 Postinstallation Tasks Described

After the procedure creates the rights database, it displays messages describing postinstallation tasks you might want to perform.

Note

You do not perform these tasks now. Perform them *after* the installation completes.

The tasks displayed on your screen might vary from the following example, depending on what options you chose to install earlier in the procedure.

```
After the installation finishes, you might want to do one or more of the
following tasks:

o DECOMPRESS THE SYSTEM LIBRARIES - To save space, many of the system
  libraries are shipped in a data-compressed format.  If you have
  enough disk space, you can decompress the libraries for faster access.
  To data expand the libraries, type:

    $ @SYS$UPDATE:LIBDECOMP.COM
```

```
  If you do not decompress these libraries, you will experience
  slower response to the HELP and LINK commands.

o BUILD A STANDALONE BACKUP KIT - You can build a standalone BACKUP kit
  using the procedure described in the "Backup Procedures" chapter of
  the upgrade and installation supplement provided for your VAX computer.

o TAILOR THE SYSTEM DISK - You might want to review the files provided or
  not provided during this installation. If you find there are files
  you want to remove from the system disk (TAILOR OFF) or files you want
  to add (TAILOR ON), use the following utilities to perform the
  desired tailoring.

    OpenVMS tailoring:            $ RUN SYS$UPDATE:VMSTAILOR

    DECwindows tailoring:         $ RUN SYS$UPDATE:DECW$TAILOR

  Note: The tailor procedure cannot be used to TAILOR ON or to TAILOR OFF
        files located on an alternate disk.
```

For more information about decompressing the system libraries, see Section 4.7 in Chapter 4. For information on using VMSTAILOR or DECW$TAILOR, see Chapter 10.

After the messages about postinstallation tasks are displayed, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V7.2 Installation Procedure.


Configuring all devices on the system...
```

Proceed to the next section for information about registering your licenses.

3.9 Registering Licenses

Before you can use the OpenVMS VAX operating system and its components, you must register all licenses in the following order. If you do not register your licenses at this point in the procedure, you must register them immediately after the installation, *before* you perform postinstallation tasks.

1. Register the OpenVMS VAX license for the VAX computer on which you have just installed the operating system. If you have a VAXcluster environment, you then register an OpenVMS VAX license for each additional VAX computer in the cluster that will boot off the system disk that you just created. Each registered OpenVMS VAX license must be assigned to one of the nodes for the cluster.
2. Register the licenses for any System Integrated Products (SIPs) that you purchased.

For more information about registering licenses, refer to the following:

- *OpenVMS License Management Utility Manual*, which provides:
  - Details about all LICENSE commands, error messages, and recovery procedures for licensing tasks
  - A description of VMSLICENSE.COM, with step-by-step instructions for registering licenses
  - Examples of license registration using VMSLICENSE.COM and LICENSE REGISTER commands
- Appendix B of this manual for notes and supplemental information concerning licenses

You can use the SYS$UPDATE:VMSLICENSE.COM procedure to register a license for any DIGITAL product that supplies a Product Authorization Key (PAK). Or, you can register licenses with the LICENSE REGISTER command. Refer to the *OpenVMS License Management Utility Manual* for detailed information.

3.9.1 Types of OpenVMS VAX Licenses

The OpenVMS VAX operating system uses one of two different categories of licenses, depending on the hardware and software configuration used and currently supported. The two categories of operating system licenses for OpenVMS VAX are:

- VAX VMS licensing
- OpenVMS VAX licensing

The following table describes the types of licenses for each licensing category. DIGITAL provides the proper license type with the purchase of the system. Not all license types are available for every system model.

Type of License	Description
	VAX VMS Licenses
Traditional License	Provides unlimited use to the users on a defined system. VAX VMS traditional licenses are sized to capacity according to system type.
Multi-User License	Provides use according to a specified number of concurrent users. This is an activity-based license. The Multi-User License gives you the right to use the operating system for up to the limit of users specified in the license. An operating system *user* is one who is logged in to the system or one who is using the operating system software by means other than login, or both. This license is available only on limited system models, primarily MicroVAX and VAX 4000 systems. Interactive use of VAX systems licensed with the Multi-User License can be increased by the addition of the OpenVMS VAX Individual User License[1] for one or more users. For more information, refer to the description of the OpenVMS VAX Individual User License later in this table.
VAX VMS Workstation License	Provides use for a single user on a VAX workstation. This license type allows one direct login for the single user and then one additional login for system management purposes only. Additional interactive use of VAX workstations licensed with the VAX VMS Workstation License requires the addition of an OpenVMS VAX User License[1] for one or more users. For more information, refer to the description of the OpenVMS VAX Individual User License later in this table.

[1]The OpenVMS VAX Individual User License is not supported by the VMS or OpenVMS VAX operating system releases prior to VMS Version 5.5.

Type of License	Description
	VAX VMS Licenses
File and Application Server License	Provides for the noninteractive use of OpenVMS VAX. OpenVMS based VAXservers are sold with a File and Application Server License. The intent of an OpenVMS based VAXserver is to provide file, print, application, and compute *services* to *clients* who have remotely submitted their requests for these services. This license type also allows one direct login for system management purposes only. Additional interactive use of OpenVMS VAXservers licensed with the File and Application Server License requires the addition of an OpenVMS VAX User License[1] for one or more users. For more information, refer to the description of the OpenVMS VAX Individual User License later in this table.
	OpenVMS VAX Licenses
OpenVMS VAX O/S Base License[2]	Provides the right to unrestricted, noninteractive use of the OpenVMS VAX operating system for the execution of remotely submitted requests for batch, print, application, and computing services, on a designated, single processor. No direct OpenVMS VAX operating system logins by users are permitted on the system. One direct login is allowed for system management purposes only. Interactive use of systems licensed with an OpenVMS VAX O/S Base License requires the addition of an OpenVMS VAX Individual User License[1] for one or more users.
OpenVMS VAX Individual User License[1]	Provides the right to interactively use the operating system by a specified, or unlimited, number of concurrent users on a designated, single processor. A user is one who is logged in to a processor or one who is interactively using the operating system software by means other than login, or both. An OpenVMS VAX O/S Base License, or any of the four types of VAX VMS Licenses, is a prerequisite for the OpenVMS VAX Individual User License.

[1]The OpenVMS VAX Individual User License is not supported by the VMS or OpenVMS VAX operating system releases prior to VMS Version 5.5.

[2]The OpenVMS VAX O/S Base License is not supported by the VMS or OpenVMS VAX operating system releases prior to VMS Version 5.5.

3.9.2 How to Register OpenVMS VAX Licenses

After you install the OpenVMS VAX operating system, the system displays the following message:

```
   If you have any Product Authorization Keys (PAKS) to register, you can
   register them now.

* Do you want to register any Product Authorization Keys? (Y/N)
```

Respond to the prompt as follows:

If you choose ...	Then ...
Not to register the licenses at this time	Do the following: 1. Type N and press Return. 2. Go to Section 3.12. 3. Remember that, after the installation, you must register your licenses *before* performing any other postinstallation tasks (see Chapter 4).
To register your licenses now	Do the following: 1. Type Y and press Return. 2. Be sure you have a copy of your PAK for each license you will register. 3. Go to the next section to begin the licensing procedure.

3.9.3 Using the Licensing Procedure

Entering Y (Yes) to register your licenses during the installation invokes the SYS$UPDATE:VMSLICENSE.COM procedure, which displays the following message:

```
    OpenVMS License Management Utility Options:

        1. REGISTER a Product Authorization Key
        2. AMEND an existing Product Authorization Key
        3. CANCEL an existing Product Authorization Key
        4. LIST Product Authorization Keys
        5. MODIFY an existing Product Authorization Key
        6. DISABLE an existing Product Authorization Key
        7. DELETE an existing Product Authorization Key
        8. COPY an existing Product Authorization Key
        9. MOVE an existing Product Authorization Key
       10. ENABLE an existing Product Authorization Key
       11. SHOW the licenses loaded on this node
       12. SHOW the unit requirements for this node

       99. Exit this procedure

    Type '?' at any prompt for a description of the information
    requested. Press Ctrl/Z at any prompt to return to this menu.

Enter one of the above choices [1]
```

1. Select the appropriate options (beginning with 1, as indicated in the display) until you have successfully registered all required PAKs.
2. After you register all your licenses, exit from the License Management procedure by entering option 99.

3.9.4 How to Register System Integrated Products

After you register the OpenVMS VAX license, you must register the license for any of the following System Integrated Products (SIPs) you have purchased:

- VAXcluster
  (LMF Product Name: VAXCLUSTER)
- RMS Journaling for OpenVMS
  (LMF Product Name: RMSJNL)

  On systems that do not have registered and loaded journaling licenses, users cannot write to any files marked for journaling.

- Volume Shadowing for OpenVMS
  (LMF Product Name: VOLSHAD)

  You must register and load a license for Volume Shadowing for OpenVMS on each node using volume shadowing, including satellites in a VAXcluster system.

3.9.5 How to Register DECnet Products

You must also register the license for any of the DECnet products you have purchased. There are two DECnet licenses that apply to both DECnet-Plus and DECnet Phase IV:

- The end node license named DVNETEND
- The routing node license named DVNETRTG

  All routing nodes must have a routing license. Each end node can have either an end node license or a routing license. If neither license is registered and activated, DECnet does not start and your use is limited to local DECnet only (SET HOST 0). If DECnet for OpenVMS is running when you register your license, you must stop and then restart it.

  You can control which VAXcluster nodes have access to each license. Using the LICENSE MODIFY/INCLUDE=*(node-name[,node-name,...])* command, you can assign licenses to nodes and limit access as needed. For example, you can assign a routing node license to only one VAXcluster node and assign the end node licenses to the remaining VAXcluster nodes. If you choose this approach, make sure you assign a license to each end node license. Specify include lists for each license of the same type. For details, refer to the *OpenVMS License Management Utility Manual*.

3.10 Updating Time Zone Information

At this point in the installation, the procedure asks you for information that is used for providing local time zone support. For local time zone support to work correctly, the installation procedure must set the time zone that accurately describes the location you want to be considered as your default time zone. Usually, this is the time zone in which your system is running. In addition, your system must be correctly configured to use a valid OpenVMS time differential factor (TDF).

The procedure displays a series of time zone menus and prompts you to make selections from each. Begin by selecting the desired time zone from the main time zone menu. If you do not select a time zone, the default is Greenwich Mean Time (GMT).

If you choose a time zone that has subcomponents, the system displays an additional menu. For example, if you choose the United States (US) time zone from the main menu, a second menu displays the specific time zones within the United States. You then select the menu item that best represents the desired time zone.

The procedure then prompts you for the TDF. The TDF is the difference between your system time and Coordinated Universal Time (UTC), which is an international standard (similar to Greenwich Mean Time) for measuring time of day. The procedure supplies a default for TDF, which is generally the correct response.

You can choose from the following options:

- Exit the time zone procedure without setting a TDF
- Set a TDF
- Display the TDF for your local time zone

The following is a sample display:

```
%UTC-I-UPDTIME, updating Time Zone information in SYS$COMMON:[SYSEXE]

    Configuring the Local Time Zone

    TIME ZONE SPECIFICATION -- Main Time Zone Menu

      1) Australia       11) GMT            21) Mexico         31) Turkey
      2) Brazil          12) Greenwich      22) NZ             32) UCT
      3) CET             13) Hong Kong      23) NZ-CHAT        33) US
      4) Canada          14) Iceland        24) Navajo         34) UTC
      5) Chile           15) Iran           25) PRC            35) Universal
      6) Cuba            16) Israel         26) Poland         36) W-SU
      7) EET             17) Jamaica        27) ROC            37) WET
      8) Egypt           18) Japan          28) ROK            38) Zulu
      9) Factory         19) Libya          29) Singapore
     10) GB-Eire         20) MET            30) SystemV

      0) None of the above

Select the number above that best describes your location: 33

You selected US as your time zone.
Is this correct? (Yes/No) [YES]:

    US Time Zone Menu

       1) Alaska          4) Central         7) Hawaii          10) Mountain
       2) Aleutian        5) East-Indiana    8) Indiana-Starke  11) Pacific
       3) Arizona         6) Eastern         9) Michigan        12) Samoa

       0) None of the above

Select the number above that best describes your location: 6

You selected US/Eastern as your time zone.
Is this correct? (Yes/No) [YES]:

    Default Time Differential Factor for standard time is -5:00.
    Default Time Differential Factor for daylight saving time is -4:00.

    The Time Differential Factor (TDF) is the difference between your
    system time and Coordinated Universal Time (UTC).  UTC is similar
    in most repects to Greenwich Mean Time (GMT).

    The TDF is expressed as hours and minutes, and should be entered
    in the hh:mm format.  TDFs for the Americas will be negative
    (-3:00, -4:00, etc.); TDFs for Europe, Africa, Asia and Australia
    will be positive (1:00, 2:00, etc.).

Is Daylight Savings time in effect? (Yes/No): yes

Enter the Time Differential Factor [-4:00]:

    NEW SYSTEM TIME DIFFERENTIAL FACTOR = -4:00.

Is this correct? [Y]:
```

For more information about TDF and local time zone support, refer to the *OpenVMS System Manager's Manual*.

3.11 Installing DECnet-Plus Software

If you chose to install DECnet-Plus, the procedure will now install it. The procedure displays messages similar to the following and prompts you for information it needs to install DECnet-Plus.

```
DECnet-Plus will now be installed.

    Media containing the DECnet-Plus kit must be available.

    If you are installing OpenVMS from an InfoServer (DAD1)
    or local CD-ROM, there is a DECnet-Plus kit on the CD-ROM.

    If you are installing from a cartridge tape (TK50) or
    from an open reel tape, you should have a DECnet-Plus kit
    on cartridge tape or open reel tape.

    An appropriate DECnet-Plus kit may also be available on
    the Consolidated Distribution CD-ROM, or you may have a
    separate DECnet-Plus kit.

    NOTE: You may choose any available media for the
    DECnet-Plus kit.  It is NOT NECESSARY to use the same
    type of media that is contained in the OpenVMS kit.

    If you do not have a DECnet-Plus kit available, or if you
    have decided NOT to install/upgrade DECnet-Plus, you can
    bypass the DECnet-Plus installation by entering "EXIT"
    for the "name of drive holding the DECnet-Plus kit".

* Enter name of drive holding the DECnet-Plus kit: dkb200
* Is DKB200: ready to be mounted? [N] y

The following product has been selected:
    DEC VAXVMS DECNET_OSI V7.2              Layered Product


Configuration phase starting ...

You will be asked to choose options, if any, for each selected product and for
any products that may be installed to satisfy software dependency requirements.

 DEC VAXVMS DECNET_OSI V7.2: DECnet-Plus V7.2 for OpenVMS VAX

    Copyright © Digital Equipment Corporation 1999. All rights reserved.

    Digital Equipment Corporation

    This product requires one of two PAKs: DVNETEND or DVNETRTG.

Do you want the defaults for all options? [YES]

Do you want to review the options? [NO] yes

DEC VAXVMS DECNET_OSI V7.2: DECnet-Plus V7.2 for OpenVMS VAX
    DEC VAXVMS VMS V7.2 [Installed]
    VAX P.S.I. or P.S.I. Access software: NO
    VAX Wide Area Device Drivers: NO
    DECdns Server software: NO
    DECdts Server software: NO

Are you satisfied with these options? [YES]

Execution phase starting ...

The following product will be installed:
    DEC VAXVMS DECNET_OSI V7.2              Layered Product

Portion done: 0%...10%...20%...30%...40%...80%...90%...100%

The following product has been installed:
    DEC VAXVMS DECNET_OSI V7.2              Layered Product
```

To complete the installation procedure, continue to the next section, Section 3.12.

3.12 Running AUTOGEN

The remaining portion of the installation procedure runs AUTOGEN to evaluate your hardware configuration and estimate typical work loads. AUTOGEN then sets system parameters, the sizes of page, swap, and dump files, and the contents of VMSIMAGES.DAT. When AUTOGEN finishes and you reboot your system, the installation procedure is complete.

The installation procedure displays messages similar to the following:

```
   Running AUTOGEN to compute the new SYSTEM parameters ...

%AUTOGEN-I-BEGIN, GETDATA phase is beginning.
%AUTOGEN-I-NEWFILE, A new version of SYS$SYSTEM:PARAMS.DAT has been created.
        You may wish to purge this file.
%AUTOGEN-I-END, GETDATA phase has successfully completed.
     .
     .
     .

%AUTOGEN-I-BEGIN, REBOOT phase is beginning.
```

If you need to create or modify the size of the pagefile or swapfile, use the SYSMAN utility. For more information, refer to the *OpenVMS System Manager's Manual: Essentials*.

3.13 Rebooting the System

After AUTOGEN finishes, the system shuts down, displaying messages similar to the following:

```
The system is shutting down to allow the system to boot with the
generated site-specific parameters and installed images.

The system will automatically reboot after the shutdown and the
upgrade will be complete.

     SHUTDOWN -- Perform an Orderly System Shutdown
```

3.13.1 Rebooting the System Manually

If the system does not reboot automatically, reboot the system manually.

For example, if you have a VAX–11/780 computer and the system disk is on an RA60 disk drive with a unit number of 1, enter the following command and press Return:

```
>>> B DUA1
```

After the system reboots, a message similar to the following is displayed:

```
****************************************************************
OpenVMS VAX V7.2

You have SUCCESSFULLY installed the OpenVMS VAX Operating System.

The system is now executing the STARTUP procedure. Please
wait for the completion of STARTUP before logging in to the
system.

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

For more information about booting, refer to the upgrade and installation supplement for your VAX computer, then return to this manual.

Note

If you did not register your OpenVMS VAX license as described in Section 3.9, the procedure displays warning messages that the OpenVMS license must be registered. Be sure to register this license when the installation procedure finishes. For more information, see Appendix B and refer to the *OpenVMS License Management Utility Manual*.

The system next displays informational messages and accounting information indicating that your OpenVMS VAX operating system is running. For example:

```
%SET-I-INTSET, login interactive limit = 64, current interactive value = 0
  SYSTEM       job terminated at 13-NOV-1998 13:58:16.1
 Accounting information:
 Buffered I/O count:       859      Peak working set size:        565
 Direct I/O count:         478      Peak virtual size:           2570
 Page faults:             5003      Mounted volumes:                0
 Charged CPU time:  0 00:00:19.33   Elapsed time:       0 00:00:41.24
```

At this time, you can log in to the SYSTEM account (so you can perform postinstallation tasks), as described in the following sections.

3.14 Logging in to the SYSTEM Account by Means of a Character Cell Terminal

Log in to a character cell terminal by entering the user name SYSTEM followed by the password. The display is similar to the following:

```
     Welcome to OpenVMS VAX V7.2

Username: SYSTEM
Password:
     .
     .
     .
     Welcome to OpenVMS VAX Version V7.2
```

(If you forget your password, follow the instructions in the *OpenVMS System Manager's Manual: Essentials* to perform an emergency startup.)

3.15 Logging in to the SYSTEM Account by Means of a Workstation

If you installed the DECwindows Motif for OpenVMS VAX software on your workstation, do the following after the login window displays on your screen:

1. Enter the user name SYSTEM followed by the password.
2. Click on the OK button.

3.16 What to Do Next

After you have successfully installed the OpenVMS VAX operating system and logged in to the SYSTEM account, you must perform certain postinstallation tasks before you can use the system. For complete information, go to Chapter 4.

4

After Installing the OpenVMS VAX Operating System

After you have installed the OpenVMS VAX operating system, you need to perform several important tasks to prepare the system for operation. This chapter describes the following postinstallation tasks in the order you perform them:

- Verifying system time
- Registering licenses
- Backing up your system disk
- Customizing your system
- Configuring and starting networking software
- Testing the system
- Decompressing system libraries
- Removing unwanted files
- Installing layered products
- Backing up the customized system disk
- Running AUTOGEN
- Completing the postinstallation checklist

If you are an experienced system manager, you can use the checklist at the end of the chapter to complete the necessary postinstallation tasks.

If you are a system manager with less OpenVMS VAX experience, you should read the entire chapter and then use the checklist to make sure you have completed all the postinstallation tasks.

4.1 Verifying System Time

During the installation, the procedure prompted you to enter the date and time. Now that you have installed your system, verify that the system time is correct by entering the following command:

```
$ SHOW TIME
```

The system displays the date and time. If the time is not correct, reset it by entering the command SET TIME using the following format:

SET TIME=dd-mmm-yyyy:hh:mm:ss

For example:

```
$ SET TIME=13-NOV-1998:18:35:30
```

4.2 Registering Your Licenses

The installation procedure gave you the opportunity to register any software product licenses. If you did not register your OpenVMS VAX license at that time, you must do so before you can use the OpenVMS VAX operating system. You must register the licenses for any of the following System Integrated Products you have purchased:

VAXcluster
OpenVMS RMS Journaling
Volume Shadowing for OpenVMS

You must also register the licenses for any of the following DECnet products you have purchased:

DECnet-Plus
DECnet Phase IV

For step-by-step instructions about registering licenses, refer to the *OpenVMS License Management Utility Manual* and see Appendix B in this manual.

4.3 Backing Up Your System Disk

After you install the operating system, protect your work by making a backup copy of the system disk in case you have any problems during customization.

Compaq recommends that you perform the following operations:

- Make a standalone BACKUP kit on the system disk and on removable media.
- Perform a standalone BACKUP of your system disk.

In addition to backing up the system disk now before you customize it, you should back up your system disk again after you successfully complete your customization tasks.

For complete information about backup operations, refer to the upgrade and installation supplement for your VAX computer.

4.4 Customizing the System

You can customize the system to meet your site-specific needs. In addition, if your VAX computer is part of a VAXcluster environment, you must prepare the cluster environment and configure the cluster.

For instructions on customizing the system, read the following documentation:

- The chapter on booting in the upgrade and installation supplement for your VAX computer. This chapter explains the different ways to boot the system. It also tells you how to shut down the system.
- If the computer is part of a VAXcluster environment, the *OpenVMS Cluster Systems Manual* for further information about setting up a cluster.
- The release notes, for notes and restrictions that might be relevant to your customization plans.
- The *OpenVMS System Manager's Manual: Essentials* for instructions on customizing and using your system. It contains information about the following tasks:
  - Editing the template files SYCONFIG.COM, SYLOGICALS.COM, SYLOGIN.COM, and SYSTARTUP_VMS.COM

  - Starting the queue manager and creating a queue database. (If you are installing on a VAXcluster system with multiple system disks, refer to the *OpenVMS Cluster Systems* for additional instructions.)
  - Setting up user accounts
  - Adjusting system parameters

- If you plan to use either the DECnet-Plus product or the DECnet Phase IV product included on the OpenVMS VAX Version 7.2 kit, read Section 4.5 and perform the steps described there. If you are installing the DECnet-Plus software, also refer to the DECnet-Plus installation and configuration documentation.
- If you installed DECwindows support software, there are several steps you must take to customize your DECwindows environment. Depending on your configuration, these tasks might include:
  - Customizing the server startup
  - Using the Transmission Control Protocol/Internet Protocol (TCP/IP) as a DECwindows transport
  - Using transports for DECwindows other than those supplied by Compaq

  See Chapter 9 for complete instructions for customizing your DECwindows support software.
- If you installed the optional OpenVMS Management Station files, see Appendix G for information about preparing your OpenVMS system and your PC to use this application.

4.5 Configuring and Starting Networking Software

In local area and mixed-interconnect VAXcluster systems, DECnet software provides both system management functions and cluster communications, such as remote booting operations. DECnet software ensures that system managers can access all VAXcluster computers from a single terminal.

You can use the DECnet-Plus or DECnet Phase IV software included on the OpenVMS VAX Version 7.2 kit. Both of these products require that you run a configuration procedure to configure the network. If you choose to run the DECnet Phase IV product, you must also edit your system startup file as described in Section 4.5.2.

4.5.1 Configuring Your System

After you have registered your DECnet license, execute one of the following interactive configuration procedures:

- For the DECnet Phase IV software, run SYS$MANAGER:NETCONFIG.COM. (Refer to the *DECnet for OpenVMS Guide to Networking* for more information.)
- For the DECnet-Plus for OpenVMS layered product, run SYS$MANAGER:NET$CONFIGURE.COM. (Refer to the *DECnet-Plus for OpenVMS Installation and Basic Configuration* manual for more information.)

4.5.2 Editing SYSTARTUP_VMS

If you plan to run DECnet-Plus, you do not need to edit this file because DECnet will start automatically.

If you plan to run DECnet Phase IV, after you start the queue manager, edit the commands in SYS$COMMON:[SYSMGR]SYSTARTUP_VMS.COM that pertain to networking, so that DECnet starts automatically when you boot the system. Choose one of the following commands to start the network and remove the comment delimiter (!) from that command:

```
$! IF F$SEARCH("SYS$SYSTEM:NETACP.EXE") .NES. "" THEN @SYS$MANAGER:STARTNET
$! IF F$SEARCH("SYS$SYSTEM:NETACP.EXE") .NES. "" THEN SUBMIT SYS$MANAGER:STARTNET.COM
```

Both of the previous commands perform the same task. However, the first command executes STARTNET.COM and delays further processing until the procedure is completed; the second submits STARTNET.COM to a batch queue and continues executing SYSTARTUP_VMS.COM. If you plan to run both DECnet Phase IV and DECwindows Motif for OpenVMS VAX, you must also edit SYS$COMMON:[SYSMGR]SYSTARTUP_VMS.COM to add a comment delimiter (!) immediately following the dollar-sign ($) in the DEFINE DECW$IGNORE_DECNET command as follows:

```
$! DEFINE DECW$IGNORE_DECNET TRUE
```

If you are not going to start DECnet Phase IV or have not yet started it, this command tells DECwindows not to wait for DECnet.

4.6 Testing the System with UETP

The User Environment Test Package (UETP) is a software package designed to test whether the OpenVMS VAX operating system is installed correctly. As part of the postinstallation procedure, Compaq recommends that you run UETP to verify the installation.

Note that UETP needs at least 1200 free blocks on the system disk and is available only if you installed the optional save set VMS072.D. If you did not install the optional save set, you can add the UETP files to your system using VMSTAILOR.

For information about using VMSTAILOR, see Chapter 10.

For complete information about using UETP, refer to the *OpenVMS System Manager's Manual*.

4.7 Decompressing the System Libraries

Decompressing the system libraries gives the system faster access to them. You can decompress all the system libraries or just some of them. You use the LIBDECOMP.COM procedure to decompress the libraries.

4.7.1 Determining Disk Space

To find out how much disk space you have, enter the following command and press Return:

```
$ SHOW DEVICE SYS$SYSDEVICE
```

The additional amount of disk space required to decompress all the system libraries is about 13,500 blocks.

Table 4–1 gives the approximate number of blocks consumed by each library after decompression.

Table 4–1 Sizes of Decompressed System Libraries

Library	Blocks	Library	Blocks
HELPLIB.HLB	9108	EDFHLP.HLB	102
STARLET.OLB	8442	TPUHELP.HLB	1038
VAXCCURSE.OLB	102	ACLEDT.HLB	102
VAXCRTL.OLB	477	INSTALHLP.HLB	102
VAXCRTLG.OLB	102	LATCP$HELP.HLB	240
DECCCURSE.OLB	102	MNRHELP.HLB	102
DECCRTL.OLB	183	PATCHHELP.HLB	102
DECCRTLG.OLB	102	PHONEHELP.HLB	102
ERFLIB.TLB	105	SDA.HLB	111
STARLETSD.TLB	4800	SHWCLHELP.HLB	150
MAILHELP.HLB	273	SYSGEN.HLB	393
EDTHELP.HLB	231	TECO.HLB	102
DBG$UIHELP.HLB	408	UAFHELP.HLB	372
DBG$HELP.HLB	1986	EVE$HELP.HLB	1197
EXCHNGHLP.HLB	117	EVE$KEYHELP.HLB	147
NCPHELP.HLB	537	STARLET.MLB	2502
ANLRMSHLP.HLB	102	LIB.MLB	2229
DISKQUOTA.HLB	102		

4.7.2 Methods of Using LIBDECOMP.COM

You can use the LIBDECOMP.COM procedure to decompress libraries in three ways:

- Entering a command and responding to prompts from the procedure
- Entering an interactive command
- Entering a batch command

The following sections describe each method.

Note

Before you use the LIBDECOMP.COM procedure, be sure you are logged in to the SYSTEM account.

4.7.3 Responding to LIBDECOMP.COM Prompts

If you want to decompress libraries by responding to prompts from the LIBDECOMP.COM procedure, do the following:

1. Enter the following command and then press Return:

```
$ @SYS$UPDATE:LIBDECOMP.COM
```

The following information is displayed:

```
                OpenVMS Library Decompression Utility

 1  HELPLIB.HLB          14  NCPHELP.HLB          27  PHONEHELP.HLB
 2  STARLET.OLB          15  SDA.HLB              28  LIB.MLB
 3  ACLEDT.HLB           16  SHWCLHELP.HLB        29  STARLET.MLB
 4  ANLRMSHLP.HLB        17  SYSGEN.HLB           30  STARLETSD.TLB
 5  DBG$HELP.HLB         18  ANALAUDIT$HELP.HLB   31  SYS$STARLET_C.TLB
 6  DBG$UIHELP.HLB       19  SYSMANHELP.HLB       32  ERFLIB.TLB
 7  DISKQUOTA.HLB        20  TFF$TFUHELP.HLB      33  SYS$LIB_C.TLB
 8  EDFHLP.HLB           21  EXCHNGHLP.HLB        34  VAXCCURSE.OLB
 9  INSTALHLP.HLB        22  TPUHELP.HLB          35  VAXCRTL.OLB
10  LATCP$HELP.HLB       23  EVE$HELP.HLB         36  VAXCRTLD.OLB
11  MAILHELP.HLB         24  EVE$KEYHELP.HLB      37  VAXCRTLT.OLB
12  MNRHELP.HLB          25  UAFHELP.HLB          38  IMAGELIB.OLB
13  EDTHELP.HLB          26  TECO.HLB

     39  VMS$VOLATILE_PRIVATE_INTERFACES.OLB


      A  ALL libraries to be decompressed
      E  EXIT this procedure

* Enter letter or number(s) of libraries to be decompressed
  (Separate multiple entries with a comma):
```

2. Enter the appropriate letter or the numbers of the libraries you want to decompress. To decompress all libraries, the process takes approximately one-half hour.

4.7.4 Using LIBDECOMP.COM Interactively

You can execute LIBDECOMP.COM interactively to decompress up to eight libraries at a time by listing the names of the libraries you want to decompress as parameters on the command line. (You can decompress all the libraries by omitting the /PARAMETERS qualifier.)

Be sure you do not include the file extensions. For example, to decompress the VAXCRTL.OLB, DISKQUOTA.HLB, and LIB.MLB libraries interactively, enter the following command:

```
$ @SYS$UPDATE:LIBDECOMP VAXCRTL DISKQUOTA LIB
```

4.7.5 Using LIBDECOMP.COM in Batch

You can also execute LIBDECOMP.COM in batch mode to decompress up to eight libraries at a time by listing the names of the libraries you want to decompress as parameters on a command line that includes the SUBMIT command.

Be sure to separate the library names with commas and do not include the file extensions. For example, to decompress VAXCRTL.OLB, DISKQUOTA.HLB, and LIB.MLB as a batch job, enter the following command:

```
$ SUBMIT/NOTIFY/PARAMETERS=(VAXCRTL, DISKQUOTA, LIB)-
_$ SYS$UPDATE:LIBDECOMP
```

Note

When you enter the command for a batch job, be sure you enclose the list of library names within parentheses.

4.8 Adding and Removing Operating System Files

To remove OpenVMS VAX operating system files from the system disk, use VMSTAILOR or DECW$TAILOR. For example, if you are not running DECnet software, use VMSTAILOR to remove the files associated with DECnet.

Note

You cannot use VMSTAILOR to remove files installed on an alternate device from save set VMS072.E.

For complete information about using VMSTAILOR and DECW$TAILOR to remove optional OpenVMS VAX software, see Chapter 10.

4.9 Installing Layered Products

Back up your system disk and then use either the VMSINSTAL command procedure or the POLYCENTER Software Installation utility to install layered products on your system.

For additional information about installing layered products, refer to the *OpenVMS System Manager's Manual*.

4.10 Backing Up the Customized System Disk

After you have customized the OpenVMS VAX operating system to your satisfaction and installed your layered products, protect your work by making a standalone backup copy of the system disk.

For complete information about backup operations, refer to the upgrade and installation supplement for your VAX computer.

4.11 Running AUTOGEN

When you installed the OpenVMS VAX operating system, the system executed the AUTOGEN.COM procedure to set the values of system parameters and the sizes of the page and swap files according to the system's workload.

In many cases, AUTOGEN can improve system performance by using dynamic feedback information from the running system. As a postinstallation task, you should run the AUTOGEN.COM procedure again to properly tune the system.

Run AUTOGEN as follows:

1. After 24 hours of operation, run AUTOGEN in feedback mode and reboot the system.
2. Run AUTOGEN again in feedback mode two workdays later, and reboot the system.

Note

For large memory systems such as the VAX 9000 computer, AUTOGEN's initial parameter calculations are conservative. To obtain parameter values that match your system workload, you can run AUTOGEN in feedback mode a number of times. For more information, refer to the upgrade and installation supplement for your computer.

3. Compaq recommends that you run AUTOGEN from SAVPARAMS through TESTFILES on a weekly basis thereafter, and examine AGEN$PARAMS.REPORT to determine the need for additional changes.

After you run AUTOGEN following the first 24 hours of system operation (step 1), review the checklist in Section 4.12 to confirm that you have completed all the tasks described in this chapter.

4.11.1 Modifying Parameters

When AUTOGEN runs, it uses the parameter values in SYS$SYSTEM:MODPARAMS.DAT. Based on your examination of AGEN$PARAMS.REPORT, you might need to modify parameter values in MODPARAMS.DAT. If so, note that hardcoded values in MODPARAMS.DAT affect AUTOGEN's ability to calculate feedback parameters. For AUTOGEN to properly calculate minimum default values, you should replace the hardcoded values in MODPARAMS.DAT with MIN_ values. If you need to modify the parameter values calculated by AUTOGEN, you can use AUTOGEN to change the hardcoded values in MODPARAMS.DAT.

For more information about the MODPARAMS.DAT file and about using AUTOGEN in general, refer to the *OpenVMS System Manager's Manual*.

4.12 Postinstallation Checklist

Use the following checklist to make sure you perform all the necessary postinstallation tasks.

- ☐ Verify the system time. (Described in Section 4.1)
- ☐ Register your licenses if you did not do so during the installation procedure. (Described in Appendix B of this manual and in the *OpenVMS License Management Utility Manual*)
- ☐ Build a standalone BACKUP kit on the system disk and on removable media. (Described in the upgrade and installation supplement for your computer)
- ☐ Back up the system disk as a safeguard before customizing the system. (Described in the upgrade and installation supplement for your computer)
- ☐ Customize the system. (Described in Section 4.4)
- ☐ Configure and start your networking software. (Described in Section 4.5)
- ☐ Run the User Environment Test Package (UETP) to test the system. (Described in *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*)
- ☐ Decompress the system libraries using LIBDECOMP.COM. (Described in Section 4.7)
- ☐ Remove unwanted files from the system disk using the OpenVMS tailoring utility. (Described in Chapter 10)
- ☐ Install layered products.
- ☐ Back up the system disk after you have customized it. (Described in the upgrade and installation supplement for your computer)
- ☐ Run AUTOGEN after the system has been running for at least 24 hours to collect feedback information. (Described in Section 4.11.)

5

Before Upgrading the OpenVMS VAX Operating System

This chapter describes which tasks you should perform prior to beginning an upgrade. Tasks described in this chapter include:

- Reviewing cautions and restrictions
- Making sure your hardware is ready and your software distribution kit is complete
- Examining AUTOGEN feedback data
- Backing up your system disk
- Preparing your system disk
- Preparing your system
- Gathering the information for the upgrade procedure
- Completing the preupgrade checklist

If you are an experienced system manager, you can use the checklist at the end of this chapter to complete the necessary preupgrade tasks.

If you are system manager with limited OpenVMS VAX experience, you should read the entire chapter and then use the checklist to make sure you have completed all the preupgrade tasks.

5.1 Cautions and Restrictions

This section provides important information that can affect the success of your upgrade. If you attempt to upgrade your system without following these cautions and restrictions, the upgrade could fail or your upgraded system might not perform as expected.

5.1.1 License Requirements

To upgrade to OpenVMS VAX Version 7.2, you must have an appropriate license. Compaq's software licenses grant the right to use the current version of a product or any previous version of the product at the time of purchase. If you have an OpenVMS license prior to Version 7.2 and are not covered by a Software Product Services agreement, which includes the right to use new versions (RTNV), you must purchase an Update License before upgrading to OpenVMS VAX Version 7.2.

If you do not have an Update License, contact your Compaq account representative to assist you in obtaining the correct Product Authorization Key (PAK) needed to access the OpenVMS operating system.

5.1.2 DECset Version 11 Debugger

If you have the DECset Version 11 layered product installed on your system, you must remove the @DEBUG$STARTUP.COM command from the system startup procedure. The debugger shipped with OpenVMS VAX Version 7.2 is a superset of the debugger that was shipped with the DECset Version 11 software. Removing the @DEBUG$STARTUP.COM command will cause the debugger shipped with OpenVMS VAX Version 7.2 to be the default system debugger.

To remove the @DEBUG$STARTUP.COM command *before* you upgrade the operating system software, perform the following steps:

1. Log in to an account with system privileges.
2. Using the editor of your choice, open the SYS$STARTUP:SYSTARTUP_VMS.COM file and search for the following command:

   ```
   $ @DEBUG$STARTUP
   ```

   Delete the command and any parameters. (The command might have an optional parameter of either VMS or DECSET.)
3. Exit from the file, saving the change.

If you do not remove this command before you upgrade the operating system software, you must remove it after the upgrade, and you must deassign the logicals that were defined by DEBUG$STARTUP.COM by performing the following steps:

1. Log in to the account that you used to perform the upgrade.
2. Enter the following commands:

   ```
   $ DEASSIGN/SYSTEM DEBUG
   $ DEASSIGN/SYSTEM DEBUGSHR
   $ DEASSIGN/SYSTEM DEBUGUISHR
   $ DEASSIGN/SYSTEM DBGTBKMSG
   $ DEASSIGN/SYSTEM DBG$HELP
   $ DEASSIGN/SYSTEM DBG$UIHELP
   $ DEASSIGN/SYSTEM DEBUGAPPCLASS
   $ DEASSIGN/SYSTEM VMSDEBUGUIL
   ```
3. Using the editor of your choice, open the SYSTARTUP_VMS.COM file and search for the following command:

   ```
   $ @DEBUG$STARTUP
   ```

   Delete the command and any parameters. (The command might have an optional parameter of either VMS or DECSET.)
4. Exit from the file, saving the change.

5.1.3 Customized Security Environment

The OpenVMS VAX Version 7.2 upgrade procedure provides new files and directories in the directory [VMS$COMMON...]. If you had any special protections and access control lists (ACLs) before the upgrade, you need to reapply them to reestablish the security environment you had previously. For more information about creating and maintaining a secure environment, refer to the *OpenVMS Guide to System Security*.

5.1.4 Operator and Accounting Logs

The upgrade procedure deletes all the operator and accounting logs. To save these files, move them to a user directory before you start the upgrade.

5.1.5 Special Testing and Debugging Files

Before you perform an upgrade, remove or rename any special testing or debugging files that you might have in any of the SYS$SPECIFIC: or SYS$SYSROOT: directories. Files in these directories are used in place of the files in SYS$COMMON: directories.

As a minimum, you should check the following directories:

```
SYS$SYSROOT:[SYSEXE]
SYS$SYSROOT:[SYS$LDR]
```

Because the upgrade procedure affects the SYS$COMMON: directories and does not check or alter the contents of the SYS$SPECIFIC: or SYS$SYSROOT: directories, any testing or debugging files that you have in these directories remain there unchanged until you remove or rename them. If you do not remove or rename these files, your system might behave in an unpredictable manner.

5.1.6 Cluster Considerations

The following cautions apply when you are upgrading a cluster system:

- The upgrade procedure does *not* work across the network. The network is not available during the upgrade, so you must have the save sets available locally or on the InfoServer.
- If the node you are upgrading is a cluster member, the upgrade procedure checks the previously set values of several system parameters at the beginning of the upgrade (see Section 7.2.) If any of the values are less than that required to upgrade to OpenVMS VAX Version 7.2, you are given the choice of continuing or canceling the upgrade. If you choose to continue the upgrade, the entire upgrade might not be completed and the cluster might be left in a hung state.
- Before you start the upgrade procedure in a VAXcluster environment, you must shut down all the nodes that boot from the system disk you are upgrading, including the node you perform the upgrade on.

5.1.7 Save Set Location

If you move the OpenVMS VAX save sets from the distribution media to the system disk or some other disk before beginning the upgrade, the save sets must be in the [000000] directory of the disk, or the upgrade will fail.

Do not attempt to use VMSINSTAL with OPTION G to transfer OpenVMS VAX save sets to another media type; doing so produces an unusable system. Instead, you can use the DCL command COPY to transfer save sets to another media type.

5.1.8 System Disk Cautions

The following cautions apply to the system disk:

- If you changed the names of system directories on your system disk, the upgrade procedure will not work correctly. Restore your system disk to a standard directory structure before you attempt an upgrade.
- You must not move the system disk or the distribution kit from one drive to another during the upgrade.

- You cannot upgrade a shadowed system disk. If your system disk is part of a shadow set, you must create a nonshadowed system disk before beginning the upgrade.

  Also, if you copy the distribution media to another disk, that disk must be a nonshadowed disk.

  For more information, refer to the manual *Volume Shadowing for OpenVMS*.

- If you elect not to install optional components, the upgrade procedure removes existing files for those components from the system disk. You can install optional files during the upgrade or later using VMSTAILOR.

  Note that, while some optional files can be placed on an alternate device, you cannot tailor files on or off an alternate device.

5.1.9 AUTOGEN Feedback Data

If you use your AUTOGEN feedback data, you should save this information before rebooting the system with minimum startup to begin the upgrade. For more information, see Section 5.3.

5.1.10 OpenVMS VAX Version Requirements

Before you can upgrade to OpenVMS VAX Version 7.2, your system must be running at least Version 6.1 of the OpenVMS VAX operating system. For example, you can upgrade a system disk to Version 7.2 of the OpenVMS VAX operating system from any of the following versions (or related hardware releases):

OpenVMS VAX Version 6.1
OpenVMS VAX Version 6.2
OpenVMS VAX Version 7.0
OpenVMS VAX Version 7.1

5.1.11 DECwindows Motif Version Requirements

If you want to use DECwindows software with OpenVMS VAX Version 7.2, you must be running Version 1.2–3 or higher of the DECwindows Motif for OpenVMS layered product.

For more information, see Section 1.1.2.

5.1.12 Shared System Dump Files

If you have a shared system dump file in SYS$COMMON:[SYSEXE], the shared dump file cannot have the name SYSDUMP.DMP. If you have a shared system dump file with this name, Compaq recommends that you rename it to SYS$COMMON:[SYSEXE]SYSDUMP_COMMON.DMP.

5.1.13 Layered Products

The upgrade procedure is designed so that you should not have to reinstall most layered products after the upgrade. However, you might need to reinstall certain layered products because of product-specific installation procedures.

If a layered product is available yet exhibits unexpected behavior once Version 7.2 of the OpenVMS VAX operating system is running, check the *OpenVMS Version 7.2 Release Notes* for possible layered-product restrictions.

5.2 Preparing to Upgrade

Before you begin to upgrade the OpenVMS VAX operating system, be sure you have all the required hardware and software components.

5.2.1 Hardware Components

Examine your hardware for the following:

- Make sure your hardware has been checked for proper operation. To perform a successful upgrade, you must understand the basic operations of the VAX computer that you are upgrading. Refer to the upgrade and installation supplement for your VAX computer. If you have a VAXcluster environment, refer to *OpenVMS Cluster Systems*.
- Set up your system to record the upgrade procedure on either a hardcopy terminal or a printer attached to the console terminal. If you do not do this, the screen messages will be lost. You need a transcript in case there is a problem during the upgrade. For more information, refer to the upgrade and installation supplement for your VAX computer.
- Have scratch console media (media that does not contain files you want to save) available for the following VAX computers:

  VAX 8600, 8650
  VAX 8200, 8250, 8300, 8350
  VAX–11/730
  VAX–11/750
  VAX–11/780, 785

  For example, if you have a VAX–11/780 or VAX–11/785 computer, you need a scratch RX01 diskette.

5.2.2 Software Components

Examine your software for the following:

- Make sure you have all the items listed on the bill of materials (BOM) in the OpenVMS distribution kit. If your kit is incomplete, notify Compaq Software Supply, and request priority shipment of any missing items.
- Before upgrading the OpenVMS VAX operating system, read Appendix B of this manual, the *OpenVMS Version 7.2 New Features Manual*, the *OpenVMS Version 7.2 Release Notes*, and any cover letters included with your kit.

5.3 Examining AUTOGEN Feedback Data

After the upgrade is finished, AUTOGEN runs. If it finds valid feedback data on your system, it tries to use AUTOGEN feedback.

5.3.1 Valid Feedback Data

Feedback data is produced by the SAVPARAMS phase of AUTOGEN and is stored in SYS$SYSTEM:AGEN$FEEDBACK.DAT. Valid feedback data is defined as follows:

- The system was up for at least 24 hours when the feedback data was gathered.
- The feedback data is not over 30 days old.

If your feedback data is not valid, AUTOGEN will run without feedback (all previous feedback-generated parameters will be replaced by the AUTOGEN NOFEEDBACK calculations).

5.3.2 How to Test Feedback Data

To ensure that AUTOGEN feedback will run after the upgrade, do the following:

1. Check the validity of your current feedback data by entering the following command:

   ```
   $ @SYS$UPDATE:AUTOGEN GETDATA TESTFILES
   ```

   This command is for test purposes and does not result in the modification of system parameters or changes to the page and swap files. If your current feedback is valid, AUTOGEN uses it during the upgrade, and you can proceed to the next section.

   If your current feedback data is invalid, AUTOGEN issues several warnings. If you get these warnings, go to step 2.

2. If your current feedback is invalid, you can generate new feedback data (assuming your system was up for at least 24 hours). Enter the following command:

   ```
   $ @SYS$UPDATE:AUTOGEN SAVPARAMS TESTFILES
   ```

   This command is for test purposes and does not result in the modification of system parameters or changes to the page and swap files. Again, AUTOGEN warns you if the feedback data just produced is invalid.

3. If you follow steps 1 or 2 and your current feedback data is valid, AUTOGEN uses your current feedback-generated parameters during the upgrade. Your current feedback-generated parameters will not be lost during the upgrade.

5.4 Backing Up the System Disk

Compaq recommends that you make a standalone BACKUP copy of the system disk and, if your configuration allows it, upgrade the *backup copy*. If there are problems, you will still have a working system disk.

5.4.1 How to Back Up the System Disk

To make a backup copy of the system disk, follow the instructions in the upgrade and installation supplement for your VAX computer. If you do not have a removable system disk, back up your system disk to tape and restore the image backup to the system disk. This eliminates disk fragmentation on the system disk and creates contiguous free disk blocks required for the upgrade. (The upgrade can fail if there are not sufficient contiguous free blocks.) Store the backup tapes in a safe place.

5.4.2 How to Back Up Console Media

If you have one of the following VAX computers, you must also make a backup copy of the console media:

VAX–11/730
VAX–11/750
VAX–11/780, 785
VAX 8200, 8250, 8300, 8350, 8600, 8650

To make a backup copy of the console media, use the SYS$UPDATE:CONSCOPY.COM procedure, as described in the upgrade and installation supplement for your VAX computer. Use the backup copy of the console media during the upgrade procedure. The upgrade procedure automatically updates the console media for you.

If your VAX computer uses one of the following console media, you did not receive a new standalone BACKUP kit with your OpenVMS VAX distribution kit:

TU58 tape cartridge
RX33 diskette
RX50 diskette
RX01 diskette
RL02 disk cartridge

Before beginning the upgrade, make sure you have a standalone BACKUP kit on one of these media. If you do not have one, create a standalone BACKUP kit using the STABACKIT.COM procedure as described in the upgrade and installation supplement for your VAX computer.

Note

You cannot build standalone BACKUP on TU58 or RX01 console media because the OpenVMS VAX Version 7.2 kit is too large. If your VAX computer uses a TU58 or RX01, build a standalone BACKUP kit before upgrading and retain the backup copies for use with future versions of OpenVMS VAX.

5.5 Preparing the System Disk

To prepare the system disk for the upgrade, log in to the SYSTEM account and, depending on your configuration, complete some or all of the tasks described in the sections that follow.

5.5.1 Create a Nonshadowed System Disk

If you are using a volume-shadowed system disk, you must create a nonshadowed system disk to upgrade. Follow the instructions in the *Volume Shadowing for OpenVMS* manual to prepare a nonshadowed system disk for the upgrade.

5.5.2 Boot the Backup Copy of Your System Disk

If you need to boot the backup copy of your system disk or if you are upgrading a VAXcluster environment, enter the following command (otherwise, go to the next step):

```
$ @SYS$SYSTEM:SHUTDOWN
```

When the procedure asks if an automatic system reboot should be performed, press Return for NO. If you are a VAXcluster member, choose the REMOVE_ NODE option. When the procedure is finished, halt the system as described in the upgrade and installation supplement for your VAX computer.

If applicable, remove the system disk and replace it with the backup copy.

Boot the system from the backup copy of the system disk. If you do not know how to boot the system, refer to the upgrade and installation supplement for your VAX computer.

Log in to the SYSTEM account.

5.5.3 Copy UAF and Auditing Files to the System Disk

The current copies of the SYSUAF.DAT and the VMS$AUDIT_SERVER.DAT files must be on the system disk; otherwise, you cannot proceed with the upgrade.

If you have moved your copy of SYSUAF.DAT to another location, copy it to the SYS$COMMON:[SYSEXE] directory for the duration of the upgrade.

If you have moved your copy of VMS$AUDIT_SERVER.DAT to another location, copy it to the SYS$COMMON:[SYSMGR] directory.

Note that, if you are doing a rolling upgrade, the shared version of SYSUAF.DAT is not updated.

Move any files that you do not want changed into a user directory.

5.5.4 Rename the System Dump File

If you have a shared system dump file in SYS$COMMON:[SYSEXE], the shared dump file cannot have the name SYSDUMP.DMP. If you have a shared system dump file with this name, Compaq recommends that you rename it to SYS$COMMON:[SYSEXE]SYSDUMP-COMMON.DMP.

5.5.5 Analyze the System Disk

To analyze the system disk for inconsistencies and errors in the file structure, enter the following command:

```
$ ANALYZE/DISK_STRUCTURE SYS$SYSDEVICE
```

The following message represents normal behavior; you can ignore it:

```
%ANALDISK-I-OPENQUOTA, error opening QUOTA.SYS
```

If you find any other errors on the system disk, repair the errors by entering the following command:

```
$ ANALYZE/DISK_STRUCTURE/REPAIR SYS$SYSDEVICE
```

Refer to the *OpenVMS System Management Utilities Reference Manual* for more information on the ANALYZE/DISK_STRUCTURE command.

5.5.6 Check Page and Swap Files

Compaq recommends that the page file be located on the system disk in SYS$SPECIFIC:[SYSEXE] for the upgrade.

The swap file (SWAPFILE.SYS) does not need to be located on the system disk for the upgrade, but if it is located on the system disk, the file must be located in SYS$SPECIFIC:[SYSEXE].

If the upgrade procedure finds the page files and swap files in the common directory, it moves them to the system-specific directory before continuing.

The page file must be at least 4600 blocks. If the upgrade procedure detects fewer than 4600 blocks, it displays a message that gives you the option of continuing the upgrade or exiting the procedure and increasing the size of the page file. If you get this message, Compaq recommends that you exit the procedure, increase the page file to at least 4600 blocks, and restart the upgrade procedure.

To check the size of your page file and enter a new size if needed, use the following procedure:

1. To determine the size of the page file, enter the following command:

   ```
   $ @SYS$UPDATE:SWAPFILES
   ```

   The procedure displays the size of the page file and asks you to enter a new value, as follows:

   ```
   Enter new size for paging file:
   ```

   If the page file (PAGEFILE.SYS) size is greater than 4600 blocks, press Return. If it is less than 4600 blocks, enter 4600 and press Return.

2. If the swap and dump files are on the system disk, the procedure displays the sizes of each file. To keep the current values, press Return after each prompt.

   If the swap file is not on the system disk, the procedure asks if you want to create one. You do not need swap and dump files on the system disk for the upgrade procedure. Enter the appropriate response for your system.

   If you changed the size of the page file or created a swap file, a message is displayed that tells you to reboot the system. Do not reboot now. You will reboot later.

5.5.7 Check for Free Blocks

Check the system disk to make sure there is enough room for the upgrade. To determine whether you have enough room, enter the following command:

```
$ SHOW DEVICE SYS$SYSDEVICE
```

To upgrade the OpenVMS VAX *required* files, the minimum number of free blocks required is 48,950. Even if you plan to upgrade the OpenVMS *library* or *optional* files, you might not need more than 48,950 free blocks because many files are deleted as the upgrade progresses, thus freeing up additional space.

5.5.8 Check Quotas and Limits

Use the Authorize utility (AUTHORIZE) to make sure the SYSTEM account has sufficient quotas and limits. To check and, if necessary, modify quota and limit values, do the following:

1. Enter the following commands:

   ```
   $ SET DEFAULT SYS$SYSTEM
   $ RUN AUTHORIZE
   UAF> SHOW SYSTEM
   ```

   AUTHORIZE displays the SYSTEM account's quota and limit values.

2. Compare the values displayed on your screen to the following minimum required values:

Quota or Limit Name	Minimum Value
Open file quota (FILLM)	300
Buffered I/O limit (BIOLM)	18
Direct I/O limit (DIOLM)	18
AST limit (ASTLM)	24
Enqueue quota (ENQLM)	200
Buffered byte quota count (BYTLM)	32768†

†If you are using an InfoServer device to upgrade your system, increase the value of BYTLM to 33150

3. If necessary, adjust the quota and limit values in your SYSTEM account so that they are equal to or greater than the minimum required values.

   To change the value for a quota or limit, enter the MODIFY SYSTEM command using the following format:

   MODIFY SYSTEM/limit=new_value

   For example:

   ```
   UAF> MODIFY SYSTEM/DIOLM=18
   ```

4. Exit the Authorize utility by entering the following command:

   ```
   UAF> EXIT
   ```

5. If you adjusted the values for any of the SYSTEM account quotas or limits, log out and log back in to have the new values take effect.

5.5.9 Set System Parameters

During the upgrade procedure, the system is shut down and rebooted a number of times. You must boot the system minimum (STARTUP_P1 set to MIN) before you begin the upgrade (see Section 5.6). This prevents the startup of certain system integrated products and layered products on the system during each reboot. To set the system parameter STARTUP_P1 to MIN, enter the following commands:

```
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SET STARTUP_P1 "MIN"
SYSMAN> PARAMETERS WRITE CURRENT
SYSMAN> EXIT
```

Make sure the system parameters SCSNODE and SCSSYSTEMID are defined on your system. To determine whether these parameters are defined on your system, enter the following commands:

```
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS SHOW SCSNODE
SYSMAN> PARAMETERS SHOW SCSSYSTEMID
```

If SCSNODE and SCSSYSTEMID are not set correctly, enter the following commands where *node* is a 1- to 6-character unique DECnet node name and *systemid* is (DECnet area * 1024) + node number:

```
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SET SCSNODE "node"
SYSMAN> PARAMETERS SET SCSSYSTEMID systemid
SYSMAN> PARAMETERS WRITE CURRENT
   .
   .
   .
```

Make sure the system parameter VMS5 is set to 0. If your system has a KFQSA controller, the VMS5 parameter might have been set to a nonzero value for a previous upgrade. The VMS5 parameter is reserved for use by Compaq only.

To check the value of the VMS5 parameter, enter the following commands:

```
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SHOW VMS5
Parameter Name          Current   Default   Minimum   Maximum Unit  Dynamic
--------------          -------   -------   -------   ------- ----  -------
VMS5                          1         0         0        -1
```

If the current value of VMS5 is not 0, set it to 0 by entering the following commands:

```
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SET VMS5 0
SYSMAN> PARAMETERS WRITE CURRENT
SYSMAN> EXIT
```

5.5.10 Check AGEN$INCLUDE Files

During an upgrade, user disks are not mounted and SYLOGICALS.COM is not invoked, so AUTOGEN can access only data files that are on the system disk and whose file specification includes a logical name that is shipped as part of the OpenVMS operating system. Therefore, if you use AGEN$INCLUDE in SYS$SYSTEM:MODPARAMS.DAT to point to data files that are not on the system disk, follow these steps before you perform an upgrade:

1. Copy any files that you want AUTOGEN to include to a directory on the system disk.
2. For each file that you move, change the file specification on the AGEN$INCLUDE line in SYS$SYSTEM:MODPARAMS.DAT to point to the new location of the file on the system disk.

If you do not move referenced data files to the system disk, AUTOGEN uses whatever information is available during the upgrade and parameters might be set to values considerably different from what you intend.

5.5.11 Add Modified System Parameters to MODPARAMS.DAT

Any system parameter values that you modified and *did not* enter in MODPARAMS.DAT are lost during the upgrade. To retain the values of these parameters, enter their names in MODPARAMS.DAT and the value that AUTOGEN needs to add to the default minimum value.

For example, if you modified GBLPAGES by 128 pages above the default, add the following line to SYS$SYSTEM:MODPARAMS.DAT:

```
ADD_GBLPAGES=128
```

When AUTOGEN runs after the upgrade, it uses the values in MODPARAMS.DAT.

Section 5.6 tells you how to get your system ready for an upgrade.

5.6 Preparing the System

To prepare the system for the upgrade, use the procedure described in the following sections.

5.6.1 Enable Auto Restart or Manual Reboot

If your computer uses console media, set the computer to restart automatically. For some VAX computers this means setting one or more switches. For others, this means entering certain console mode commands. To determine how to enable auto restart, refer to the upgrade and installation supplement for your VAX computer.

If you have a system that does not use console media, set your system so you can reboot it manually. For more information, refer to the upgrade and installation supplement for your VAX computer.

5.6.2 Shut Down and Reboot the System

Shut down and reboot the system to activate any system parameters that you changed (STARTUP_P1, for example). To shut down the system, enter the following command:

```
$ @SYS$SYSTEM:SHUTDOWN
```

When the procedure asks if an automatic system reboot should be performed, type Y (for YES) and press Return.

After the system reboots, log in to the SYSTEM account.

5.6.3 Prevent Interactive Logins

To prevent users from logging in to the system during the upgrade, enter the following command:

```
$ SET LOGINS/INTERACTIVE=0
```

5.6.4 Check for DECnet

To determine whether your system is running DECnet for OpenVMS software, enter the following command:

```
$ SHOW LOGICAL SYS$NODE
```

If the system displays the following message, DECnet is not running on your system and you can proceed to Section 5.6.6:

```
%SHOW-S-NOTRAN, no translation for logical name SYS$NODE
```

If the system responds with a translation for SYS$NODE, then DECnet is running on your system.

If you set STARTUP_P1 to MIN as described in Section 5.5.9, DECnet should not be running. To set STARTUP_P1 to MIN, repeat all of the preceding steps beginning with Section 5.5.9. Note that you must shut down and reboot the system for any changes you make to system parameters to take effect.

5.6.5 Check for Volume Shadowing

Phase I (controller-based) volume shadowing is no longer available. Phase II (host-based) volume shadowing is designed to fully replace phase I with significantly enhanced features.

If you have volume shadowing software installed on your system but are unsure which phase, you can enter the following commands:

```
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SHOW SHADOWING
```

If the SHADOWING parameter is 1 or 3, then you have phase I volume shadowing software currently loaded on your system. For information about migrating to phase II, refer to *Volume Shadowing for OpenVMS*.

At the beginning of an upgrade, the procedure checks the setting of the SHADOWING system parameter. If you have not migrated to phase II and the procedure detects the presence of phase I, it displays the following message and asks if you want to continue the upgrade:

```
   The SHADOWING system parameter (currently set to 1) specifies
   phase I of volume shadowing, which is no longer available as of
   OpenVMS VAX Version 6.1.  If you continue with this upgrade, volume
   shadowing will not be present on your system after the upgrade has
   completed. Please consult the Volume Shadowing for OpenVMS manual
   for instructions about moving to phase II of volume shadowing.

* Do you want to continue the upgrade?
```

At that point, you can exit the upgrade procedure, follow the instructions in *Volume Shadowing for OpenVMS* for migrating to phase II volume shadowing, and restart the upgrade procedure from the beginning. If you continue with the upgrade without migrating to phase II, the volume shadowing software will not be present on your system after the upgrade has completed.

5.6.6 Stop Queues

To stop all batch and print queues on the node you are upgrading, enter the following command:

```
$ STOP/QUEUES/ON_NODE
```

It is not necessary to stop queues on nodes that you are not upgrading.

5.7 Gathering Information for the Upgrade

At different points during the upgrade, the procedure prompts you to supply information. To save time once the procedure begins, be sure you have the following information readily available. Remember, entering incorrect information during the upgrade could force you to repeat the entire upgrade procedure.

Required Information	Explanation
Device names	You will need to specify the device names for the drives that will hold the distribution media and the system disk.
Passwords	You will be prompted to type passwords of at least 8 characters for the SYSTEM, SYSTEST, and FIELD accounts.
Optional components and OpenVMS Management Station files	The upgrade procedure prompts you to specify whether you want to install the library (VMS072.C), optional (VMS072.D) OpenVMS components, and OpenVMS Management Station software PC files (VMS072.F). Appendix D lists the files included in these save sets. You can save some space on your system disk if you choose *not* to install these components, but be sure to review Appendix D before deciding.
Location for Help Message utility	Save set VMS072.E contains the online Help Message utility, which you can install on your system disk or on an alternate disk. (However, if you copied the distribution kit to some other media from which you will be performing the installation, you cannot install this save set on that media.)
DECwindows components	The installation procedure prompts you to specify which of the following DECwindows components you want to install: • DECwindows base support (required for running DECwindows software), which includes: – DECwindows transport – DECwindows keymaps • DECwindows workstation support (required for VAX workstations), which includes: – DECwindows X11 display server – Graphics drivers – 75 dots/inch video fonts – 100 dots/inch video fonts (option available only if you select DECwindows workstation support) Note that you must install the DECwindows Motif for OpenVMS (previously called VMS DECwindows Motif) layered product if you want to run the DECwindows software. DECwindows Motif for OpenVMS Version 1.2–3 (or 1.2 if the VAXMOTF05_012 remedial kit is installed) is the minimum supported version for systems running OpenVMS VAX Version 7.2. If you do not know which version of DECwindows Motif you are currently running on your system, you can check by entering the following command: `$ ANALYZE/IMAGE SYS$LIBRARY:DECW$XLIBSHR.EXE` Also note that the layered product does *not* have the DECwindows base and workstation support components. To get full DECwindows support, you must select the DECwindows components provided with the OpenVMS VAX Version 7.2 kit and install the separate DECwindows Motif for OpenVMS VAX layered product, which supports both Motif and XUI environments.

Required Information	Explanation
PAK information	The information listed on Product Authorization Keys (PAKs) for any new products you will register. You do not need to register your OpenVMS VAX license or the licenses for any System Integrated Products (SIPs) you are already running.

5.8 Preupgrade Checklist

Before you begin the upgrade procedure, use the following checklist to make sure you have completed all the necessary preupgrade tasks.

- ☐ Read the *OpenVMS Version 7.2 New Features Manual*, the *OpenVMS Version 7.2 Release Notes*, and any cover letters that came with your kit.
- ☐ Read the cautions and restrictions described at the beginning of this chapter and in Chapter 1.
- ☐ Make sure you have enough free blocks for the upgrade. You need at least 48,950 free blocks for the required files to start the upgrade. (Described in Section 5.5) The entire upgrade requires about 163,000 blocks.
- ☐ Set up your system to record the upgrade procedure on either a hardcopy terminal or a printer attached to the console terminal. If you do not do this, the screen messages will be lost. You need a transcript in case there is a problem during the upgrade. For information on how to connect a hardcopy device to your console to record the procedure, refer to the upgrade and installation supplement for your VAX computer.
- ☐ Check your AUTOGEN feedback information to be sure it is valid before rebooting the system. (Described in Section 5.3)
- ☐ Make a backup copy of the system disk and, if applicable, of the console media. (Described in the upgrade and installation supplement for your computer)
- ☐ If, in previous versions, your distribution kit provided standalone BACKUP on one of the following media types, make sure you have created a standalone BACKUP kit on one of the following media types:

  RX33
  TU58
  RX50
  RX01
  RL02

  (Described in Section 5.4)
- ☐ Make sure SYSUAF.DAT is in the SYS$COMMON:[SYSEXE] and VMS$AUDIT_SERVER.DAT is in the SYS$COMMON:[SYSMGR] directory. (Described in Section 5.5)
- ☐ Make sure SWAPFILE.SYS (if it is located on the system disk) and PAGEFILE.SYS are in the SYS$SPECIFIC:[SYSEXE] directory. (Described in Section 5.5)
- ☐ Make sure the page file is at least 4600 blocks. (Described in Section 5.5)
- ☐ If you have a shared system dump file in SYS$COMMON:[SYSEXE], make sure the shared file is not named SYSDUMP.DMP. (Described in Section 5.5)

Before Upgrading the OpenVMS VAX Operating System
5.8 Preupgrade Checklist

- ☐ If your system disk is part of a shadow set, create a nonshadowed system disk to upgrade. (Described in *Volume Shadowing for OpenVMS*)
- ☐ Make sure the SYSTEM account has sufficient quotas and limits. (Described in Section 5.5)
- ☐ Set the appropriate system parameters and make sure that STARTUP_P1 is set to MIN. (Described in Section 5.5)
- ☐ Define the system parameters SCSNODE and SCSSYSTEMID. (Described in Section 5.5)
- ☐ If your system has a KFQSA controller, make sure the VMS5 parameter is set to 0.(Described in Section 5.5)
- ☐ Check the location of your AGEN$INCLUDE files. (Described in Section 5.5.10)
- ☐ Set up the system to restart automatically. (Described in the upgrade and installation supplement for your VAX computer)
- ☐ Shut down and reboot the system from which you will perform the upgrade. If you are upgrading a VAXcluster, shut down all computers that boot from the system disk you are upgrading.
- ☐ Set interactive logins to 0.
- ☐ Shut down DECnet for OpenVMS software. (Described in Section 5.6)
- ☐ Migrate to phase II volume shadowing if you are currently using phase I. (Described in Section 5.6)
- ☐ Stop all batch and print queues on the node you are upgrading. (Described in Section 5.6)
- ☐ Make sure you have the following information (described in Section 5.7) available:
  - The device names of the drives that will hold the system disk and the distribution media.
  - Passwords of at least 8 characters for the SYSTEM, SYSTEST, and FIELD accounts.
  - A list of optional OpenVMS VAX components you want to install.
  - A list of optional DECwindows components you want to install.
  - The information listed on Product Authorization Keys (PAKs) for any new product licenses you will register.
- ☐ Create a command procedure to be used when booting from [SYSF]. See Appendix C.

To upgrade a standalone system, go to Chapter 7.

To upgrade a VAXcluster environment, go to Chapter 6.

6

Preparing to Upgrade in a VAXcluster Environment

This chapter describes how to upgrade a VAXcluster environment. Refer to *OpenVMS Cluster Systems* for more detailed information on VAXcluster environments.

6.1 Mixed-Version Support

If your cluster environment has both VAX and Alpha systems, also refer to *Migrating an Environment from OpenVMS VAX to OpenVMS Alpha*.

OpenVMS Alpha Version 7.2 and OpenVMS VAX Version 7.2 provide two levels of support for mixed-version and mixed-architecture OpenVMS Cluster systems. These two support types are *warranted* and *migration*.

Warranted support means that Compaq has fully qualified the two versions coexisting in an OpenVMS Cluster and will answer all problems identified by customers using these configurations.

Migration support is a superset of the Rolling Upgrade support provided in earlier releases of OpenVMS and is available for mixes that are not warranted. Migration support means that Compaq has qualified the versions for use together in configurations that are migrating in phases to a newer version of OpenVMS VAX or to OpenVMS Alpha. Problem reports submitted against these configurations will be answered by Compaq. However, in exceptional cases Compaq may request that you move to a warranted configuration as part of answering the problem.

Migration support will help you move to warranted OpenVMS Cluster version mixes with minimal impact on your cluster environment. Table 6–1 shows the level of support provided for all possible version pairings.

Table 6–1 VAX and Alpha OpenVMS Cluster Warranted and Migration Support

	V6.2	V7.1	V7.2
V6.2	WARRANTED	Migration	Migration
V7.1	Migration	WARRANTED	Migration
V7.2	Migration	Migration	WARRANTED

Note

Compaq does not support the use of Version 7.2 with Version 6.1 (or earlier versions) in an OpenVMS Cluster environment. In many cases, mixing Version 7.2 with versions prior to Version 6.2 will successfully

operate, but Compaq cannot commit to resolving problems experienced with such configurations.

6.2 Types of Upgrades

There are two types of cluster upgrades: **concurrent** and **rolling**. The type of upgrade you use depends on whether you want to maintain the availability of the cluster during the upgrade and whether you have more than one system disk. Review this chapter and then perform the preliminary tasks for the upgrade procedure (concurrent or rolling) that best suits your configuration.

6.2.1 Concurrent Upgrades

During a concurrent upgrade, you must shut down the entire cluster and upgrade each system disk. No one can use the cluster until you upgrade each system disk and reboot each VAX computer. If all systems in the VAXcluster environment are booted from one system disk, you must perform a concurrent upgrade.

Note

For OpenVMS VAX Version 7.2 concurrent upgrades, all nodes in the cluster must be running at least OpenVMS VAX Version 6.1. (See Section 5.1.10 for more information.)

To perform a concurrent upgrade, go to Section 6.3.

6.2.2 Rolling Upgrades

During a rolling upgrade, you can keep some of the VAX computers in the cluster running while you upgrade others (you must have more than one system disk). The cluster runs temporarily with different versions of the operating system.

Note

For OpenVMS VAX Version 7.2 rolling upgrades, all nodes in the cluster must be running at least OpenVMS VAX Version 6.1. (See Section 5.1.10 for more information.)

To perform a rolling upgrade, go to Section 6.4.

6.3 Concurrent Upgrade

This section describes the following:

- How a concurrent upgrade works.
- Tasks you need to perform to prepare your system for a concurrent upgrade.

6.3.1 How a Concurrent Upgrade Works

During a concurrent upgrade, you must shut down the entire cluster and upgrade each system disk and reboot each VAX computer in the cluster. When the cluster reboots, each VAX computer will be running the upgraded version of the OpenVMS VAX operating system.

6.3.2 Preparing for a Concurrent Upgrade

To prepare for a concurrent upgrade, use the following procedure:

1. Shut down the entire cluster by logging in to the SYSTEM account on each node *locally*, entering the following command, and choosing the CLUSTER_SHUTDOWN option:

   ```
   $ @SYS$SYSTEM:SHUTDOWN
   ```

2. If you have only one system disk for your cluster, go to step 3.

   If you have more than one system disk, select one to upgrade.

   Caution

   You cannot use the system disk that you usually use as the quorum disk to hold the save sets from the distribution kit.

3. Perform a conversational boot of a single VAX computer from the system disk you will be upgrading. For more information about the conversational boot procedure, refer to the upgrade and installation supplement for your VAX computer.

   At the SYSBOOT> prompt, use the SHOW VOTES and SHOW EXPECTED_VOTES command to display the current values of the parameters. Write these values down because you will need to restore them later. Set the VOTES and EXPECTED_VOTES values to 1 by entering the following commands:

   ```
   SYSBOOT> USE CURRENT
   SYSBOOT> SET VOTES 1
   SYSBOOT> SET EXPECTED_VOTES 1
   SYSBOOT> CONTINUE
   ```

4. Upgrade the system disk, using the procedure in Chapter 7.
5. If you have only one system disk, go to step 6.

   If you have more than one system disk, shut down the system that you just upgraded. Then repeat steps 2 through 4 to upgrade each system disk in the cluster. When you finish upgrading all of the system disks, go to step 6.

6. Reboot each computer in the VAXcluster environment.
7. Complete the postupgrade procedures described in Chapter 8.

6.4 Rolling Upgrade

This section describes the following:

- How a rolling upgrade works.
- Notes and restrictions.
- Tasks you need to perform to prepare your system for a rolling upgrade.

6.4.1 How a Rolling Upgrade Works

During a rolling upgrade, you upgrade each system disk individually, allowing old and new versions of the operating system to run together in the same cluster, creating a mixed-version cluster. Because rolling upgrades allow **mixed-version** clusters, the systems that you are not upgrading remain available.

6.4.2 Notes and Restrictions

The following restrictions apply to rolling upgrades:

- Compaq recommends that all VAX computers in a cluster run the same version of the operating system. Mixed-version clusters are supported *only* for the purpose of upgrading the entire cluster incrementally. Compaq further recommends that all VAX systems in a VAXcluster run the latest version of the OpenVMS VAX operating system.
- A rolling upgrade does not apply when all systems boot from a single system disk. When all systems boot from a single system disk, perform a concurrent upgrade using the procedure described in Section 6.3.
- During the rolling upgrade, the queuing system is disabled on the nodes being upgraded. The queuing system on the other nodes should be unaffected by the upgrade as long as a START/QUEUE/MANAGER/ON=(upgrade node . . .) command is not executed. A START/QUEUE/MANAGER command could attempt to move the queue manager process to the node being upgraded if the /ON qualifier indicates that it is one of the preferred nodes. If the queue manager attempts to run on the node being upgraded, the queuing system will hang on the entire cluster.

  If your startup file contains a START/QUEUE/MANAGER/ON=(upgrade node1, node2 . . . node*n*) command, do not boot in any nonupgrading nodes until you have removed that command from the startup file. Booting in a node causes the queuing system to hang on the cluster if the START/QUEUE /MANAGER/ON=(upgrade node, . . .) command is executed. When the upgrade has completed, you can add the command back to the startup file.

  If the cluster queuing system hangs during the upgrade, it is most likely caused by the queue manager attempting to run on the upgrading node. To clear the condition, move the queue manager to a node you are not upgrading by entering the following command:

  START/QUEUE/MANAGER/ON=(nonupgrading node1,-
  node2 . . . node*n*)

6.4.3 Preparing for a Rolling Upgrade

To prepare for a rolling upgrade, follow these steps:

1. Check the votes and make adjustments to maintain the proper quorum so the cluster can continue to operate throughout the upgrade. (*OpenVMS Cluster Systems* describes this procedure in detail.)
2. Select a system disk to upgrade.
3. Shut down all VAX computers booting from the system disk that you are upgrading, except for the computer that you will use to apply the upgrade. VAX computers that do not boot from the system disk that you are upgrading remain available to users.

   a. Log in to the SYSTEM account on the VAX computer you are shutting down.

b. Enter the following command:

```
$ @SYS$SYSTEM:SHUTDOWN.COM
```

c. On one of the VAX computers that is still running, enter the following command:

```
$  SET CLUSTER/EXPECTED_VOTES
```

d. Repeat steps a to c for each VAX computer requiring a shutdown.

This procedure lets one VAX computer continue running from the system disk (assuming computers running from different system disks supply enough votes to sustain cluster quorum).

4. If proper quorum is not maintained at any time during the upgrade procedure, the shutdown procedure will hang the cluster. If the cluster hangs during a shutdown, enter the following commands on the system console of a CPU that is still a cluster member:

```
$ Ctrl/P
>>> H
>>> D/I 14 C
>>> C
IPC> Q
IPC> Ctrl/Z
```

5. Upgrade the system disk using the procedure in Chapter 7.

Caution

The upgrade procedure requires exclusive access to the drive that holds the distribution media. Do not mount the distribution media on other nodes.

6. During phase 1 of the upgrade, the procedure asks if you are performing a rolling upgrade. If you enter Y, the procedure asks you several questions to determine if all system disks in the cluster (other than the one you are upgrading) are running at least OpenVMS VAX Version 6.2. For example:

```
* Are the other system disks running OpenVMS V6.2 or higher?
```

All systems in the cluster must be running at least OpenVMS VAX Version 6.2 to perform the rolling upgrade. Type Y and press Return.

7. When the upgrade has completed, reboot each VAX computer that boots from the system disk you have just upgraded.
8. Perform the postupgrade tasks described in Chapter 8.
9. Repeat steps 2 to 7 for each system disk you are upgrading. Once you have performed tasks *a* to *d* in step 3, you do not need to perform them again.

6.5 Adding an OpenVMS VAX Version 7.2 Supported CPU

If you need to add a new CPU supported by OpenVMS VAX Version 7.2 to an existing Version 6.2 VAXcluster, Compaq supports two options, listed in the following preferred order:

1. Upgrade the entire cluster to OpenVMS VAX Version 7.2 and bring the new CPU in as a member.

2. If you need to keep some systems in the cluster at OpenVMS VAX Version 6.2, you must upgrade a system disk in the cluster to Version 7.2 using the rolling upgrade procedure and then boot the new CPU into the cluster using that system disk.

7

Upgrading the OpenVMS VAX Operating System

This chapter explains the procedure for upgrading a single OpenVMS VAX system disk, including:

- How to prepare for booting from the [SYSF] directory
- How to configure devices
- How to begin the upgrade
- What the procedure does and what you are asked to do during the six phases of the upgrade

You must complete each phase of the upgrade procedure. On most VAX computers, the upgrade procedure continues automatically from phase to phase. Read the screen displays carefully and, if you need to reboot your VAX computer manually, refer to the upgrade and installation supplement for your VAX computer and Appendix C of this manual.

The time required to complete an upgrade varies depending on your hardware configuration and on the distribution media you are using. In most cases, magnetic tapes and tape cartridges require more time than compact discs.

Before you begin the upgrade procedure, read the overview of the upgrade procedure described in Chapter 1 and complete the preupgrade tasks described in Chapter 5. If you are upgrading a VAXcluster, you must also read Chapter 6.

7.1 Preparing to Boot from [SYSF]

During the upgrade procedure, you are asked to boot the system from the [SYSF] directory on the system disk. The [SYSF] directory is a root directory created on the system disk by the upgrade procedure. It temporarily holds the system files used in the upgrade until the procedure moves the files to their permanent location. The upgrade procedure then removes the [SYSF] directory from the system disk.

If you do not know how to boot from [SYSF], read the upgrade and installation supplement for your VAX computer and Appendix C of this manual.

Ignore any error messages after the first reboot that indicate an invalid dump header version. These messages are normal and are to be expected.

7.1.1 Modifying Boot Command Procedures

Some VAX computers require a special command procedure to boot from [SYSF]. If you are performing an upgrade on one of the following VAX computers, you must modify the boot command procedures, DEFBOO and *ddd*GEN before beginning the upgrade procedure:

VAX 8530, 8550, 8700, 8810, 8820-N
VAX 8820, 8830, 8840

To modify the boot command procedures, exit from the OpenVMS VAX operating system (but do not shut it down) and enter the appropriate console mode. Make copies of DEFBOO and *ddd*GEN before you modify them. Name the copies DEFBOO.SAV and *ddd*GEN.SAV.

The upgrade and installation supplement for your VAX computer describes the procedures for copying and modifying DEFBOO and *ddd*GEN. Use these procedures to modify DEFBOO and *ddd*GEN so that they specify [SYSF] as the directory from which to boot.

In DEFBOO, change the DEPOSIT command that sets boot flags in register 5 (R5) as follows:

```
DEPOSIT R5=F0000000
```

In *ddd*GEN, change the DEPOSIT command as follows:

```
DEPOSIT R5 F0000001
```

7.1.2 VAX 8200, 8250, 8300, and 8350 Computers

If you are upgrading a VAX 8200, 8250, 8300, or 8350 computer, you must create a boot command procedure that allows you to boot from the [SYSF] directory before beginning the upgrade. The upgrade and installation supplement for your VAX computer describes how to create this boot command procedure.

7.1.3 Configuring Devices

Because you rebooted your system with minimum startup, the system did not automatically configure all devices. However, you might need access to some of the devices to perform the upgrade.

To make sure you can access the devices that might be needed for the upgrade, run SYSGEN to reconfigure the devices on the system and run STARTUP CONFIGURE by entering the following commands:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> AUTOCONFIGURE ALL
SYSGEN> EXIT
$ @SYS$SYSTEM:STARTUP CONFIGURE
```

7.2 Performing the Upgrade

This section describes how to start the upgrade procedure using VMSINSTAL. You can type a question mark (?) for help at any time while running VMSINSTAL.

The instructions refer to the *source drive* and the *target drive*, where:

- The source drive is the drive that holds the distribution kit.
- The target drive is the drive that holds the system disk.

7.2.1 Loading Distribution Media

Place the distribution compact disc or tape in the source drive. If your OpenVMS VAX distribution kit contains several tapes, put the first one in the drive. The paper labels on the tapes indicate the order in which you use them.

If you are not using an InfoServer device, go to Section 7.2.3.

If you are using an InfoServer device, proceed to the next section.

7.2.2 Upgrading from the InfoServer

If upgrading from an InfoServer device, perform the following steps:

1. Start the InfoServer Client software by entering the following command:

   ```
   $ @SYS$STARTUP:ESS$STARTUP CLIENT
   ```

   The CLIENT parameter loads the client driver, ESS$DADDRIVER.EXE, and the InfoServer transport driver, ESS$LASTDRIVER.EXE.

2. As the startup procedure executes, it displays the following messages:

   ```
   %LASTCP-I-VERSION, LASTDRIVER X1.5 is stopped
   %LASTCP-I-ADAINIT, Initializing adapter xxx for LASTDRIVER
   %LASTCP-I-STARTED, LASTDRIVER X1.5 started on node yyy
   ```

3. After you start the InfoServer Client software, you must make the compact disc drive accessible to your system by completing the following steps:

   a. Insert the distribution compact disc in the compact disc drive connected to the InfoServer.

   b. Enter the following commands:

      ```
      $ RUN SYS$SYSTEM:ESS$LADCP
      LADCP> BIND/CONNECT/SYSTEM VAXVMS072
      %LADCP-I-BIND, service bound to logical unit DAD$VMS072 (_DADn:)
      LADCP> EXIT
      ```

      Make note of the device name _DADn: in the previous display. You will have to specify this device name during the upgrade.

7.2.3 Starting VMSINSTAL

To start VMSINSTAL, use the following procedure:

1. Log in to the SYSTEM account.
2. Enter the following command:

   ```
   $ @SYS$UPDATE:VMSINSTAL
   ```

VMSINSTAL displays a message similar to the following, depending on which version of the operating system is currently running on your system:

```
        OpenVMS VAX Software Product Installation Procedure V7.2

It is 13-NOV-1998 at 10:08.

Enter a question mark (?) at any time for help.
```

VMSINSTAL checks your system's account quotas. If it finds account quotas that are less than it expects, VMSINSTAL displays a message similar to the following:

```
%VMSINSTAL-W-LOWQUOTA, The following account quotas may be too low.
-VMSINSTAL-W-LOWQUOTA, If you want to modify these account quotas, type NO to
-VMSINSTAL-W-LOWQUOTA, the next question, modify the appropriate quotas, log out
-VMSINSTAL-W-LOWQUOTA, then log back in and restart this procedure.

         BYTLM: currently 32512; minimum expected 32768

* Do you want to continue anyway [NO]?
```

You should have verified that your SYSTEM account quotas were sufficient before beginning the upgrade. (See Section 5.5.8 for the minimum required values and for instructions for modifying quotas and limits.)

To modify the account quotas now, do the following:

1. Type No and press Return.
2. Modify the account quotas you want to change.
3. Log out of the SYSTEM account; then log back in so that the new quotas will be in effect.
4. Restart VMSINSTAL.

To continue the upgrade without modifying the account quotas, type Yes and press Return.

7.2.4 Backing Up the System Disk

The procedure displays the following message:

```
* Are you satisfied with the backup of your system disk [YES]?
```

If you have made a standalone BACKUP of the system disk, press Return and go to Section 7.2.5.

If you have not made a standalone image backup of the system disk, do the following:

1. Type N (for No) and press Return. VMSINSTAL ends and the dollar-sign prompt ($) is displayed.
2. Back up the system disk as described in the upgrade and installation supplement for your VAX computer.
3. After you have made a backup of the system disk, start the upgrade procedure again.

Note

If the upgrade procedure fails and you do not have a current backup of the system disk that you are upgrading, you may not be able to recover to the previous version of the operating system.

7.2.5 Specifying the Source Drive

VMSINSTAL asks for the name of the drive that holds the distribution media:

```
* Where will the distribution volumes be mounted:
```

Enter the device name of the source drive. For example, if you have a VAX 6000 series computer that has a TK70 with a device name of MUC6, type *MUC6* and press Return.

If the drive is connected to an HSC, enter the HSC name and the device name of the drive separated by a dollar sign ($). (If you do not enter the device name in this manner, it will cause a failure in Phase 2.) For example, if the HSC name is MUTT and the device name is MUA0, enter the following and press Return:

```
* Where will the distribution volumes be mounted: MUTT$MUA0
```

If you are not using an InfoServer device, proceed to Section 7.2.6.

If you are upgrading from a compact disc drive connected to an InfoServer, the device name is DAD*n*. The *n* part of the device name was displayed when you bound to the distribution compact disc as previously described in Section 7.2.2.

If VMSINSTAL displays an error message, make sure the drive is connected and set up properly. Enter the name again. If VMSINSTAL displays another error message, use the following procedure to verify the device name:

1. Press Ctrl/Y to exit from VMSINSTAL.
2. Enter the SHOW DEVICE command to make sure you have the correct device name.
3. Restart the upgrade procedure from Section 7.2.3.

If VMSINSTAL does not display an error message, proceed to Section 7.2.6.

7.2.6 Entering the Product Name

When VMSINSTAL displays the following message, type VMS072 and press Return. Make sure that you use the number zero (not the letter ‘‘O’’) when you type VMS072. For example:

```
Enter the products to be processed from the first distribution volume set.
* Products: VMS072
```

When the procedure displays the following message, press Return:

```
* Enter installation options you wish to use (none):
```

7.2.7 Mounting the First Volume

VMSINSTAL displays a message similar to the following:

```
Please mount the first volume of the set on DKB200:.
```

When the procedure displays the following message, type Y (for Yes) and press Return:

```
* Are you ready? Y
```

The procedure displays messages similar to the following:

```
%MOUNT-I-MOUNTED, VAXVMS072 mounted on _VXPCSI$DKB200:

The following products will be processed:

  VMS V7.2
```

After a slight pause, the procedure displays a message similar to the following:

```
       Beginning installation of VMS V7.2 at 10:08
%VMSINSTAL-I-RESTORE, Restoring product saveset A ...
```

7.2.8 Monitoring Messages from VMSINSTAL

The upgrade procedure displays several important messages that provide you with the following information:

- What VMSINSTAL is doing.
- Notes, suggestions, and restrictions about various parts of the upgrade.
- Status of the upgrade.

Read these messages carefully to decide whether or not you need to interrupt the upgrade procedure. An interruption is allowed before Phase 1. The procedure displays the following message:

```
* Do you want to continue? (Y/N):
```

To continue the upgrade, type Yes and press Return.

To interrupt the upgrade, do the following:

1. Type No and press Return.
2. If prompted for another product, type EXIT to exit from VMSINSTAL.

7.2.9 Verifying the Date and Time

The procedure displays the current date and time. If the date and time are correct, type Yes. If they are incorrect, type No. Enter the correct date and time using the 24-hour clock format and press Return. For example:

```
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 13-NOV-1998 10:19
```

7.3 Upgrade Phase 1

This section describes Phase 1 of the upgrade. During this phase, you provide passwords for system accounts and select OpenVMS options, and the procedure restores the files in the OpenVMS *required* save set (VMS072.B).

At the end of this phase, the procedure shuts down your VAX computer. If your computer uses console media when booting and the boot file was modified as described in Section 7.1, the system should reboot automatically. Otherwise, you must reboot manually from the SYSF directory.

7.3.1 Specifying the Type of Upgrade

At the beginning of Phase 1, the procedure displays a message similar to the following:

```
    Upgrade Phase 1  13-NOV-1998 10:19:30.85
* Are you performing a rolling upgrade? (Y/N):
```

If you are performing a concurrent upgrade or an upgrade on a standalone system, type No and press Return.

If you are performing a rolling upgrade, type Yes and press Return. The procedure asks you several questions to determine if all system disks in the cluster (other than the one you are upgrading) are running at least OpenVMS VAX Version 6.2. Follow the instructions in Section 6.4.

7.3.2 SYSTEST and FIELD Account Creation

If your system does not have SYSTEST or FIELD accounts, you will be given the opportunity to create them at this time. These accounts are not required for normal operation of OpenVMS. The User Environment Test Program (UETP) uses SYSTEST to perform its functions. If this account does not exist you will have to create it in order to run UETP. FIELD is traditionally used for field service access. If this account does not exist, you may have to create it later or provide an alternate account for field service.

```
SYSTEST account does not exist ...
* Do you want to create this account? (Y/N):

FIELD account does not exist ...
* Do you want to create this account? (Y/N):
```

7.3.3 Entering Passwords

To ensure system security, the upgrade procedure requires you to enter passwords for the SYSTEM, SYSTEST, and FIELD accounts before continuing. Passwords must contain at least 8 characters; they are not displayed by the system. Press Return after you enter each password and it will be verified. You will not be prompted for SYSTEST and FIELD passwords if those accounts do not exist. For example:

```
To help provide a more secure system, you are asked to enter passwords
for key system accounts. Passwords must be a minimum of 8 characters
in length. You can enter new or existing passwords.

Enter passwords for the following accounts:

             SYSTEM, SYSTEST, FIELD

* Enter password for SYSTEM:
* Reenter for verification:
%UAF-I-MDFYMSG, user record(s) updated
%VMS-I-PWD_OKAY, account password for SYSTEM verified

* Enter password for SYSTEST:
* Re-enter for verification:
%UAF-I-MDFYMSG, user record(s) updated
%VMS-I-PWD_OKAY, account password for SYSTEST verified

     The SYSTEST_CLIG account will be disabled.  You must reenable
     it before running UETP but do not assign a password.

* Enter password for FIELD:
* Reenter for verification:
%UAF-I-MDFYMSG, user record(s) updated
%VMS-I-PWD_OKAY, account password for FIELD verified
```

If you enter a password incorrectly or if the password is too easy to guess, the procedure displays error messages similar to the following:

```
%VMS-W-PWD-INVALID, account password for SYSTEST is invalid
%VMS-I-PWD-WEAK, password is too easy to guess

Because of the preceding error, you must take action to secure this account.
You must either disable this account, change its password, or do both.
```

When the procedure asks if you want to disable the account, type No and press Return. When the procedure asks if you want to enter a new password, type Yes and press Return. Then enter a new password. For example:

```
Do you want to disable the account (Y/N)? N
Do you want to change the account password (Y/N)? Y
You must now select a new primary password for the SYSTEST account. The
password you select must be at least 8 characters in length and cannot be
the same as the name of the account.

New password:
Verification:
%UAF-I-MDFMSG, user record(s) updated
%VMS-I-PWD-SET, primary password for account SYSTEST set
```

After you have correctly entered the passwords, the procedure does the following:

- Checks the account quotas in the DEFAULT, SYSTEM, and various other accounts and modifies them if necessary
- Turns off quotas on the system disk
- Stops OPCOM
- Stops the error formatter (ERRFMT)

7.3.4 Choosing the Boot Method

If your VAX computer is *not* one of the following, go to Section 7.3.5.

VAX–11/730
VAX–11/750
VAX–11/780
VAX 8200, 8250, 8300, 8350
VAX 8600, 8650
VAX 9000

If your VAX computer is included in the preceding list, the procedure can temporarily modify the DEFBOO.CMD (or DEFBOO.COM if you have a VAX 8600 computer) to boot from the [SYSF] directory. During Phase 4 of the upgrade, the procedure restores the DEFBOO.CMD (or DEFBOO.COM) file that is set up to boot from the current system disk and system root.

The procedure displays a message similar to the following (*except for* VAX–11/730, 11/780, and 8600 computers):

```
* Do you want to boot from the [console media]?
```

If you prefer to boot your system manually from the [SYSF] directory or if you are booting directly from a local system disk, type No, press Return, and go to Section 7.3.5 to continue the upgrade.

Type Yes and press Return if one of the following is true:

- You want to boot from the console media.
- Your computer is a VAX–11/730, 11/780, or 8600.
- You are using a CI750.

The procedure prompts you to insert the console media in the drive. Insert the backup copy of the console media into the drive and do not remove it from the drive until the upgrade has been completed. Make sure the console media is write enabled.

7.3.5 File Cleanup

The procedure does the following:

- Checks for the location of the SYS$TIMEZONE.DAT file, which must now be in the SYS$COMMON:[SYSEXE] directory. If the procedure finds this file in some other directory, it deletes it from that directory. Later, during the final phase of the upgrade, the procedure prompts you for the information it needs to create a SYS$TIMEZONE.DAT file in the SYS$COMMON:[SYSEXE] directory.
- Renames files found in SYS$SPECIFIC:[SYSMGR] and in SYS$COMMON:[SYSMGR] by adding _OLD_SPECIFIC to the file extensions. For example, [SYSMGR]LOGIN.COM becomes [SYSMGR]LOGIN.COM_OLD_SPECIFIC. (The file extensions are restored during Phase 6 of the upgrade procedure.)
- Cleans up the system disk by purging all accounting data files, operator logs, and the directory SYSERR. The procedure also deletes all JNL files in the root directory and its subdirectories.
- Builds the directory tree [SYSF] and deletes the OpenVMS VAX and DECwindows files that are not needed to reboot during Phase 2 of the upgrade.

As the procedure performs each of these tasks, it displays messages describing what is being done. When this step is completed, the procedure displays a message similar to the following:

```
File cleanup complete - 13-NOV-1998 10:34:16.34
```

7.3.6 Selecting Optional OpenVMS Components

The procedure displays information about optional OpenVMS VAX files and the remaining amount of disk space. The information is similar to the following (block sizes might vary slightly):

```
Select optional software you want to install. You can install one
or more of the following OpenVMS or DECwindows components:

o OpenVMS library                              -  52200 blocks
o OpenVMS optional                             -  19000 blocks
o OpenVMS Help Message                         -  10400 blocks
o OpenVMS Management Station                   -  20000 blocks
o DECwindows base support                      -   4400 blocks
o DECwindows workstation support               -  23800 blocks
      -  75 dots per inch video fonts          -   (included)
      - 100 dots per inch video fonts          -   6200 blocks
o DECnet-Plus networking                       -  80000 blocks
o DECnet Phase IV networking                   -    800 blocks

Space remaining on system disk: 1674710 blocks
```

You must indicate which of the options you want to install. If you require network support, you must select the OpenVMS library component.

Note that if you do not install the optional OpenVMS components at this time, you can install them after the upgrade by using the VMSTAILOR and DECW$TAILOR utilities. However, the Help Message utility can be tailored on (added) to the system disk only. If you do not choose to install the Help Message files at this point in the procedure and want them on an alternate device, you will not be able to use VMSTAILOR to restore them later. If you want to install Help Message files on an alternate disk *after* the installation procedure completes, you can use the BACKUP command, as follows:

BACKUP/VERIFY source-device:[000000]VMS072.E/SAVE_SET-
target-device:[directory-name]

For *source-device*, enter the device name for the drive on which the distribution media is mounted. For *target-device*, enter the device name on which the alternate disk is mounted, and for *directory*, enter the name of the directory to which you are copying the files.

Also note that, for TK50 tape cartridges, it is quicker to install OpenVMS VAX software during the upgrade than to add software after the upgrade with a tailoring utility. For information about using VMSTAILOR, see Chapter 10. To select the options you want to install, follow the instructions displayed by the procedure.

7.3.6.1 OpenVMS Library Files

The procedure displays the following message:

```
* Do you want to install the OpenVMS library files? (Y/N)
```

The file subclasses of the OpenVMS *library* (VMS072.C) save set are listed in Appendix D. If you want to install the VMS072.C files, type Yes and press Return. If you require network support, you must select the OpenVMS library component. If you do *not* want to install the VMS072.C files, type No and press Return.

7.3.6.2 OpenVMS Optional Files

The procedure displays the following message:

```
* Do you want to install the OpenVMS optional files? (Y/N)
```

The file subclasses of the OpenVMS *optional* (VMS072.D) save set are listed in Appendix D. If you want to install the VMS072.D files, type Yes and press Return. If you do *not* want to install the VMS072.D files, type No and press Return.

7.3.6.3 Help Message Files

The procedure displays the following message:

```
    The Help Message utility (MSGHLP) provides online explanations
    and user actions for OpenVMS messages in place of the hardcopy
    OpenVMS System Messages and Recovery Procedures Reference Manual,
    which is now separately orderable.

    The MSGHLP database, MSGHLP$LIBRARY.MSGHLP$DATA, consumes
    approximately 10400 blocks and will be placed by default
    on your system disk in SYS$COMMON:[SYSHLP] unless you specify an
    alternate device when prompted.

* Do you want to install the MSGHLP database? (Y/N)
```

The Help Message utility is an online system for system messages documentation. You can install Help Message either on the system disk or on an alternate disk. If you want to install the Help Message files, type Yes and press Return.

The procedure displays the following message:

```
    You can install this database on your system disk in SYS$COMMON:[SYSHLP]
    or on an alternate device. If you specify an alternate device, but no
    directory, MSGHLP$LIBRARY.MSGHLP$DATA is placed in [HELP_MESSAGE]. When
    prompted, take the default of the system disk or specify an alternate
    device using this format:

                            device:[directory]

* Where do you want to install the MSGHLP database? [SYS$COMMON:[SYSHLP]]

    Space remaining on system disk:  1593110 blocks
```

The Help Message database is installed in the area you specified.

7.3.6.4 OpenVMS Management Station Files

The procedure displays the following message:

```
   The OpenVMS Management Station is a client-server application
   that provides OpenVMS system management capabilities through a
   client application on a personal computer (PC) running Microsoft
   Windows. The server application runs on OpenVMS systems and is
   automatically installed as part of the OpenVMS operating system.

   This option provides the files used to create the installation
   media for the PC client software.  If you want to use the OpenVMS
   Management Station, you must install these optional files on at
   least one OpenVMS system to create the installation media, which
   can then be used to install the PC client on one or more PCs.

   The OpenVMS Management Station client can run on Windows 3.1
   (including Windows for Workgroups), Windows NT, or Windows 95.

   The OpenVMS Management Station optional files consume approximately 20000
   blocks and will be placed on your system disk in SYS$COMMON:[TNT.CLIENT].

* Do you want to install the optional OpenVMS Management Station files? (Y/N)

   Space remaining on system disk: 1573110 blocks
```

If you want to use the OpenVMS Management Station software, you must install these files. After the upgrade procedure completes, follow the instructions in Appendix G to prepare your OpenVMS system and your PC to run the OpenVMS Management Station server and client software.

7.3.7 Choosing DECwindows Support Options

Next, the procedure displays messages about the DECwindows components shipped with OpenVMS VAX Version 7.2.

The OpenVMS VAX operating system no longer ships the OpenVMS DECwindows product. The operating system now ships only the DECwindows base support and DECwindows workstation support components. To get full DECwindows support, you must also install the separate DECwindows Motif for OpenVMS VAX (previously called VMS DECwindows Motif) layered product, which supports both Motif and XUI environments.

Note that the DECwindows base support and DECwindows workstation support components are *not* shipped with the DECwindows Motif for OpenVMS layered product. If you want to install these options, you must select them now or use the DECW$TAILOR option after the installation procedure completes.

Before you indicate whether you want to install DECwindows support software, consider the following:

If you...	Then choose...
Intend to install the DECwindows Motif layered product	DECwindows base support.
Intend to install the DECwindows Motif layered product on a workstation or on a VAXcluster system that contains workstations	DECwindows base support and DECwindows workstation support.
Are *not* planning to install the DECwindows Motif layered product but are installing OpenVMS VAX on a workstation or on a VAXcluster that includes workstations	DECwindows base support and DECwindows workstation support.

If you...	Then choose...
Want to provide font files for X terminals	DECwindows base support and DECwindows workstation support.
Have a workstation monitor (for example, a VR150, VR160, or VR295) capable of displaying 100 dots/inch or a VAXstation 4000 series computer, which uses 100 dots /inch video fonts by default	DECwindows base support and DECwindows workstation support with the 100 dots/inch option. By selecting the workstation support files, you automatically get 75 dots/inch video font files, and you will be prompted to indicate if you want to install 100 dots/inch video font files.

The procedure displays the following:

```
    You can select DECwindows now, or you can use the DECW$TAILOR utility
    to provide or remove DECwindows support after upgrade.

    Some media, TK50s in particular, can be very slow when tailoring on files.
    You might want to select DECwindows now and tailor off unwanted files later.

    NOTE: This kit does NOT contain full DECwindows.
          To obtain full DECwindows, you must also install the separate
          layered product, DECwindows Motif for OpenVMS VAX.
          Version 1.2-3 is the minimum version of DECwindows Motif for OpenVMS VAX
          that can be used with OpenVMS VAX V7.2.

    The DECwindows components provided in this kit require approximately
    34400 blocks, broken down as follows:

         o DECwindows base support                    -   4400 blocks
         o DECwindows workstation support             -  23800 blocks
           -  75 dots per inch video fonts                (included)
           - 100 dots per inch video fonts (optional) -   6200 blocks

     You must select the DECwindows base support option if
         - you plan to run DECwindows software, or
         - you are installing this kit on
             * a workstation or
             * a VAXcluster that contains workstations, or
         - you want to provide font files for Xterminals.

     If you are installing this kit on a system that includes Xterminals
     and you do NOT select DECwindows base support, then you will have to use
     the DECW$TAILOR utility to provide font files.

* Do you want the DECwindows base support? (Y/N) y

     Space remaining: 1568710 blocks


     You must select the DECwindows workstation support option if
         - you are installing this kit on
             * a workstation or
             * a VAXcluster that contains workstations, or
         - you want to provide font files for Xterminals.

     If you are installing this kit on a system that includes Xterminals
     and you do NOT select DECwindows workstation support, then you will have
     to use the DECW$TAILOR utility to provide font files.

* Do you want to provide DECwindows workstation support? (Y/N) y

     Space remaining:  1544910 blocks


     DECwindows workstation support includes the 75 dots per inch video fonts.

     All DECwindows applications run with 75 dots per inch video fonts.
     By default, most systems start up with 75 dots per inch video fonts.
     Certain applications can take advantage of 100 dots per inch video fonts.

     For the VAXstation 4000 series machine, 100 dots per inch video fonts
     are used by default.  If you decide not to install 100 dots per inch
     video fonts, you must edit SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.COM
     to force 75 dots per inch video fonts to be the default.  Otherwise,
     certain applications may not space text properly.

     For instructions on how to configure your system with both 75 and 100
     dots per inch video fonts, see the installation guide or look at the
     template command procedure SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.TEMPLATE.

*Do you want 100 dots per inch video fonts installed? (Y/N) y

   Space remaining:  1538710 blocks
```

7.3.8 Upgrading Networking Products

Next, the procedure displays messages describing the DECnet options. For more information, refer to Section 1.1.2.

```
    Beginning with OpenVMS V7.1, the DECnet-Plus kit is provided with
    the OpenVMS operating system kit.  DIGITAL strongly recommends that
    DECnet users install DECnet-Plus.  DECnet Phase IV applications are
    supported by DECnet-Plus.

    DECnet Phase IV is also provided as an option.  Support for DECnet
    Phase IV is available through a Prior Version Support Contract
    available through Digital's MCS Services.

    If you install DECnet-Plus and TCP/IP you can run DECnet
    applications over a TCP/IP network.  Please see the OpenVMS
    Management Guide for information on running DECnet over TCP/IP.

    If you plan to install DECnet Phase IV, do NOT select DECnet-Plus.

* Do you want to install DECnet-Plus. (Y/N) y
```

If you are upgrading from OpenVMS VAX Version 7.1 and are changing DECnet products, the procedure prompts you to remove the version of DECnet installed on your system. You *must* remove this DECnet product because both DECnet-Plus and DECnet Phase IV products cannot run concurrently on your system.

The following message shows an upgrade from DECnet Phase IV to DECnet-Plus:

```
* Do you want to install DECnet-Plus? (Y/N) y

    DECnet Phase IV is intalled on your system.
    Before installing DECnet-Plus, you must remove DECnet Phase IV.

*Do you want to remove DECnet Phase IV? (Y/N) y

The following product has been selected:
    DEC VAXVMS DECNET_PHASE_IV V7.1          Layered Product

Portion done: 0%...10%...20%...30%...40%...50%...60%...70%...80%...100%

The following product has been removed:
    DEC VAXVMS DECNET_PHASE_IV V7.1          Layered Product

    Space remaining on system disk:  1458710 blocks
```

7.3.9 Verifying Your Choices

The procedure displays a list of OpenVMS VAX and DECwindows support options that you have chosen and gives you the opportunity to change your mind before proceeding by displaying the following message:

```
    The following options will be provided:

        OpenVMS library
        OpenVMS optional
        OpenVMS Help Message
        OpenVMS Management Station Software -- PC files
        DECwindows base support
        DECwindows workstation support with:
            -  75 dots per inch video fonts
            - 100 dots per inch video fonts
        DECnet-Plus

    Space remaining on system disk:  1458710 blocks

* Is this correct? (Y/N) y
```

If you answer Yes to this prompt, the procedure restores the OpenVMS required save set (VMS072.B) and purges the page, swap, dump, and authorization files.

If you answer No to this prompt, you can respecify the OpenVMS VAX and DECwindows options that you want to install. The procedure restores the DECwindows components you have chosen during Phase 2. For example:

```
    During Phase 2 you will be required to provide input if:

        o Your OpenVMS kit is multivolume
        o You chose an alternate device
        o You chose DECwindows options


    Now copying over the OpenVMS and DECwindows V7.2 REQUIRED save set
%BACKUP-I-STARTVERIFY, starting verification pass

    Purging pagefile, swapfile, dump file, and authorization
    files back to one version.

    Entering old page, swap, dump, errlog, and authorization files
    in new directory tree.


    Setting the startup command file for the next phase of the upgrade.

    Renaming SYS$SYSDEVICE:[SYS0.SYSEXE]MODPARAMS.DAT to
             SYS$SYSDEVICE:[SYS0.SYSEXE]MODPARAMS.DAT_OLD
    Renaming SYS$SYSDEVICE:[SYS0.SYSEXE]MODPARAMS.DAT_NEW to
             SYS$SYSDEVICE:[SYS0.SYSEXE]MODPARAMS.DAT
    Renaming SYS$SYSDEVICE:[SYS0.SYSEXE]VAXVMSSYS.PAR_NEW to
             SYS$SYSDEVICE:[SYS0.SYSEXE]VAXVMSSYS.PAR
```

7.3.10 Shutting Down Your System

After several minutes, the upgrade procedure indicates that the system will shut down to reboot the partially upgraded OpenVMS VAX system and displays information about how to reboot the system:

```
    System shutting down to boot the new kernel system.
    (Please ignore any error messages during the SHUTDOWN procedure.)

    The distribution kit must remain on DKB200: and the system disk
    must remain on VXPCSI$DKB100: in order to proceed to the next phase
    of the upgrade.

    The sysgen parameters are set to boot any system. Do not
    change them during the reboot or the upgrade may fail
    to execute properly!

    Once the shutdown is complete, stop the system using the HALT
    button on the computer control panel, or the BREAK key on the
    console terminal if your system has no HALT button. Reboot the
    system with the following command, replacing "ddcu" with the
    name of the disk drive that contains the system disk.

        B/F0000000 ddcu

    The upgrade is set up to continue once the system reboots.

    If, for some reason, the kernel V7.2 system should fail to boot,
    you can boot into SYSBOOT by entering:

        B/F0000001 ddcu

* Press RETURN to shut down system:
```

Once you have read the information displayed on the screen, press Return to begin the shutdown.

7.3.11 Rebooting the System

If your system uses console media, it should automatically reboot from the SYSF directory when the shutdown is complete. If you have a MicroVAX or if your system does not reboot from SYSF, halt the system and boot from the [SYSF] directory. For most MicroVAX and VAXstation computers, use the BOOT command in the following format and substitute the device name of the system disk for *ddcu*:

```
>>> B/F0000000 ddcu
```

If the system fails to boot, you can boot into SYSBOOT by entering the following:

```
>>> B/F0000001 ddcu
```

For more information on booting your computer from the SYSF directory, refer to the upgrade and installation supplement for your VAX computer.

7.3.12 Verifying System Time

When the system reboots, it displays a message similar to the following:

```
      OpenVMS (TM) VAX Version V7.2 Major version id = 1 Minor version id = 0

    System time is: 13-NOV-1998 10:46:26.34

    Enter Yes to the next question to leave the system time unchanged
           (the system clock continues to run unaffected)

    Enter No to set a new system time

    Enter ? to redisplay the time

   * Is this correct? (Y/N/?)
```

Enter your response and press Return.

7.4 Upgrade Phase 2

At the beginning of Phase 2, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V7.2 Upgrade Procedure.

   Upgrade Phase 2         13-NOV-1998 10:46:31.86

************************************************************
%SYSTEM-W-TZGMT, your local timezone has defaulted to GMT
%SYSTEM-I-SETTZ, to set your local timezone use:

     $ @SYS$MANAGER:UTC$TIME_SETUP.COM

************************************************************
On MIN or UPGRADE system startup - CLUE is not run.
       .
       .
       .

      13-NOV-1998 10:53:26.27
```

You can ignore the time zone message. The UTC$TIME_SETUP.COM procedure runs during the final phase of the upgrade procedure.

During Phase 2, the upgrade procedure restores the rest of the library (C), optional (D), Help Message (E), and OpenVMS Management Station software (F) save sets and DECwindows support files if you elected to install them.

7.4.1 Mounting Additional Magnetic Tape and Tape Cartridge Volumes

If your distribution kit is contained on open reel magnetic tapes or TK50 CompacTape cartidges, you may be asked to mount the second volume of the kit. If you need to mount the second volume, your system will display a message similar to the following:

```
Please mount volume 2 of the OpenVMS kit on <device>
```

where: *<device>* is the magnetic tape or tape cartridge drive.

After you respond to the prompt, the system displays one of the following messages:

- For a 9-track open reel magnetic tape, the message is similar to the following:

  ```
  * Is the volume labeled OVMS VAX V7.2 BIN MT9 2/2 ready to be mounted?
  ```

- For a TK50 CompacTape cartridge, the message is similar to the following:

  ```
  * Is the volume labeled OVMS VAX V7.2 BIN TK50 2/2 ready to be mounted?
  ```

To respond to either message, do the following:

1. Unload the volume currently in the drive.
2. Select the volume with the label that matches the label specified in the prompt.
3. Load the volume and make the drive ready.
4. Answer YES to the question.

For information on which save sets are located on which tape volumes, refer to Section 1.3.2.

7.5 Upgrade Phase 3

At the beginning of Phase 3, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V7.2 Upgrade Procedure.

     Upgrade Phase 3                  13-NOV-1998 11:05:47.14
```

During Phase 3, the upgrade procedure does the following:

1. Merges the OpenVMS VAX distributed files that are commonly edited by system managers with new OpenVMS VAX files.
2. Merges all the miscellaneous user files in the old system directories into a new set of system directories, temporarily called SYSF.SYSEXE, SYSF.SYSMGR, SYSF.SYSLIB, and so on.
3. Removes the directory entries for page, swap, dump, and authorization files from the old directory tree.
4. Deletes all the remaining accounting data files, operator logs, and all files in the SYSERR directory.
5. Merges the old and new versions of the following files: HELP, DCLTABLES, IMAGELIB.OLB, and STARLET.OLB.
6. Moves all remaining files from the old directory tree [VMS$COMMON] to the new directory tree.
7. Deletes the old directory tree [VMS$COMMON].

7.6 Upgrade Phase 4

At the beginning of Phase 4, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V7.2 Upgrade Procedure.

     Upgrade Phase 4            13-NOV-1998 11:21:40.65
```

During Phase 4, the upgrade procedure does the following:

1. Corrects back pointers for system directories.
2. Shuts down the system.
3. Reboots the system, or requires that you manually reboot the system.

7.6.1 How to Proceed

If the procedure requires that you manually reboot the system from the original system root (usually SYS0), do the following:

1. If you are upgrading a VAX 8530, 8550, 8810, or 8820-N computer, do the following:

   a. Restore the original copies of DEFBOO and *ddd*GEN to boot from the original root directory.

   b. In the preupgrade procedure (Chapter 5), you made copies of the boot command procedures, DEFBOO.SAV and *ddd*GEN.SAV. To restore the original names to these files, enter the following commands and press Return after each one:

   ```
   >>> EXIT
   $ COPY DEFBOO.SAV DEFBOO.COM
   $ COPY dddGEN.SAV dddGEN.COM
   ```

2. For most MicroVAX and VAXstation computers, use the BOOT command in the following format and substitute the device name of the system disk for *ddcu*:

   ```
   >>> B ddcu
   ```

   If the system fails to boot, you can boot into SYSBOOT by entering the following:

   ```
   >>> B/1 ddcu
   ```

For more information about booting your system, refer to the upgrade and installation supplement for your VAX computer.

When the system reboots, the procedure displays a message similar to the following:

```
OpenVMS (TM) VAX Version V7.2 Major version id = 1 Minor version id = 0
```

After the system reboots, the procedure continues with upgrade Phase 5. Do not move the system disk to a different drive. The system disk must remain in the same drive for the procedure to continue with Phase 5.

7.7 Upgrade Phase 5

At the beginning of Phase 5, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V7.2 Upgrade Procedure.

     Upgrade Phase 5            13-NOV-1998 11:36:36.95
```

During Phase 5, the upgrade procedure does the following:

1. Deletes the temporary [SYSF] directory tree.
2. Cleans up files used only during the upgrade procedure.
3. Registers the OpenVMS VAX V7.2 operating system in the POLYCENTER Software Installation product database.
4. Installs DECnet Phase IV V7.2. Earlier in the procedure you were asked whether you wanted to install the DECnet Phase IV product. If you answered YES, the procedure now installs it.
5. Converts all VAXVMSSYS.PAR parameter files found in system roots to Version 7.2 format.
6. Displays messages listing tasks that you can perform after the upgrade procedure is completed. These tasks are described in Chapter 8.

7.8 Upgrade Phase 6

At the beginning of Phase 6, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V7.2 Upgrade Procedure.

     Upgrade Phase 6       13-NOV-1998 11:38:46.83

Configuring all devices on the system ...
```

7.8.1 Restoring System Files

The procedure restores SYS$SPECIFIC and SYS$COMMON versions of the following system files that were renamed with .COM_OLD_SPECIFIC and .DAT_OLD_SPECIFIC extensions during Phase 1:

SYSTARTUP_VMS.COM
SYCONFIG.COM
SYPAGSWPFILES.COM
SYSECURITY.COM
SYSHUTDWN.COM
SYLOGIN.COM
LOGIN.COM
SYLOGICALS.COM
AGEN$NEW_SATELLITE_DEFAULTS.DAT
AGEN$NEW_NODE_DEFAULTS.DAT
LAT$SYSTARTUP.COM
TFF$STARTUP.COM

You might not have site-specific versions of all of these files. The procedure displays a message listing each file as it is restored.

You might receive any of the following network messages, which can be ignored:

```
%NCP-W-UNRCMP, Unrecognized component, Object
```

Or:

```
%NCP-I-SUCCESS, Success
Object = X$X0
%NML-I-RECDELET, Database entry deleted
```

7.8.2 Updating Time Zone Information

At this point in the upgrade, the procedure checks for the presence of time zone and time differential factor (TDF) files on your system. If it does not find one or the other of these files, the procedure prompts you for information to be used for providing local time zone support.

For local time zone support to work correctly, the upgrade procedure must set the time zone that accurately describes the location you want to be considered as your default time zone. Usually, this is the time zone in which your system is running. In addition, your system must be correctly configured to use a valid OpenVMS time differential factor (TDF).

The procedure displays a series of time zone menus and prompts you to make selections from those menus. The first menu is the main time zone menu. Select the time zone that best describes your location. If you do not select a time zone, the default is Greenwich Mean Time (GMT).

Some time zone choices cause an additional menu to be displayed. This happens when the time zone you select has subcomponents. For example, if you choose the United States (US) time zone from the main menu, a second menu displays the specific time zones within the United States. You then select the menu item that best represents your local time zone.

The procedure then prompts you for the TDF. The TDF is the difference between your system time and Coordinated Universal Time (UTC), which is an international standard for measuring time of day. You can choose from the following options:

- Exit the time zone procedure without setting a TDF
- Set a TDF
- Display the TDF for your local time zone

For more information about TDF and local time zone support, refer to the *OpenVMS System Manager's Manual*.

7.8.3 Installing DECnet-Plus

Earlier in the procedure, you were asked whether you wanted to install the DECnet-Plus product. If you answered Yes, the procedure now installs it.

Note that if DECnet-Plus is already installed on your system and if the installed version is the same as or higher than the version supplied with OpenVMS VAX Version 7.2, then DECnet-Plus is *not* reinstalled, and the procedure displays the following message:

```
DECnet-Plus is already installed.
```

If DECnet-Plus is not already installed on your system, the procedure displays a message similar to the following and prompts you for information it needs to install the DECnet-Plus product:

```
    DECnet-Plus will now be installed.

    Media containing the DECnet-Plus kit must be available.

    If you are installing OpenVMS from an InfoServer (DAD1)
    or local CD-ROM, there is a DECnet-Plus kit on the CD-ROM.

    If you are installing from a cartridge tape (TK50) or
    from an open reel tape, you should have a DECnet-Plus kit
    on cartridge tape or open reel tape.

    An appropriate DECnet-Plus kit may also be available on
    the Consolidated Distribution CD-ROM, or you may have a
    separate DECnet-Plus kit.

    NOTE: You may choose any available media for the
    DECnet-Plus kit.  It is NOT NECESSARY to use the same
    type of media that contained the OpenVMS kit.

* Enter name of drive holding the DECnet-Plus kit: dkb200
* Is DKB200: ready to be mounted? [N] y

The following product has been selected:
    DEC VAXVMS DECNET_OSI V7.2               Layered Product


Configuration phase starting ...

You will be asked to choose options, if any, for each selected product and for
any products that may be installed to satisfy software dependency requirements.

DEC VAXVMS DECNET_OSI V7.2: DECnet-Plus V7.2 for OpenVMS VAX

    Copyright (c) Digital Equipment Corporation 1999. All rights reserved.

    Digital Equipment Corporation

    This product requires one of two PAKs: DVNETEND or DVNETRTG.

    Do you want the defaults for all options? [YES]

    Do you want to review the options? [NO] y

    VAXVMS DECNET_OSI V7.2: DECnet-Plus V7.2 for OpenVMS VAX
    DEC VAXVMS VMS V7.2 [Installed]
    VAX P.S.I. or P.S.I. Access software: NO
    VAX Wide Area Device Drivers: NO
    DECdns Server software: NO
    DECdts Server software: NO

Are you satisfied with these options? [YES]

Execution phase starting ...

The following product will be installed:
    DEC VAXVMS DECNET_OSI V7.2            Layered Product

Portion done: 0%...10%...20%...30%...40%...80%...90%...100%

The following product has been installed:
    DEC VAXVMS DECNET_OSI V7.2            Layered Product
```

7.8.4 Running AUTOGEN

Next, the procedure displays the following message and runs AUTOGEN:

```
Running AUTOGEN to compute the new SYSTEM parameters ...
```

If AUTOGEN encounters any problems, it displays the following message:

```
%AUTOGEN-W-REPORT, Warnings were detected by AUTOGEN. Please review the
        information given in the file SYS$SYSTEM:AGEN$PARAMS.REPORT.
```

If AUTOGEN displays this message, be sure to check AGEN$PARAMS.REPORT as one of your postupgrade tasks. This task is described in Section 8.4.

7.8.5 Shutting Down the System

After AUTOGEN finishes, the procedure displays a sequence of shutdown messages that begins like this:

```
The system is shutting down to allow the system to boot with the
generated site-specific parameters and installed images.

The system will automatically reboot after the shutdown and the
upgrade will be complete.

        SHUTDOWN -- Perform an Orderly System Shutdown
                    on node VXPCSI
   .
   .
   .
```

The system shuts down and will reboot automatically if your system is set up to do so. If the system does not reboot automatically, reboot it manually. For more information about booting your system, refer to the upgrade and installation supplement for your VAX computer.

7.8.6 Booting Voting Nodes

If you are upgrading a standalone system, go to the next step.

If you are upgrading a VAXcluster system, the system might hang when you try to reboot the upgraded system disk. This is because the total cluster value is less than the cluster quorum value. To remedy this situation, boot voting members that run from the system disk you just upgraded. (For more information about quorum values and voting members, refer to *OpenVMS Cluster Systems*.) All nodes that are booted at this time will run AUTOGEN and reboot.

7.8.7 Executing STARTUP

After the system reboots, the procedure displays the following message:

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

OpenVMS VAX V7.2

You have SUCCESSFULLY installed the OpenVMS VAX Operating System.

The system is now executing the STARTUP procedure. Please
wait for the completion of STARTUP before logging in to the
system.

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

Finally, the procedure displays informational messages as well as accounting information indicating that your OpenVMS VAX operating system is running. For example:

```
%STDRV-I-STARTUP, OpenVMS startup begun at 13-NOV-1998 13:36:40.32
   .
   .
   .
%SET-I-INTSET, login interactive limit=64, current interactive value = 0

 SYSTEM       job terminated at 13-NOV-1998 13:39:28.31

Accounting information:
 Buffered I/O count:       1845   Peak working set size:        970
 Direct I/O count:          677   Peak virtual size:           5165
 Page faults:              8906   Mounted volumes:                0
 Charged CPU time 0 00:00:53.34   Elapsed time        0 00:02:58.77
```

At this time, you can log in to the SYSTEM account (so you can perform postupgrade tasks), as described in the following sections.

7.8.8 Logging in to the SYSTEM Account by Means of a Character Cell Terminal

Log in to a character cell terminal by entering the user name SYSTEM followed by the password. The display is similar to the following:

```
     Welcome to OpenVMS VAX V7.2

Username: SYSTEM
Password:
     .
     .
     .
     Welcome to OpenVMS VAX Version V7.2
```

(If you forget your password, follow the instructions in the *OpenVMS System Manager's Manual: Essentials* to perform an emergency startup.)

7.8.9 Logging in to the SYSTEM Account by Means of a Workstation

If you installed the DECwindows Motif for OpenVMS VAX software on your workstation, do the following after the login window displays on your screen:

1. Enter the user name SYSTEM followed by the password.
2. Click on the OK button.

7.9 What to Do Next

After you have successfully upgraded the OpenVMS VAX operating system and logged in to the SYSTEM account, you must perform certain postupgrade tasks before you can use the system. For complete information, go to Chapter 8.

8

After Upgrading the OpenVMS VAX Operating System

After you upgrade the OpenVMS VAX operating system, you need to perform several important tasks before you can use the system. These tasks, described in the order in which you perform them, are as follows:

- Verifying system time
- Restoring the preferred node list
- Replacing SYSUAF.DAT and VMS$AUDIT_SERVER.DAT
- Examining AGEN$PARAMS.REPORT
- Checking the size of system files
- Examining your command procedures
- Changing MODPARAMS.DAT
- Updating your console media
- Decompressing system libraries
- Testing the system with UETP, the user environment test package
- Increasing free space on your system disk
- Purging system files
- Restoring your modifications to the system password dictionary
- Customizing DECwindows support software
- Preparing to run the OpenVMS Management Station software
- Installing layered products
- Backing up the system disk
- Running AUTOGEN
- Completing the postupgrade checklist

If you are an experienced system manager, you can use the checklist at the end of this chapter to complete the necessary postupgrade tasks.

If you are a less-experienced system manager, you should read the entire chapter and then use the checklist to make sure you have completed all the postupgrade tasks.

8.1 Verifying System Time

During the upgrade, the procedure displayed the system time and gave you the opportunity to enter the correct time if the displayed time was incorrect.

Now that you have upgraded your system, verify that the system time is correct by entering the following command:

```
$ SHOW TIME
```

The system displays the date and time.

If the time displayed by your system is not correct, reset it by entering the command SET TIME using the following format:

SET TIME=dd-mmm-yyyy:hh:mm:ss

For example:

```
$ SET TIME=13-NOV-1998:10:19:25
```

8.2 Restoring the Preferred Node List

After the upgrade completes, the queuing system on the upgraded nodes is enabled, and you must restore the preferred node list for the queue manager.

To restore the preferred node list, enter the following command from any node:

START/QUEUE/MANAGER/ON=(node1, node2 . . . node*n*)

For **node1**, **node2**, and so forth, supply the names of the nodes — separated by commas — that you want to restore to the preferred node list.

8.3 Replacing SYSUAF.DAT and VMS$AUDIT_SERVER.DAT

If you permanently store the SYSUAF.DAT and VMS$AUDIT_SERVER.DAT files on the system disk, go to Section 8.4.

If you do not permanently store SYSUAF.DAT and VMS$AUDIT_SERVER.DAT on the system disk, you copied them to the system disk before you did the upgrade. During the upgrade procedure, these files were updated.

Note

If you did a rolling upgrade, the shared version of SYSUAF.DAT was not updated.

To replace the updated files, copy the updated versions of SYSUAF.DAT and VMS$AUDIT_SERVER.DAT from the system disk to the directory where you usually keep them.

8.4 Examining AGEN$PARAMS.REPORT

When AUTOGEN runs, it writes informational and, if necessary, warning messages to the file SYS$SYSTEM:AGEN$PARAMS.REPORT. You can view the contents of this report file to examine these messages.

To display AGEN$PARAMS.REPORT on your screen, enter the following command and press Return:

```
$ TYPE SYS$SYSTEM:AGEN$PARAMS.REPORT
```

If the report includes a message similar to the following, you can modify the size of the page, swap, or dump file:

```
(******************
%AUTOGEN-W-DSKSPC, The disk on which DISK$OpenVMS072:[SYS0.SYSEXE]PAGEFILE.SYS
        resides would be over 95% full if it were modified to hold 20000
        blocks.
******************)
```

For more information about modifying the sizes of the page, swap, or dump files, see Section 8.5.

8.5 Checking the Size of System Files

AUTOGEN sets the following files at sizes appropriate for your system:

[SYSEXE]SYSDUMP.DMP
[SYSEXE]PAGEFILE.SYS
[SYSEXE]SWAPFILE.SYS

For special workloads or configurations, you can specify different sizes for these files. Check the sizes of these files to be sure they meet your needs. Log in to the SYSTEM account and enter the following command:

```
$ @SYS$UPDATE:SWAPFILES
```

For more information, refer to the *OpenVMS System Manager's Manual: Essentials*.

8.6 Examining Your Command Procedures

The upgrade procedure places a new version of WELCOME.TXT on your system disk. If your system uses a site-specific version of this file, you must modify the new version of the file with your changes.

The upgrade procedure restores your site-specific version of the following files with *.COM_OLD_SPECIFIC extensions:

SYSTARTUP_VMS.COM
SYCONFIG.COM
SYPAGSWPFILES.COM
SYSECURITY.COM
SYSHUTDWN.COM
SYLOGIN.COM
LOGIN.COM
SYLOGICALS.COM
LAT$SYSTARTUP.COM
TFF$STARTUP.COM

The upgrade procedure provides new templates for some of these files with the .TEMPLATE extension. The new templates can include features that are not in your site-specific files. Check the templates against your site-specific files and edit your files as necessary.

Remember, you do not need a START/QUEUE/MANAGER command in your startup file because the queue manager automatically starts up when you boot the system.

8.7 Changing MODPARAMS.DAT

Review the file SYS$SYSTEM:MODPARAMS.DAT. The upgrade procedure created a new version of this file. The old version is named SYS$SYSTEM:MODPARAMS.DAT_OLD. Modify the new file, if necessary, for your system.

If you are upgrading a VAXcluster, you must update the MODPARAMS.DAT file for each VAX computer that boots from the system disk. Make sure the value for the EXPECTED_VOTES parameter is correct. The value is the sum of all VOTES in the cluster. For example, if there are five VAX computers in the cluster, and each has one VOTE, the value is five. As you reboot each VAX computer, AUTOGEN runs automatically. The cluster forms when you have booted enough computers to attain cluster quorum.

For more information, refer to the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*.

8.8 Updating Your Console Media

If your computer does not use console media, skip this section and go to Section 8.10.

If your computer uses console media, you must copy the Version 7.2 VMB.EXE onto your system's console media. The procedure differs depending on the VAX series computer you have. Follow the instructions in the section that applies to your VAX computer.

8.9 VAX 8530, 8550, 8810 (8700), 8820-N (8800) Computers

If you upgraded a VAX 8530, 8550, 8810 (8700), or 8820-N (8800) computer, do the following:

1. Insert a blank RX50 diskette in one of the console diskette drives. The console refers to the upper (or left-hand) diskette drive as DZ1 while the OpenVMS VAX operating system refers to it as CSA1. The console refers to the lower (or right-hand) drive as DZ2 while the OpenVMS VAX operating system refers to it as CSA2.
2. Make sure the diskette drives are connected to the OpenVMS VAX operating system, as follows:

```
$ SHOW DEVICE CSA
Device                  Device           Error     Volume
 Name                   Status           Count      Label
CSA0:          (SYSTEM)  Online               0
CSA1:          (SYSTEM)  Online               0
CSA2:          (SYSTEM)  Online               0
```

   If the drives are not connected, the following message is displayed:

```
%SYSTEM-W-NOSUCHDEV, no such device available
```

   If this message is displayed, enter the following commands (you need CMKRNL privilege):

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE
SYSGEN> EXIT
```

3. To initialize the disk, enter a command in the following format:

```
$ INITIALIZE/STRUCTURE=1 device-name: volume-label
```

Substitute CSA1 or CSA2 for *device-name*. Substitute a 1- to 12-character name for *volume-label*. For example:

```
$ INITIALIZE/STRUCTURE=1 CSA1: V61CONSOLE
```

4. Enter the following commands to mount the diskette, create the required directories, and copy the new VMB.EXE to the diskette. Substitute CSA1 or CSA2 for *device-name*.

```
$ MOUNT/OVERRIDE=ID device-name:
$ CREATE/DIRECTORY device-name:[TRANSFER]
$ COPY SYS$SYSTEM:VMB.EXE device-name:[TRANSFER]
```

5. Once you have copied all the files, enter the following command to dismount the diskette. (Leave the diskette in the drive.) Substitute CSA1 or CSA2 for *device-name*.

```
$ DISMOUNT device-name:
```

6. To enter console mode, press Ctrl/P. To exit the console program, enter the following command:

```
>>> EXIT
```

7. Open the diskette drive door, pause for a moment, and close it. The red indicator light will flash.

8. To copy VMB.EXE from the diskette to the console fixed disk drive, enter the following command:

```
$ COPY DZu:[TRANSFER]VMB.EXE   LB0:[CONSOLE]
```

   Substitute DZ1 or DZ2 for DZu.

   The fixed drive in the console is known by two names, DW2 and LB0. Most console files are stored using the name LB0. If the system displays a message that describes a protection violation on the output device, copy the files using the device name DW2 rather than LB0.

9. When you have finished copying the files, remove the diskette from the drive.

10. Restart the console program by entering the following command and pressing Return:

```
$ RUN CONTROL
```

11. Return to the operating system by entering the following command and pressing Return:

```
>>> SET TERMINAL PROGRAM
```

8.9.1 VAX–11/730, 750, 780, 785 and VAX 8200, 8250, 8300, 8350, 8600, 8650 Computers

If you upgraded a VAX–11/730, 750, 780, 785 and VAX 8200, 8250, 8300, 8350, 8600, or 8650 computer, follow the instructions in this section.

The procedure does the following:

- Checks to see if you have enough space for the new VMB.EXE
- Copies the new VMB.EXE to the console media
- Updates the BOOT58 file for the VAX–11/750, 8200, 8250, 8300, and 8350 computers

To update the console media, use the following procedure:

1. Log in to the SYSTEM account.
2. Enter the following commands to check if there is enough space for the new VMB.EXE. You need 120 blocks. If you are updating a VAX–11/730 system, use CSA2 for *device-name*; if you are updating one of the other VAX computers, use CSA1 for *device-name*.

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE
SYSGEN> EXIT
$ EXCHANGE DIRECTORY device-name:VMB.EXE

Directory of RT-11 volume TINES$CSA1:      13-NOV-1998 18:40

  VMB.EXE      80   13-NOV-1998

Total of 1 file, 80 blocks.  Free space 43 blocks, largest 23.
```

   If the size of the current VMB, plus the free space, does not equal at least 120 blocks, delete unneeded files on the console until you have 120 blocks available. In the above example, the size of the current VMB.EXE (80 blocks) plus the free space (43 blocks) equals 123 blocks, so files do not have to be deleted.

3. Enter the following command and press Return:

```
$ @SYS$UPDATE:UPDATE_CONSOLE.COM
```

4. If you are updating the console media for a VAX 8600 or VAX 8650 computer, the new VMB.EXE is copied onto the console media.

   If you are updating the console media for one of the other VAX computers, the procedure uses the EXCHANGE procedure to copy the contents of the existing console media, merge the new files onto the copy of the console media, and create a new version of the console media. When the computer is ready to create the new version, it displays a message asking you to insert a scratch tape cassette or diskette. Take out the original console media and insert a new one.

8.9.2 VAX 9000 Computers

VAX 9000 computers use a special version of VMB.EXE named VMB9AQ.EXE. The upgrade procedure automatically copies a new version of this file to the console hard disk. However, if for some reason you need to update the console hard disk, use the UPDATE_CONSOLE.COM command procedure described for the VAX–11/730, 750, 780, 785 and VAX 8200, 8250, 8300, 8350, 8600, and 8650 computers. The device name for the VAX 9000 console hard disk is CSA1.

8.10 Decompressing the System Libraries

Decompressing the system libraries gives the system faster access to the libraries. You can decompress all the system libraries or just some of them. Table 8–1 gives the approximate number of blocks consumed by each library after decompression.

Table 8–1 Sizes of Decompressed System Libraries

Library	Blocks	Library	Blocks
HELPLIB.HLB	9108	EDFHLP.HLB	102
STARLET.OLB	8442	TPUHELP.HLB	1038
VAXCCURSE.OLB	102	ACLEDT.HLB	102
VAXCRTL.OLB	477	INSTALHLP.HLB	102
VAXCRTLG.OLB	102	LATCP$HELP.HLB	240
DECCCURSE.OLB	102	MNRHELP.HLB	102
DECCRTL.OLB	183	PATCHHELP.HLB	102
DECCRTLG.OLB	102	PHONEHELP.HLB	102
ERFLIB.TLB	105	SDA.HLB	111
STARLETSD.TLB	4800	SHWCLHELP.HLB	150
MAILHELP.HLB	273	SYSGEN.HLB	393
EDTHELP.HLB	231	TECO.HLB	102
DBG$UIHELP.HLB	408	UAFHELP.HLB	372
DBG$HELP.HLB	1986	EVE$HELP.HLB	1197
EXCHNGHLP.HLB	117	EVE$KEYHELP.HLB	147
NCPHELP.HLB	537	STARLET.MLB	2502
ANLRMSHLP.HLB	102	LIB.MLB	2229
DISKQUOTA.HLB	102		

The additional amount of disk space required to decompress all system libraries is about 13,500 blocks. To find out how much disk space you have, enter the following command and press Return:

```
$ SHOW DEVICE SYS$SYSDEVICE
```

8.10.1 How to Decompress Libraries

You execute the LIBDECOMP.COM command procedure to decompress the system libraries. To run LIBDECOMP, log in to the SYSTEM account, enter the following command, and press Return:

```
$ @SYS$UPDATE:LIBDECOMP.COM
```

The following information is displayed:

```
              OpenVMS Library Decompression Utility

 1  HELPLIB.HLB          14  NCPHELP.HLB          27  PHONEHELP.HLB
 2  STARLET.OLB          15  SDA.HLB              28  LIB.MLB
 3  ACLEDT.HLB           16  SHWCLHELP.HLB        29  STARLET.MLB
 4  ANLRMSHLP.HLB        17  SYSGEN.HLB           30  STARLETSD.TLB
 5  DBG$HELP.HLB         18  ANALAUDIT$HELP.HLB   31  SYS$STARLET_C.TLB
 6  DBG$UIHELP.HLB       19  SYSMANHELP.HLB       32  ERFLIB.TLB
 7  DISKQUOTA.HLB        20  TFF$TFUHELP.HLB      33  SYS$LIB_C.TLB
 8  EDFHLP.HLB           21  EXCHNGHLP.HLB        34  VAXCCURSE.OLB
 9  INSTALHLP.HLB        22  TPUHELP.HLB          35  VAXCRTL.OLB
10  LATCP$HELP.HLB       23  EVE$HELP.HLB         36  VAXCRTLD.OLB
11  MAILHELP.HLB         24  EVE$KEYHELP.HLB      37  VAXCRTLT.OLB
12  MNRHELP.HLB          25  UAFHELP.HLB          38  IMAGELIB.OLB
13  EDTHELP.HLB          26  TECO.HLB

     39  VMS$VOLATILE_PRIVATE_INTERFACES.OLB

      A  ALL libraries to be decompressed
      E  EXIT this procedure
```

```
* Enter letter or number(s) of libraries to be decompressed
  (Separate multiple entries with a comma):
```

Enter the appropriate letter or the numbers of the libraries you want to decompress. To decompress all libraries, the process takes approximately one half hour.

If you prefer, you can execute LIBDECOMP interactively or as a batch job. If you use either of these methods, you can decompress up to 8 libraries each time you execute LIBDECOMP by listing the names of the libraries you want to decompress as parameters on the command line. (You can decompress all the libraries by omitting the /PARAMETERS qualifier.) Be sure to separate the library names with commas and do not include the file extension. For example, to decompress the VAXCRTL.OLB, DISKQUOTA.HLB, and LIB.MLB libraries as a batch job, enter the following command:

```
$ SUBMIT/NOTIFY/PARAMETERS=(VAXCRTL, DISKQUOTA, LIB)-
_$ SYS$UPDATE:LIBDECOMP
```

To decompress these same libraries interactively, enter the following command:

```
$ @SYS$UPDATE:LIBDECOMP VAXCRTL DISKQUOTA LIB
```

Note that, when you type the command for a batch job, you separate the library names with commas and enclose the list within parentheses. You do not use commas or parentheses on the interactive command line.

8.11 Testing the System with UETP

UETP, the user environment test package, is a software package that tests whether the OpenVMS VAX operating system is installed correctly. As part of the postupgrade procedure, you should run UETP to verify your upgrade.

Note that UETP needs at least 1200 free blocks on the system disk and is available only if you installed the optional save set VMS072.D. If you did not install the optional save set, you can add the UETP files to your system using VMSTAILOR. For information about using VMSTAILOR, see Chapter 10.

For complete information about UETP, refer to the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*.

8.12 Increasing Free Space on the System Disk

This section describes how to increase the amount of free space on your system disk. You can gain free space by removing optional OpenVMS VAX files that you do not need from the system disk or by purging old versions of some system files.

8.12.1 Running the ANALYZE /DISK_STRUCTURE Utility

Certain disk structure inconsistencies may be introduced during the OpenVMS VAX upgrade operation. To check for these inconsistencies, enter the following command:

```
$ ANALYZE /DISK_STRUCTURE SYS$SYSDEVICE:
```

This command produces output in the following format:

```
Error opening QUOTA.SYS
No such file
File (2849,7,1) DCLTABLES.EXE;31
        marked for delete
File (4270,3,1) SYS.EXE;2
        marked for delete
File (5485,9,1) SYS$NETWORK_SERVICES.EXE;1
        marked for delete
```

If quotas are not in use on the system disk, ignore the "No such file" message for QUOTA.SYS. Most inconsistencies (including "marked for delete") can be repaired by entering the following command:

```
$ ANALYZE /DISK_STRUCTURE /REPAIR SYS$SYSDEVICE:
```

8.12.2 Using VMSTAILOR and DECW$TAILOR

To remove files you do not need from the system disk, use VMSTAILOR. For example, if you are not running DECnet for OpenVMS, you do not need the network support files. For complete information about using VMSTAILOR to remove files, see Chapter 10.

If you are running DECwindows Motif, use DECW$TAILOR to add or remove DECwindows base support, workstation support, and fonts.

Note

Files installed on alternate devices cannot be tailored.

8.12.3 Purging System Files

In most cases, you can purge the following OpenVMS system files to free space on your system disk. However, before you purge any of these files, read Appendix F to make sure you do not purge a file version you might want to keep.

```
SYS$SYSTEM:SHUTDOWN.COM
SYS$SYSTEM:STARTUP.COM
SYS$LIBRARY:ENCRYPSHR.EXE
SYS$LIBRARY:*RTL*.EXE
SYS$LIBRARY:*SHR.EXE
SYS$MANAGER:EDTINI.EDT
SYS$MANAGER:DBLSTRTUP.COM
SYS$MANAGER:*.TEMPLATE
SYS$EXAMPLES:XADRIVER.MAR
SYS$LIBRARY:CDDSHR.EXE
SYS$LIBRARY:EPC$FACILITY.TLB
SYS$MESSAGE:EPC$MSG.EXE
SYS$STARTUP:VMS$LAYERED.DAT
```

To purge a file, enter the PURGE command followed by the file specification. For example:

```
$ PURGE SYS$SYSTEM:SHUTDOWN.COM
```

8.13 Restoring Your System Password Dictionary

The OpenVMS VAX operating system screens potential passwords for acceptability. The DCL command SET PASSWORD takes the user's proposed password, converts it to lowercase (if necessary), and compares it to entries in a system dictionary. If the proposed password is found in the dictionary, it is rejected as a valid user password, and the user must suggest another. Many system managers modify the system password dictionary to include words of significance to their site.

During the upgrade, the procedure replaces the existing system password dictionary with a new one. If you had modified the dictionary and want to restore your local additions, you must merge the file containing your additions with the new system file.

To add your site-specific passwords to the new system password dictionary, enable SYSPRV and merge your local additions by entering the following commands, where LOCAL_PASSWORD_DICTIONARY.DATA is the file that contains your additions:

```
$ SET PROCESS/PRIVILEGE=SYSPRV
$ CONVERT/MERGE/PAD LOCAL_PASSWORD_DICTIONARY.DATA -
_$ SYS$LIBRARY:VMS$PASSWORD_DICTIONARY.DATA
```

8.14 Customizing DECwindows Support Software

If you have installed DECwindows support software, there are several steps that you can take to customize the DECwindows environment. Depending on your configuration, DECwindows customization tasks include the following:

- Customizing the server startup
- Using the Transmission Control Protocol/Internet Protocol (TCP/IP) as a DECwindows transport
- Using transports for DECwindows other than those supplied by Compaq

Go to Chapter 9 for complete instructions for customizing your DECwindows support software.

After you complete the tasks described in Chapter 9, return to this chapter to continue with the remaining postupgrade tasks.

8.15 Preparing to Use the OpenVMS Management Station

The OpenVMS Management Station client/server software provides OpenVMS system management capabilities through a client application on a personal computer (PC) running Microsoft Windows.

When you upgraded your OpenVMS system, the OpenVMS Management Station server files were automatically installed on your OpenVMS system disk. However, to obtain *complete* support, you had to select the OpenVMS Management Station client software files during the OpenVMS upgrade procedure. Those files are required for creating the installation media that you use to install the client software on your PC.

Appendix G provides complete instructions for preparing your OpenVMS system and your PC to run the OpenVMS Management Station software.

Note

If you did *not* select the optional OpenVMS Management Station client software files during the installation or upgrade, you must add these files to your OpenVMS system disk before you follow the instructions in Appendix G. Use the OpenVMS Version 7.2 distribution media and VMSTAILOR to add the OpenVMS Management Station files to your system. (For information about using VMSTAILOR, see Chapter 10.)

8.16 Installing Layered Products

Back up your system disk and then use either the VMSINSTAL command procedure or the POLYCENTER Software Installation utility to install layered products on your system. If the system contained DIGITAL TCP/IP Services previous to the upgrade, you must reinstall it now.

For additional information about installing layered products, see the *OpenVMS System Manager's Manual*.

8.17 Backing Up the System Disk

Compaq recommends that you protect your work by performing the following operations:

- Use SYS$UPDATE:CONSCOPY.COM to back up the console media (if applicable).
- Make a standalone BACKUP kit on removable media and on the system disk.

  If your console media is a TU58 tape cartridge or an RX01 diskette, use the standalone BACKUP copy you made before you began the upgrade. (See Section 5.4.2.)
- Back up the system disk.

For complete information about these operations, refer to the upgrade and installation supplement for your VAX computer.

8.18 Running AUTOGEN

When you upgraded the OpenVMS VAX operating system, the procedure executed AUTOGEN to set the values of system parameters and the sizes of the page and swap files according to the system's workload.

In many cases, AUTOGEN can improve system performance by using dynamic feedback information from the running system. As a postinstallation task, you should run AUTOGEN again using the feedback mechanism to make further adjustments to system parameters.

When AUTOGEN runs after an upgrade, it uses the parameter values in SYS$SYSTEM:MODPARAMS.DAT. Note that hardcoded values in MODPARAMS.DAT affect AUTOGEN's calculations of the feedback parameters. For AUTOGEN to properly calculate minimum values, you should replace the hardcoded values in MODPARAMS.DAT with MIN_ values. The MIN_ prefix specifies the minimum value to which a parameter can be set by AUTOGEN.

8.18 Running AUTOGEN

If you are not satisfied with the parameter settings calculated by AUTOGEN, you can modify the parameter values by editing MODPARAMS.DAT as explained in the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*.

After you have upgraded the operating system, run AUTOGEN again using the following procedure:

1. After 24 hours of operation, run AUTOGEN in feedback mode and reboot the system.
2. Run AUTOGEN in this same way, again, two working days later.

Note

For the VAX 9000 computer, AUTOGEN's initial parameter calculations are conservative. To obtain parameter values that match your system workload, you can run AUTOGEN in feedback mode a number of times. For more information, refer to the upgrade and installation supplement for your VAX 9000 computer.

3. Compaq recommends that you run AUTOGEN from SAVPARAMS through TESTFILES on a weekly basis and examine AGEN$PARAMS.REPORT to determine the need for additional changes.

For information about using AUTOGEN, refer to the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*.

8.19 Postupgrade Checklist

Use the following checklist to make sure you perform all the necessary postupgrade tasks.

- ☐ Verify the system time. (Described in Section 8.1)
- ☐ Restore the preferred node list for the queue manager. (Described in Section 8.2)
- ☐ Replace SYSUAF.DAT and VMS$AUDIT_SERVER.DAT. (Described in Section 8.3)
- ☐ Examine AUTOGEN output stored in the file AGEN$PARAMS.REPORT. (Described in Section 8.4)
- ☐ Examine the command procedure templates supplied with OpenVMS VAX Version 7.2. (Described in Section 8.6)
- ☐ Examine MODPARAMS.DAT? (Described in Section 8.7)
- ☐ Update your console media. (Described in Section 8.8)
- ☐ Decompress the system libraries using LIBDECOMP.COM. (Described in Section 8.10)
- ☐ Run UETP (the user environment test package) to test the system. (Described in *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*)
- ☐ Remove unwanted files and check the sizes of system files. (Described in Section 8.12)

After Upgrading the OpenVMS VAX Operating System 8.19 Postupgrade Checklist

- ☐ Restore your local additions to the system password dictionary. (Described in Section 8.13)
- ☐ Customize your DECwindows environment. (Described in Section 8.14)
- ☐ Build a standalone BACKUP kit. (Described in Section 8.17)
- ☐ Back up the console media. (Described in Section 8.17)
- ☐ Install layered products. (Described in Section 8.16)
- ☐ Back up the system disk. (Described in the upgrade and installation supplement for your computer)
- ☐ Run AUTOGEN and reboot the system after the first 24 hours of operation. (Described in Section 8.18)

9
Customizing DECwindows Support Software

This chapter describes how you can customize DECwindows support software. The DECwindows components provided on the OpenVMS VAX kit supply DECwindows base support and workstation support files only. If you have not installed either of these DECwindows components on your system, skip this chapter.

Depending on your configuration, DECwindows customization tasks include the following:

- Customizing the server startup
- Using the Transmission Control Protocol/Internet Protocol (TCP/IP) as a DECwindows transport
- Using transports with DECwindows other than those supplied by Compaq

Note that the OpenVMS VAX operating system no longer includes the VMS DECwindows product. To get full DECwindows support, you must also install the separate DECwindows Motif for OpenVMS VAX layered product, which supports both the Motif and XUI environments.

9.1 Customizing the Server Startup

By default, the DECwindows server no longer logs successful connect/disconnect messages to the DECW$SERVER_#_ERROR.LOG file. To enable these messages, define the symbol DECW$SERVER_CONNECT_LOG in the DECW$PRIVATE_SERVER_SETUP.COM file to be "T" and restart the server. Note that abnormal or unsuccessful connect/disconnect messages are still logged by the server.

9.1.1 Assumptions

The startup command procedures automatically determine most of the configuration variables for the DECwindows display server. However, there are items that the command procedures cannot determine, so they make the following assumptions:

- The startup procedures normally assume that you have a 75 dots/inch monitor (such as a VR260 or VR290). However, if you are installing on a VAXstation 4000, the startup procedures assume that you have a 100 dots/inch monitor.
- If you have a GPX, SPX, or LCG workstation, the startup procedures assume that you have a color monitor.
- The startup procedures normally assume that you have a North American keyboard layout (you have an LK201–AA or an LK201–LA keyboard). If you are installing on a VAXstation 4000, the startup procedures assume that you have an LK401–AA keyboard.
- The startup procedures assume that the server will use only DECnet software and local transports.

9.1.2 How to Override Incorrect Assumptions

If any of these assumptions is incorrect, you must override them as follows:

1. Make a copy of the file SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.TEMPLATE and rename it to a .COM file type. The comments in this file show how to customize individual workstations by adding a section of DCL commands for each workstation. You can also add DCL commands to the common section of the server startup file. By doing this, you ensure that the customizations you make affect all workstations that use the server startup file.

2. If your screen supports 100 dots/inch, add the following line:

   ```
   $ DECW$SERVER_DENSITY == "100"
   ```

   Add this line to the section for each workstation that has a 100 dots/inch monitor, or add it to the common section for all workstations (if all the workstations have 100 dots/inch monitors).

3. If you have upgraded to a VAXstation 4000 but still have a 75 dots/inch monitor, add the following line:

   ```
   $ DECW$SERVER_DENSITY == "75"
   ```

4. The section for any workstation with color graphics and a monochrome screen should contain the following lines:

   ```
   $ DECW$COLOR == "FALSE"
   $ DECW$BITONAL == "FALSE"
   ```

5. To override the default keyboard layout, determine the correct name from the model number of your LK201 keyboard, as follows:

   a. Turn the keyboard upside down, and look for a label that specifies the model number. The model number should be in a format similar to LK201-xx.

      If the model number is listed as LK201 without any additional characters, the information you need is on another part of the label. Look for a number that has the following format:

      ```
      nn-nnnnn-xx.
      ```

   b. Use the *xx* part of this number to choose a keymap name from Table 9–1. The table is arranged based on the dialect that each keyboard is designed for. Choose the keymap ending in _DP for the data processing keyboard layout, or the keymap ending in _TW for the typewriter layout.

Table 9–1 DECwindows Keymap

Dialect	Model	DECwindows Keymap Name
Austrian/German	LK201-(AG,LG,BG,MG)	AUSTRIAN_GERMAN_LK201LG_DP
		AUSTRIAN_GERMAN_LK201LG_TW
	LK201-(NG,PG)	AUSTRIAN_GERMAN_LK201NG_DP
		AUSTRIAN_GERMAN_LK201NG_TW
	LK401-(AG)	AUSTRIAN_GERMAN_LK401AG_TW
Belgian/French	LK201-(AP,LP,BP,MP)	BELGIAN_FRENCH_LK201LP_DP
		BELGIAN_FRENCH_LK201LP_TW
Belgian/French	LK401-(AP)	BELGIAN_FRENCH_LK401AP_DP
		BELGIAN_FRENCH_LK401AP_TW
British	LK201-(AE,LE,BE,ME)	BRITISH_LK201LE_DP
		BRITISH_LK201LE_TW
British	LK401-(AA,PA)	BRITISH_LK401AA_DP
		BRITISH_LK401AA_TW
Canadian/French	LK201-(AC,LC,BC,MC)	CANADIAN_FRENCH_LK201LC_DP
		CANADIAN_FRENCH_LK201LC_TW
Canadian/French	LK401-(AC,LC,BC,MC)	CANADIAN_FRENCH_LK401AC_DP
		CANADIAN_FRENCH_LK401AC_TW
Czech	LK401-(BV)	CZECH_LK401AV
Danish	LK201-(AD,LD,BD,MD)	DANISH_LK201LD_DP
		DANISH_LK201LD_TW
	LK201-(ED,RD,FD)	DANISH_LK201RD_DP
		DANISH_LK201RD_TW
Danish	LK401-(AD,LD,BD,MD)	DANISH_LK401AD_DP
		DANISH_LK401AD_TW
Dutch	LK201-(AH,LH,BH,MH)	DUTCH_LK201LH_DP
		DUTCH_LK201LH_TW
	LK201-(NH,PH)	DUTCH_LK201NH
	LK401-(NH,PH)	DUTCH_LK401AH
Finnish	LK201-(AF,LF,BF,MF)	FINNISH_LK201LF_DP
		FINNISH_LK201LF_TW
	LK201-(NX,PX)	FINNISH_LK201NX_DP
		FINNISH_LK201NX_TW
Finnish	LK401-(AF,LF,BF,MF)	FINNISH_LK401AF_DP
		FINNISH_LK401AF_TW
Flemish	LK201-(AB,LB,BB,MB)	FLEMISH_LK201LB_DP
		FLEMISH_LK201LB_TW
Flemish	LK401-(AB,LB,BB,MB)	FLEMISH_LK401AB_DP
		FLEMISH_LK401AB_TW

(continued on next page)

Table 9–1 (Cont.) DECwindows Keymap

Dialect	Model	DECwindows Keymap Name
Hungarian	LK401-(BQ)	HUNGARIAN_LK401_BQ
Icelandic	LK201-(AU,LU,BU,MU)	ICELANDIC_LK201LU_DP
		ICELANDIC_LK201LU_TW
Italian	LK201-(AI,LI,BI,MI)	ITALIAN_LK201LI_DP
		ITALIAN_LK201LI_TW
Italian	LK401-(AI,LI,BI,MI)	ITALIAN_LK401AI_DP
		ITALIAN_LK401AI_TW
North American	LK201-(AA,LA,BA,MA)	NORTH_AMERICAN_LK201LA
North American	LK401-(AA,LA,BA,MA)	NORTH_AMERICAN_LK401AA
Norwegian	LK201-(AN,LN,BN,MN)	NORWEGIAN_LK201LN_DP
		NORWEGIAN_LK201LN_TW
	LK201-(EN,RN,FN)	NORWEGIAN_LK201RN_DP
		NORWEGIAN_LK201RN_TW
Norwegian	LK401-(AN,LN,BN,MN)	NORWEGIAN_LK401AN_DP
		NORWEGIAN_LK401AN_TW
Polish	LK401-(BP)	POLISH_LK401_BP
Portuguese	LK201-(AV,LV,BV,MV)	PORTUGUESE_LK201LV
Portuguese	LK401-(AV,LV,BV,MV)	PORTUGUESE_LK401AV
Russian	LK401-(BT)	RUSSIAN_LK401_BT
Slovakian	LK401-(CZ)	SLOVAK_LK401_CZ
Spanish	LK201-(AS,LS,BS,MS)	SPANISH_LK201LS_DP
		SPANISH_LK201LS_TW
Spanish	LK401-(AS,LS,BS,MS)	SPANISH_LK401AS_DP
		SPANISH_LK401AS_TW
Swedish	LK201-(AM,LM,BM,MM)	SWEDISH_LK201LM_DP
		SWEDISH_LK201LM_TW
	LK201-(NM,PM)	SWEDISH_LK201NM_DP
		SWEDISH_LK201NM_TW
Swedish	LK401-(AM,LM,BM,MM)	SWEDISH_LK401AM_DP
		SWEDISH_LK401AM_TW
Swiss/French	LK201-(AK,LK,BK,MK)	SWISS_FRENCH_LK201LK_DP
		SWISS_FRENCH_LK201LK_TW
Swiss/French	LK401-(AK,LK,BK,MK)	SWISS_FRENCH_LK401AK_DP
		SWISS_FRENCH_LK401AK_TW
Swiss/German	LK201-(AL,LL,BL,ML)	SWISS_GERMAN_LK201LL_DP
		SWISS_GERMAN_LK201LL_TW
Swiss/German	LK401-(AL,LL,BL,ML)	SWISS_GERMAN_LK401AL_DP
		SWISS_GERMAN_LK401AL_TW

(continued on next page)

Table 9–1 (Cont.) DECwindows Keymap

Dialect	Model	DECwindows Keymap Name
Combined US/UK	LK201-(EE,RE,PE)	UK_LK201RE
		US_LK201RE
Combined US/UK	LK401-(EE,RE,PE)	UK_LK401AA
		US_LK401AA

c. After you choose a keymap name, modify the server startup file. For example, to change the keyboard layout to a Dutch typewriter layout, add the following line to the server startup file:

```
$ DECW$DEFAULT_KEYBOARD_MAP == "DUTCH_LK201LH_TW"
```

Add a line similar to this for each workstation that does not have a North American keyboard layout, or add it to the common section for all workstations (if all the workstations use the same keyboard layout).

6. To add support for the Transmission Control Protocol/Internet Protocol (TCP/IP) transport using the DIGITAL TCP/IP Services for OpenVMS product, add the following line:

```
$ DECW$SERVER_TRANSPORTS == "DECNET,LOCAL,TCPIP"
```

Add this line to the section for each workstation that will be using TCP/IP, or add it to the common section for all workstations.

To include support for other transports, add the last part of the transport image name to the list of transports. For example, suppose you want to add support for a customer-written transport that has the following image name:

SYS$SHARE:DECW_TRANSPORT_FOO

You would add the following line:

```
$ DECW$SERVER_TRANSPORTS == "DECNET,LOCAL,FOO"
```

7. Reboot the workstations for which you customized the server startup.
8. Customize security as described in the *Using DECwindows Motif for OpenVMS* manual.

After you start the server, a per-server logical name table is created on your system but is not added to the default logical name table search lists.

9.2 Using DIGITAL TCP/IP Services for OpenVMS

DECwindows contains support for the TCP/IP transport. This support requires DIGITAL TCP/IP Services for OpenVMS, a Compaq layered product. Before you can use the DECwindows TCP/IP transport interface, you must install DIGITAL TCP/IP Services for OpenVMS.

Note

Other vendors' implementation of TCP/IP transports use different call interfaces. For this reason, DECwindows support for TCP/IP is compatible only with DIGITAL TCP/IP Services for OpenVMS.

You can conserve memory and process slots by configuring DIGITAL TCP/IP Services for OpenVMS software for the minimum DECwindows requirement to support the X protocol. DECwindows only requires that INET_ACP be running. DECwindows does not require that the NFS server, the FTPD server, or the remote terminal servers be running.

For more information about TCP/IP concepts, refer to the *DIGITAL TCP/IP Services for OpenVMS Management* manual. For information about how to configure the TCP/IP software, refer to the *DIGITAL TCP/IP Services for OpenVMS Installation and Configuration* manual.

Documentation for DIGITAL TCP/IP Services for OpenVMS is included on the OpenVMS Online Documentation CD–ROM. Hardcopy documentation must be purchased separately.

9.3 Using Other Transports with DECwindows

DECwindows supports DECnet–Plus, local, and TCP/IP transports. However, you can use other transports, such as new transports for layered products and transports from third-party vendors, with DECwindows by writing a DECwindows transport interface layer.

9.3.1 Writing a Transport Interface

For information about writing a transport interface, refer to the *VMS DECwindows Transport Manual*.

The transport interface image's file name must have the following format where *name* is the unique transport name:

DECW$TRANSPORT_name (for transports supplied by Compaq)
DECW_TRANSPORT_name (for customer-written transports)

9.3.2 Installing the Transport Interface Image

Install the image as a protected image in the SYS$SHARE directory (as defined by an executive mode logical name). Compaq recommends that you install the image by adding the following line to SYS$MANAGER:SYSTARTUP_VMS.COM:

```
$ INSTALL CREATE SYS$SHARE:DECW_TRANSPORT_name/OPEN/SHARED-
/HEADER_RESIDENT/PROTECTED
```

You can also include this command in a startup file that SYSTARTUP_VMS calls.

To use this transport with the DECwindows server, customize the server startup as described in Section 9.1.

9.4 Using the Example Transport

DECwindows has an example transport interface based on the DIGITAL TCP/IP Services for OpenVMS layered product. It is similar to the DECwindows TCP/IP transport interface, except it includes its own source files and it uses a different port number (5000). You can run the example transport interface simultaneously with the TCP/IP transport interface.

If you have installed DIGITAL TCP/IP Services for OpenVMS software, you can install and use the example transport by doing the following:

1. Copy the example transport to the SYS$SHARE directory as follows:

   ```
   $ COPY DECW$EXAMPLES:DECW$TRANSPORT_EXAMPLE.EXE SYS$SHARE:/PROT=W:RE
   ```

2. Add the following line to SYS$MANAGER:SYSTARTUP_VMS.COM:

```
$ INSTALL CREATE SYS$SHARE:DECW$TRANSPORT_EXAMPLE /OPEN /SHARED-
/HEADER_RESIDENT /PROTECTED
```

3. Customize the private server startup as described in Section 9.1 for TCP/IP, except use the transport name ''EXAMPLE''. For example, you might add the following line:

```
$ DECW$SERVER_TRANSPORTS == "DECNET,LOCAL,TCPIP,EXAMPLE"
```

4. Reboot the workstation, or restart DECwindows.

5. Customize TCP/IP security as described in the *Using DECwindows Motif for OpenVMS* manual, but use the transport name ''EXAMPLE'' instead of ''TCPIP''.

6. Create a DECterm window on the workstation and enter the following command:

```
$ SET DISPLAY /CREATE /NODE=your_node /TRANSPORT=EXAMPLE
```

   Substitute the node name of your workstation for *your_node*.

   Remember that the same transport must be running on both the client and server. It is not necessary, however, for the client and the server to be on the same system.

7. Run any DECwindows application from the DECterm window. It now uses the example transport to display graphics on your workstation screen. For example, enter the following command to run the clock:

```
$ RUN SYS$SYSTEM:DECW$CLOCK
```

10
Using VMSTAILOR and DECW$TAILOR

This chapter describes how to add (tailor on) or remove (tailor off) optional OpenVMS VAX files and DECwindows support files from your system disk using VMSTAILOR and DECW$TAILOR. You will need your OpenVMS VAX software media kit to tailor on files. Any site-specific customization that has been done to a class will be lost when that class is tailored off.

10.1 Using VMSTAILOR

To add or remove unwanted OpenVMS VAX files from the system disk, use VMSTAILOR. For example, if you are not running DECnet for OpenVMS, and you do not need the network support files, you can remove those files using VMSTAILOR. If you later decide you want to run DECnet for OpenVMS, you can add the necessary files at any time using VMSTAILOR and your OpenVMS VAX distribution media. (Note that you cannot tailor files on or off an alternate device.)

10.1.1 How VMSTAILOR Works

VMSTAILOR has three phases:

1. VMSTAILOR asks if you want to tailor your system by adding files (tailor on) or by deleting files (tailor off).
2. If you choose to tailor files on, VMSTAILOR lists each class of OpenVMS VAX files and asks if you want to include them on the system disk. If you choose to tailor files off, VMSTAILOR lists each class of files and asks if you want to delete them from the system disk.
3. VMSTAILOR adds or deletes the files you indicated from the system disk. If you are tailoring files on, you must load your OpenVMS VAX distribution media in a drive available to the system. If your distribution media consists of more than one piece, put the first piece of the media into the drive.

The following is a list of classes and subclasses of OpenVMS VAX files that can be added or deleted by using VMSTAILOR. For a complete list of OpenVMS VAX files and their functions, refer to the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*.

- Network Support

  Incoming Remote File Access files
  Incoming Remote Terminal files
  Network Test files
  Remote Task Loading

- Programming Support

  Debugger utility (DEBUG)
  Image Dump utility (ANALYZE/PROCESS_DUMP)
  RMS Analyze and FDL Editor utilities (ANALYZE/RMS, ANALYZE/FDL)

Message utility (MESSAGE)
Object and Shareable Image libraries
MACRO libraries
MACRO assembler
SDL intermediary form of STARLET.MLB
Fortran required files
VAX C object libraries

- OpenVMS RMS Journaling Files
- System Programming Support

  Files–11 ODS-1,ISO 9660, High Sierra ACPs
  Monitor utility
  Delta/XDelta debugger
  System Dump Analyzer utility (ANALYZE/SYSTEM, ANALYZE/CRASH)
  System Symbol Table file (SYS.STB)
  Miscellaneous Symbol Table files

- Secure User's Environment

  File Access Control List utilities
  Print and Batch Queue utilities
  Input Queue Symbiont (Card Reader)
  Accounting Log Report Generator utility
  DECdtm

- Utilities

  Mail utility
  DUMP utility
  RUNOFF utility
  Phone utility
  OpenVMS Help library
  OpenVMS System Messages Help Library
  Foreign Terminal Support
  LAT-11 terminal server (via Ethernet)
  Standalone BACKUP
  Error Log Report Generator utility (ANALYZE/ERROR)
  DECTPU utility
  Terminal Fallback facility
  TECO editor
  EDT documentation
  National Character Set utility (NCS)

- VMS Workstation Support (VWS)

  Workstation device support

- BLISS require files
- Miscellaneous Files

  System map
  LPA-11 support

- User Environment Test Package
- Example Files

10.1.2 Removing OpenVMS VAX Files

To remove unwanted files using VMSTAILOR, perform the following steps:

1. Log in to the SYSTEM account.
2. Enter the following command and press Return:

   ```
   $ RUN SYS$UPDATE:VMSTAILOR
   ```

   VMSTAILOR displays a description of the VMSTAILOR program and the following message:

   ```
   Do you want to tailor files "ON" or "OFF"?
   ```

3. Enter OFF to remove unwanted files and press Return.

   The VMSTAILOR program lists each group, or *class*, of files and its size in blocks. Files are grouped according to their function. For example, all the files required for network support are in one class. A file class is made up of many smaller groups called *subclasses*. You can eliminate an entire class of files, or you can eliminate one or more of its subclasses. For example:

   ```
   CLASS - Network support
             Size of entire class (with subclasses): 1499
             Size of common files required for any subclass: 1249
             Do you wish to select the entire class (default = NO)?
      .
      .
      .
   ```

4. Decide which file classes or subclasses you do not need to support your system. The VMSTAILOR program displays step-by-step instructions. Follow these instructions to specify which classes or subclasses of files you want to remove.
5. VMSTAILOR deletes the files you selected and displays the names of those files. After it finishes, AUTOGEN runs automatically to make the adjustments that are necessary after system files are deleted. AUTOGEN also reboots the system.

Caution

To cancel VMSTAILOR during the first and second phases, press Ctrl/C, Ctrl/Y, or Ctrl/Z. Canceling VMSTAILOR during the third phase can cause a partially tailored disk.

For a description of each phase, see Section 10.1.1.

10.1.3 Adding OpenVMS VAX Files

To add optional OpenVMS VAX files that you previously removed, or that you chose not to install during the OpenVMS VAX installation procedure, do the following:

1. Log in to the SYSTEM account.
2. Load your distribution media in a drive available to the system. For example, if your distribution media is on a TK50 tape cartridge, load the first tape cartridge in a TK50 drive that is available to the system. Make sure the drive is on line and ready.

If you are adding files from a compact disc on an InfoServer, first determine whether the SYSGEN parameter SCSNODE is defined on your system (see Section 5.5) or start the DECnet software, and then refer to step 2 of Section 7.2.

3. Enter the following command and press Return:

```
$ RUN SYS$UPDATE:VMSTAILOR
```

VMSTAILOR displays a description of the VMSTAILOR program and the following message:

```
Do you want to tailor files "ON" or "OFF"?
```

4. Enter ON to add files and press Return.

The VMSTAILOR program lists each group, or *class*, of files and its size in blocks. Files are grouped according to their function. For example, all the files required for network support are in one class. A file class is made up of many smaller groups called *subclasses*. You can add an entire class of files, or you can add one or more of its subclasses. For example:

```
CLASS - Network support
          Size of entire class (with subclasses): 1499
          Size of common files required for any subclass: 1249
          Do you wish to select the entire class (default = NO)?
   .
   .
   .
```

5. Decide which file classes or subclasses you need to add. VMSTAILOR displays step-by-step instructions. Follow these instructions to specify which classes or subclasses of files you want to add.

6. VMSTAILOR adds the files you specified and displays the names of the files. After the files have been added, AUTOGEN runs automatically to make the adjustments that are necessary after system files are added. AUTOGEN also reboots the system.

Caution

To cancel VMSTAILOR during the first and second phases, press Ctrl/C, Ctrl/Y, or Ctrl/Z. Canceling VMSTAILOR during the third phase can cause a partially tailored disk.

For a description of each phase, see Section 10.1.1.

After adding files to the system disk, apply any updates that affect them. OpenVMS VAX update procedures create a .TXT file that contains a description of patched files. This file usually has the following format: SYS$UPDATE:VMSUn06n.TXT.

For example, assume that you do not need the OpenVMS Phone utility (PHONE) and you run VMSTAILOR to remove those files. Later, you decide you want to use Phone. Run VMSTAILOR to return the Phone files to the system disk; then, apply any OpenVMS VAX update that has occurred since Version 7.2 that affected the Phone utility.

10.1.4 Sample Session

Example 10–1 shows how to add all Network Support files and selected Programming Support files to a system disk.

Example 10–1 Sample VMSTAILOR Session

```
$ RUN SYS$UPDATE:VMSTAILOR
   .
   .
   .
 Do you want to tailor files "ON" or "OFF"? ON

TAILOR-ON
---------
 You will now be prompted with a list of the classes and subclasses
 of OpenVMS VAX files that are optional. The size of each class and subclass is included
 in the list. This will help you decide whether or not you want to add
 a class or subclass to your system.

 Under some classes, there is a set of common files that is required in order
 for any subclasses to work. These files are added when you ask
 for either the entire class or any of its subclasses.

Total size of the system disk is 2376153 blocks.
Total space used on the system disk is 2241252 blocks.
Total space left on the system disk is 134901 blocks.


CLASS - Network support
          Size of entire class (with subclasses): 1499
          Size of common files required for any subclass: 1249
          Do you wish to select the entire class (default = NO)? YES

CLASS - Programming Support
          Size of entire class (with subclasses): 14706
          Size of common files required for any subclass: 0
          Do you wish to select the entire class (default = NO)?
          Do you wish to select any of its subclasses (default = NO)? )YES
          Select the subclasses that you wish to provide:
             SUBCLASS - Debugger utility (DEBUG) (4690 blocks) [NO]: YES
             SUBCLASS - Image Dump utility (ANALYZE/PROCESS_DUMP) (48 blocks) [NO]: YES
             SUBCLASS - RMS Analyze and FDL Editor utilities (ANALYZE/RMS, ANALYZE/FDL)-
             (374 blocks) [NO]:YES
             SUBCLASS - Message utility (MESSAGE) (49 blocks) [NO]:
             SUBCLASS - Object and Shareable Image libraries (4311 blocks) [NO]: YES
             SUBCLASS - Macro libraries (2293 blocks) [NO]:
             SUBCLASS - Macro assembler (457 blocks) [NO]:
             SUBCLASS - SDL intermediary form of STARLET.MLB (1957 blocks) [NO]:
             SUBCLASS - FORTRAN require files (51 blocks) [NO]:
             SUBCLASS - VAX-C object libraries (471 blocks) [NO]:

CLASS - RMS journaling files
          Size of entire class (with subclasses): 155
          No subclasses in this tailor class.
          Do you wish to select the entire class (default = NO)?

CLASS - System programming Support
          Size of entire class (with subclasses): 2286
          Size of common files required for any subclass: 93
          Do you wish to select the entire class (default = NO)?
          Do you wish to select any of its subclasses (default = NO)?
```

(continued on next page)

Example 10–1 (Cont.) Sample VMSTAILOR Session

```
CLASS - Secure User's Environment
          Size of entire class (with subclasses): 919
          Size of common files required for any subclass: 0
          Do you wish to select the entire class (default = NO)?

          Do you wish to select any of its subclasses (default = NO)?

   .
   .
   .

Files have been selected
Do you wish to add all of the options selected? YES
Creating temporary command file, please wait...
* Enter device containing OpenVMS distribution media: mua0:

   .
   .
   .
```

10.2 Using DECW$TAILOR

You can use DECW$TAILOR to add or remove some or all DECwindows X11 display server, base support, and fonts files from the system disk. For example, if you are not planning to use the DECwindows PEX (PHIGS Extensions to X) support, you can remove those files. Later, if you decide you want DECwindows programming support, you can add the files to the system disk using DECW$TAILOR and your DECwindows distribution media. You cannot tailor files on or off an alternate device.

Note

To add or remove VMS DECwindows Motif files, refer to the *DECwindows Motif Version 1.2–3 for OpenVMS Installation Guide*. DECW$TAILOR will only tailor on or off those DECwindows display server, base support, and font files, with the exception of the required files, supplied on the OpenVMS VAX kit.

10.2.1 How DECW$TAILOR Works

DECW$TAILOR has three phases:

- DECW$TAILOR asks if you want to tailor your system by adding files (tailor on) or by deleting files (tailor off).
- If you choose to tailor files on, DECW$TAILOR lists each class of DECwindows files and asks if you want to include them on the system disk. If you choose to tailor files off, DECW$TAILOR lists each class of DECwindows files and asks if you want to delete them from the system disk.
- DECW$TAILOR adds or deletes the files you indicated from the system disk. If you are tailoring files on, you must load your DECwindows distribution media in a drive that is available to the system. For example, if your OpenVMS VAX distribution kit is on a TK50 tape cartridge, load the second tape cartridge, which contains the DECwindows support files, into a TK50 drive that is available to the system.

10.2.2 DECwindows Files You Can Tailor

The following is a list of classes and subclasses of DECwindows files that you can add or delete using DECW$TAILOR. For a list of DECwindows files and their functions, see Appendix E.

- DECwindows base support files — If you plan to install the separate DECwindows Motif for OpenVMS VAX layered product, you must add the base support files.
- DECwindows workstation support files — If you are installing DECwindows support on a workstation or in a cluster that includes workstations or if you intend to install the DECwindows Motif for OpenVMS VAX layered product, you need the workstation support files. Otherwise, you do not need them.

  Note

  If you tailor device support files ON or OFF, the system reboots.

- 100 dots/inch video font files — By default, some workstation monitors (for example, a VR150, VR160, or VR295) display 100 dots/inch, which gives you a more readable display when you run DECwindows applications. If your workstation monitor cannot display 100 dots/inch fonts (for example, a VR260 or VR290), you can save disk space by not selecting this option. For more information about the capabilities of your particular monitor, refer to the owner's guide for your monitor.
- 75 dots/inch video font files — If your workstation monitor cannot display 75 dots/inch, you can save disk space by not selecting this option. For more information about the capabilities of your particular monitor, refer to the owner's guide for your monitor.

10.2.3 Removing DECwindows Files

To remove DECwindows files from the system disk, do the following:

1. Log in to the SYSTEM account.
2. Type the following command, and press Return:

   ```
   $ RUN SYS$UPDATE:DECW$TAILOR
   ```

   DECW$TAILOR displays information about the DECW$TAILOR program and displays the following message:

   ```
   Do you want to tailor files "ON" or "OFF"?
   ```

3. Type OFF to remove unwanted files, and press Return.

   The DECW$TAILOR program lists each group, or *class*, of files and its size in blocks. Files are grouped according to their function. For example, all the files required for DECwindows device support are in one class. A file class is made up of many small subclasses. You can eliminate an entire class of files, or you can eliminate one or more of its subclasses. For example:

   ```
   CLASS - DECwindows workstation support files
            Size of entire class (with subclasses): 14301
            Size of common files required for any subclass: 8937
            Do you wish to select the entire class (default = NO)?
      .
      .
      .
   ```

4. Decide which file classes or subclasses you need to add. DECW$TAILOR displays step-by-step instructions. Follow these instructions to specify which of the classes or subclasses you want to remove.
5. DECW$TAILOR deletes the files you selected and displays the names of those files. If you deleted device support files, the system automatically shuts down and reboots.

Caution

To cancel DECW$TAILOR during the first and second phases, press Ctrl/C, Ctrl/Y, or Ctrl/Z. Canceling DECW$TAILOR during the third phase can cause a partially tailored disk.

For a description of each phase, see Section 10.2.1.

10.2.4 Adding DECwindows Files

To install DECwindows device support and font files after the OpenVMS VAX installation or to add optional DECwindows files that you previously chose not to install or that you removed, do the following:

1. Log in to the SYSTEM account.
2. Load the OpenVMS VAX distribution media containing the DECwindows save sets in a drive available to your system. For example, if your distribution media is a TK50 tape cartridge, load the second tape cartridge into a TK50 drive that is available to the system. Make sure the drive is on line and ready.

   If you are adding files from a compact disc on an InfoServer, first determine whether the SYSGEN parameter SCSNODE is defined on your system (see Section 5.5) or start the DECnet software, and then refer to step 2 of Section 7.2 in Chapter 7.
3. Enter the following command, and press Return:

   ```
   $ RUN SYS$UPDATE:DECW$TAILOR
   ```

   DECW$TAILOR displays information about the DECW$TAILOR program, and displays the following message:

   ```
   Do you want to tailor files "ON" or "OFF"?
   ```
4. Type ON to add files, and press Return.

   The DECW$TAILOR program lists each group, or *class*, of files and its size in blocks. Files are grouped according to their function. For example, all the files required for DECwindows device support are in one class. A file class is made up of many small subclasses. You can add an entire class of files, or you can add one or more of its subclasses. For example:

   ```
   CLASS - DECwindows workstation support files
            Size of entire class (with subclasses): 14301
            Size of common files required for any subclasses: 8937
            Do you wish to select the entire class (default = NO)?
      .
      .
      .
   ```

5. Decide which file classes or subclasses you do not need to support your system. The DECW$TAILOR program displays step-by-step instructions. Follow these instructions to specify which of the classes or subclasses you want to add.
6. DECW$TAILOR installs the files you selected and displays the names of those files. If you added device support files, the system automatically shuts down and reboots.

Caution

To cancel DECW$TAILOR during the first and second phases, press Ctrl/C, Ctrl/Y, or Ctrl/Z. Canceling DECW$TAILOR during the third phase can cause a partially tailored disk. For a description of each phase, see Section 10.2.1.

After adding files to the system disk, apply any updates that affect them. For example, suppose you delete the Version 7.2 DECwindows 100 dots/inch video font files. Later on, you are able to use the 100 dots/inch fonts, so you run DECW$TAILOR to return the files to the system disk. You must then apply any OpenVMS VAX update that has occurred since Version 7.2 that affected the 100 dots/inch video font files. OpenVMS VAX update procedures create a .TXT file that contains a description of modified files. This file is usually named with the following format: SYS$UPDATE:VMSUn05n.TXT[1].

10.2.5 Sample Session

Example 10–2 illustrates how to add the files for DECwindows 100 dots/inch font files.

Example 10–2 Sample DECW$TAILOR Session

```
$ RUN SYS$UPDATE:DECW$TAILOR
   .
   .
   .
 Do you want to tailor files "ON" or "OFF"? ON

TAILOR-ON
---------
 You will now be prompted with a list of the classes and subclasses
 of DECwindows files that are optional. The size of each class and subclass is
 included in the list. This will help you decide whether or not you want to add
 a class or subclass to your system.

 Under some classes, there is a set of common files that is required in order
 for any subclasses to work. These files are added when you ask
 for either the entire class or any of its subclasses.

Total size of the system disk is 2376153 blocks.
Total space used on the system disk is 1728072 blocks.
Total space left on the system disk is 648081 blocks.


CLASS - DECwindows base support files
          Size of entire class (with subclasses): 3363
```

(continued on next page)

[1] Examine this file to determine if the update patched the 100 dots/inch font files.

Example 10–2 (Cont.) Sample DECW$TAILOR Session

```
          No subclasses in this tailor class.
          Do you wish to select the entire class (default = NO)?


CLASS - DECwindows workstation support files
          Size of entire class (with subclasses): 12376
          Size of common files required for any subclass: 8916
          Do you wish to select the entire class (default = NO)? NO
          Do you wish to select any of its subclasses (default = NO)?

CLASS - 75 dots per inch video font files
          Size of entire class (with subclasses): 4537

          No subclasses in this tailor class.
          Do you wish to select the entire class (default = NO)?


CLASS - 100 dots per inch video font files
          Size of entire class (with subclasses): 3693
          No subclasses in this tailor class.
          Do you wish to select the entire class (default = NO)? YES

Files have been selected
Do you wish to add all of the options selected? YES
Creating temporary command file, please wait...
* Enter device containing DECwindows distribution media: MUA0:
   .
   .
   .
```

A

Multiversion VAX Upgrade Process

This appendix provides you with an quick method and an easy to follow set of directions to apply multiple OpenVMS VAX version upgrades to your current system.

Note

By following these directions, the time that you spend upgrading your VAX computer from Version 5.5-2 to Version 7.2 can be significantly reduced.

A.1 Determine Your Path

Your first step is to determine which upgrade path you need to perform. Table A–1 lists the recommended upgrade paths to reach OpenVMS VAX Version 7.2.

Table A–1 OpenVMS VAX Upgrade Version Matrix

Current Version	Intermediate Version(s)	Final Version
5.5-2	6.1, followed by 6.2, 7.0, or 7.1[1]	7.2
6.0	6.2	7.2
6.1	6.2	7.2
6.2	[2]	7.2
7.0	[2]	7.2
7.1	[2]	7.2

[1]You must perform two intermediate upgrades: First, upgrade to Version 6.1. Then, perform a second upgrade to either Version 6.2, 7.0, or 7.1, prior to your final upgrade to 7.2.

[2]No intermediate version needed.

A.2 Multiversion Upgrade Procedure

This procedure refers to an intermediate upgrade and final upgrade. An **intermediate upgrade** is defined as a version of the operating system that you need to install to reach your final version.

The **final upgrade** is the version of the operating system that you want to be running on your system at the end of this process.

Important

You should not plan to stay at the intermediate version. If you need to upgrade to and run the intermediate version, use the normal upgrade procedure located in the installation manual for that specific version.

A.2.1 Before You Begin the Upgrade

Before you begin the multiversion upgrade, you need to perform the following steps:

1. Locate the OpenVMS VAX software kits for the versions that you need.
2. Review the layered products on your system to determine the minimum supported version of each layered product to be installed on your final operating system version.
   - Determine which layered products you want to run on your system. See the web page at the following URL:

     `http://www.service.digital.com/openvms`
   - For information about specific layered products, see Section A.3.

A.2.2 Intermediate Upgrade

Follow these steps to perform an intermediate upgrade of your OpenVMS VAX operating system.

1. Review your mixed-cluster version environment. Compaq recommends that you upgrade all of your systems to the same version prior to performing a multiversion upgrade.
2. Review the firmware running on your system. For information about specific layered products, see Section A.3.
3. Review the version-specific documentation. Compaq recommends that you read the New Features, Release Notes, Installation Guide, and Software Product Description available in your software kit.
4. Review the preupgrade checklist located in the Installation Guide.
5. Perform the upgrade.

Important

For the intermediate upgrade, install only the base operating system. Do not install any options. By installing only the base operating system, the time that you spend upgrading your VAX computer during this intermediate upgrade can be reduced by 40 percent.

6. Perform the postupgrade checklist located in the Installation Guide.
7. If you are performing multiple intermediate upgrades, repeat steps 3-7 as necessary.
8. You have completed the intermediate phase of the multiversion upgrade procedure. Proceed to Section A.2.3 to apply the final upgrade phase of this procedure.

A.2.3 Final Upgrade

Follow these steps to perform the final upgrade of your OpenVMS VAX operating system.

1. Review the version-specific documentation. Compaq recommends that you read the New Features, Release Notes, Installation Guide, and Software Product Description available in your software kit.
2. Perform the preupgrade checklist located in the Installation Guide.
3. Perform the complete upgrade and select the optional files that you need for your final version.
4. Perform the postupgrade checklist located in the Installation Guide.
5. Upgrade the layered products on your system based on your review of layered products in Section A.2.1. See the web page at the following URL:

   `http://www.service.digital.com/openvms`

A.3 Specific Layered Product and Firmware Information

This section provides specific information about the following layered products and firmware:

- BASEstar
- Debugger

A.3.1 Layered Products

This section contains information about layered products.

BASEstar Classic Domain

A BASEstar Classic domain that consists of BASEstar Classic for OpenVMS VAX Versions 3.2 and 3.3 is fully supported on OpenVMS Version 7.2, as long as you obtained the kits through normal support channels.

However, on Alpha systems you need to be running BASEstar Classic Version 3.4. This means that any BASEstar Classic domain consisting of both VAX and Alpha systems can only have the VAX systems upgraded to OpenVMS Version 7.2 at this time.

Debugger Graphical User Interface (GUI)

To run the Debugger Graphical User Interface (GUI) on OpenVMS Version 7.2, you must be running the DECwindows Motif for OpenVMS layered product. See Section 1.1.3 for information about DECwindows Motif.

B

License Management Supplement

This appendix contains supplemental information to the license instructions given in the installation and upgrade procedures and in the *OpenVMS License Management Utility Manual*. Although most of the information in this appendix pertains to managing OpenVMS and System Integrated Product (SIP) licenses, some of the information pertains to managing layered product licenses.

This appendix covers the following information:

- Registering your licenses
- Using the License Unit Requirement Table (LURT)
- License Management Facility (LMF) notes
- Volume Shadowing for OpenVMS license
- Other System Integrated Product (SIP) licenses

B.1 Registering Your Licenses

This section provides an overview of the license registration procedure.

B.1.1 When to Register

After you install the OpenVMS VAX operating system, you must register an OpenVMS VAX license. An OpenVMS VAX license lets you use the operating system. You must also register the licenses for any of the following SIPs you have purchased:

- VAXclusters
- DECnet-Plus
- DECnet Phase IV
- OpenVMS RMS Journaling
- Volume Shadowing for OpenVMS

After you upgrade the OpenVMS VAX operating system, in most cases, there is no need to reregister licenses for the operating system or for SIPs.

In addition to the OpenVMS VAX operating system and the SIPs, many layered products—including DECwindows Motif for OpenVMS VAX—that run on OpenVMS VAX Version 7.2 also require license registration. Refer to the *OpenVMS License Management Utility Manual* for a full explanation of license registration.

B.1.2 How to Register

To register a license, you need to obtain a Product Authorization Key (PAK). A typical PAK is a piece of paper provided by Compaq Computer Corporation that contains the appropriate information to authorize access to software on a VAX computer or in a VAXcluster environment. You can obtain a PAK from a Compaq representative the same way as you obtain software.

See Table B–1 for a complete list of the versions of the OpenVMS VAX operating system and the VAX computers that were first supported by these versions.

Table B–1 First VMS or OpenVMS Version That Supports VAX Computers

VMS Version	First Computer Support
Version 5.0	VAX 6000 Model 2*xx*, VAX 8820–8840
Version 5.0–2A	MicroVAX 3300/3400
Version 5.1	VAX 6000 Model 3*xx*, MicroVAX 3800/3900
Version 5.1–B	VAXstation 3100, Model 30/40
Version 5.1–1	VAXstation 3520/3540
Version 5.2	VAX 6000 Model 4*xx*, MicroVAX 3100
Version 5.2–1	VAXstation 3100, Model 38/48
Version 5.3	No CPUs introduced
Version 5.3–1	No CPUs introduced
Version 5.3–2	VAX 4000 Model 300
Version 5.4	VAXstation 3100 Model 76, VAX 9000, VAX 6000 Model 5*xx*, VAXft 310
Version 5.4–1	No CPUs introduced
Version 5.4–2	VAX 4000 Model 200
Version 5.4–3	VAXft Models 410, 610, 612
Version 5.5	VAXstation 4000 VLC, MicroVAX 3100 Models 30, 40, and 80, VAX 6000 Model 600, VAX 4000 Model 500, VAXstation 4000 Model 60, and VAXft Model 110
Version 5.5–2	VAX 4000 Model 100, VAXstation 4000 Models 90 and 100, MicroVAX 3100 Model 90, VAX 4000 Model 400, VAX 4000 Model 600, VAX 7000 Model 600, and VAX 10000 Model 600
Version 5.5–2H4	VAX 4000 Models 100A, 500A, 600A, and 700A
Version 5.5–2HF	VAXft Model 810

OpenVMS Version	First Computer Support
Version 6.0	VAX 7000 Models 650 and 660, VAX 10000 Models 600 and 650
Version 6.1	VAX 7000 Model 7*xx*
Version 6.2	VAX 4000 Model 106A, MicroVAX 3500 Model 95A, MicroVAX 3100 Model 96, VAXstation 4000 Model 96

B.2 Using the License Unit Requirement Table (LURT)

Many PAKs contain a table name in the availability or activity fields. This name refers to a column in the License Unit Requirement Table (LURT). (For more information about using the LURT, refer to the *OpenVMS License Management Utility Manual*.)

Table B–2 has seven lettered columns (A, B, C, D, E, F, and I; G and H are reserved by Compaq and therefore are not listed). The numbers listed in these columns indicate the number of license units required for each processor listed in the System Marketing Model column. For example, if your PAK specifies *availability = F*, you would require 100 license units to load the license on a VAX–11/780 computer, or 4800 license units to load the license on a VAX 9000-430 computer.

Note that some PAKs specify MOD_UNITS in the options field. The MOD_UNITS option allows the system manager to use the DCL command LICENSE MODIFY /UNITS to temporarily increase the size of the PAK. This permits a product to be used, in certain emergency situations, on a processor larger than the processor size specified in the license. Check your license terms and conditions before modifying license units. Reset the PAK size to its original size after the emergency situation is resolved.

Table B–2 License Unit Requirement Table (LURT)

	License Types by Code						
	OpenVMS				SIP	LP	
System Marketing Model	A	B	C	D	E	F	I
VAX–11/730	10	NA	NA	NA	230	50	50
VAX 11/750	12	NA	NA	NA	230	100	100
VAX 11/780, 785	13	NA	NA	NA	230	100	100
VAX 6000-210, 6000-310	58	NA	NA	NA	230	300	300
VAXft 110	60	NA	NA	NA	230	100	100
VAXft 310, 410, 610, 810	58	NA	NA	NA	230	300	300
VAX 6000-220, 6000-320, 6000-410	69	NA	NA	NA	230	600	600
VAX 6000-230, 6000-330, 6000-510	81	NA	NA	NA	400	900	900
VAX 6000-240, 6000-340, 6000-350, 6000-420, 7000-610, 10000-610	93	NA	NA	NA	400	1200	1200

Key to License Type Codes and Values

A—OpenVMS Capacity or OpenVMS Unlimited or Base
B—OpenVMS Server
C—OpenVMS Concurrent user
D—OpenVMS Workstations
E—System integrated products
F—Layered products
G—Reserved (not listed)
H—OpenVMS reserved (not listed)
I—Layered products
NA—Not applicable

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Table B–2 (Cont.) License Unit Requirement Table (LURT)

	License Types by Code						
	OpenVMS				SIP	LP	
System Marketing Model	A	B	C	D	E	F	I
VAX 6000-540, 6000-640	170	NA	NA	NA	600	2400	2400
VAX 6000-550, 6000-650	195	NA	NA	NA	600	2400	2400
VAX 6000-560, 6000-660	220	NA	NA	NA	600	2400	2400
VAX 6000-610	81	NA	NA	NA	400	1200	1200
VAX 8200, 8250	20	NA	NA	NA	230	100	100
VAX 8300, 8350	25	NA	NA	NA	230	200	200
VAX 8500	63	NA	NA	NA	230	400	400
VAX 8530	65	NA	NA	NA	230	400	400
VAX 8550, 8700, 8810	72	NA	NA	NA	400	600	600
VAX 8600, 8650	28	NA	NA	NA	230	400	400
VAX 8800, 8820	93	NA	NA	NA	400	1200	1200
VAX 8830, 6000-360, 6000-430, 6000-520, 6000-620	119	NA	NA	NA	600	1800	1800
VAX 7000-620, 10000-620	145	NA	NA	NA	600	1800	1800
VAX 6000-440, 6000-450, 6000-460, 6000-530	143	NA	NA	NA	600	2400	2400
VAX 7000-630, 10000-630,	167	NA	NA	NA	600	2400	2400
VAX 7000-640, 10000-640,	197	NA	NA	NA	600	2400	2400
VAX 6000-630, 9000-210, 9000-410	143	NA	NA	NA	600	2400	2400
VAX 9000-420	241	NA	NA	NA	800	4800	4800
VAX 9000-430	330	NA	NA	NA	800	4800	4800
VAX 9000-440	386	NA	NA	NA	800	4800	4800
VAX 7000-710, 810	93	NA	NA	NA	230	600	600
VAX 7000-720, 820	193	NA	NA	NA	230	600	600
VAX 7000-730, 830	293	NA	NA	NA	230	600	600
VAX 7000-740, 840	393	NA	NA	NA	230	600	600
VAX 7000-750, 850	493	NA	NA	NA	230	600	600
VAX 7000-760, 860	593	NA	NA	NA	230	600	600
MicroVAX II	18	NA	100	NA	230	50	50

Key to License Type Codes and Values

A—OpenVMS Capacity or OpenVMS Unlimited or Base
B—OpenVMS Server
C—OpenVMS Concurrent user
D—OpenVMS Workstations
E—System integrated products
F—Layered products
G—Reserved (not listed)
H—OpenVMS reserved (not listed)
I—Layered products
NA—Not applicable

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Table B–2 (Cont.) License Unit Requirement Table (LURT)

	License Types by Code						
	OpenVMS				SIP	LP	
System Marketing Model	A	B	C	D	E	F	I
MicroVAX 2000, 3100-10e, 3100-20e, 3100-30, 3100-40, 3100-80	18	NA	100	NA	230	20	20
MicroVAX 3100-90, 3100-96, 3100-96A	60	NA	100	NA	230	20	20
MicroVAX 3500, 3600, 3800, 3900, 4000-200	60	NA	100	NA	230	200	200
MicroVAX 3300, 3400, 4000-100, 4000-106A	60	NA	100	NA	230	100	100
VAX 4000-100, 4000-106	60	NA	100	NA	230	100	100
VAX 4000-300, 4000-400, 4000-500A, 4000-600A, 4000-700A, 4000-706A	60	NA	100	NA	230	300	300
VAX 4000-500, 4000-600	60	NA	100	NA	400	900	900
VAXstation II, II/GPX	NA	NA	NA	100	50	10	10
VAXstation 2000, 2000/GPX	NA	NA	NA	100	50	10	10
VAXstation 3100, 3200, 3500, 3520, 3540, 4000-60, 4000 VLC, 4000-90, 4000-96	NA	NA	NA	100	50	10	10
VAXserver 2000	NA	52	NA	NA	50	10	10
VAXserver 3300, 3400, 3500, 3600, 3900, 4000-200, 4000-300	NA	100	NA	NA	50	10	10
VAXserver 6000-210, 6000-310	NA	1443	NA	NA	230	200	200
VAXserver 6000-220, 6000-320, 6000-410, 6000-420	NA	1737	NA	NA	230	400	400
VAXserver 6000-510	NA	600	NA	NA	230	400	400
VAXserver 6000-520	NA	890	NA	NA	230	400	400
VAXserver 9000-110, 9000-310	143	143	NA	NA	600	900	900
VAXserver 9000-320	241	241	NA	NA	800	1200	1200
VAXserver 9000-330	330	330	NA	NA	800	1200	1200
VAXserver 9000-340	386	386	NA	NA	800	1200	1200

Key to License Type Codes and Values

A—OpenVMS Capacity or OpenVMS Unlimited or Base
B—OpenVMS Server
C—OpenVMS Concurrent user
D—OpenVMS Workstations
E—System integrated products
F—Layered products
G—Reserved (not listed)
H—OpenVMS reserved (not listed)
I—Layered products
NA—Not applicable

B.3 License Management Facility (LMF) Notes

The following list is offered to help new users with some common concerns and questions regarding the License Management Facility (LMF).

- If you do not have a valid OpenVMS VAX license that is registered and activated, the system displays a warning message as part of system startup and restricts system use to the operator's console, OPA0.
- If a checksum error is displayed when you register a license, check *all* the fields of data that you entered, including the checksum itself.
- After your PAKs are registered, they are activated (loaded) automatically as part of each system startup.
- If an OpenVMS VAX availability license is registered with insufficient license units for the specified VAX computer, the system displays a warning message at system startup but allows normal system use at the console level only.
- If an OpenVMS VAX activity license is registered with insufficient license units to meet your user requirements, the system displays the following message when the user (process) attempts to log in:

  ```
  %LICENSE-F-EXCEEDED, licensed product has exceeded current license limits
  ```

  A user can always log in to the operator's console, OPA0, however.
- The default LICENSE database is located in the file SYS$COMMON:[SYSEXE]LMF$LICENSE.LDB. You can move the database, although Compaq does not recommend doing so. If you move the database, you must either define the logical name LMF$LICENSE at the system level to point to the new database or use the /DATABASE=*filespec* qualifier with all LICENSE commands. To redirect LMF to another database location on a more permanent basis, add the following line to the command procedure SYS$MANAGER:SYLOGICALS.COM:

  ```
  $ DEFINE/SYSTEM LMF$LICENSE device:[directory]LMF$LICENSE.LDB
  ```

  If you specify a device other than SYS$SYSDEVICE, you must also mount the specified disk from the SYLOGICALS.COM command procedure.
- Each VAX VMS and OpenVMS VAX Base license is restricted to a single node for permanent PAKs. You must assign a System Communications Services (SCS) name to the license when you register with the VMSLICENSE.COM command procedure, or you must enter a LICENSE MODIFY/INCLUDE=*node-name* command after you register the license. Although you can successfully activate an unassigned OpenVMS VAX license on a standalone system, you cannot activate one in a VAXcluster environment.

  Note

  The SCS node name is not necessarily the DECnet node name. SCSNODE is a system parameter; it can be a maximum of 6 alphabetic characters.

B.4 Volume Shadowing for OpenVMS License

The following paragraphs describe Volume Shadowing for OpenVMS licenses.

B.4.1 When to Register

After you *install* OpenVMS VAX Version 7.2, you *must* register your Volume Shadowing for OpenVMS license before you can use the volume shadowing software. If you *upgraded* to OpenVMS VAX Version 7.2, you do not need to reregister this license.

B.4.2 Volume Shadowing Software Phase I and Phase II

In the past, volume shadowing has offered two modes of operation: phase I and phase II. The original implementation of volume shadowing, phase I, was HSC controller-based. The newer implementation, phase II, is host-based and provides performance superior to phase I.

With the release of OpenVMS VAX Version 6.2, phase I volume shadowing is no longer available. Refer to the *Volume Shadowing for OpenVMS* manual for instructions about moving from phase I to phase II.

B.4.3 Types of Licenses

Two types of volume shadowing licenses are valid for OpenVMS VAX Version 7.2:

- Capacity license — If you are using this type of license, you must have one license for each node in a cluster that is accessing shadowed data.
- Per-disk license — If you are using this type of license, you must have one license for every disk contained in the shadow set.

  For information about OpenVMS VAX Version 7.2 changes to per-disk licensing for volume shadowing, see Section 1.1.2.

Refer to the *Volume Shadowing for OpenVMS* manual for more information about these two licenses.

B.5 Other System Integrated Product Licenses

After you *install* OpenVMS VAX Version 7.2, you *must* register licenses for any system integrated product. If you *upgraded* to OpenVMS VAX Version 7.2, you do not need to reregister licenses for system integrated products.

C

Booting from [SYSF] During an Upgrade

C.1 Booting Procedures

You must boot from the [SYSF] root during phases 2, 3, and 4 of the upgrade procedure. Different VAX computers require that you use different booting procedures. This appendix describes how to boot the various VAX computers from [SYSF].

Go to the section that describes your VAX computer and follow the instructions for booting from [SYSF]. If you need more information about booting, refer to the upgrade and installation supplement for your VAX computer.

C.1.1 MicroVAX and VAXstation Computers

The information in this section applies to the following VAX computers:

VAXstation II, VAXstation II/GPX, and MicroVAX II
VAXstation 2000 and MicroVAX 2000
VAXstation 3100 and MicroVAX 3100 series
VAXstation 3200 and 3500
VAXstation 3520 and 3540
VAXstation 4000
VAXft 110, 310, 410, 610, and 612
MicroVAX 3300, 3400, 3500, 3600, 3800, and 3900

To boot from [SYSF], enter the BOOT command in the following format and press Return:

```
>>> B/F0000000 device-name
```

Substitute the device name of the system disk for *device-name*.

C.1.2 VAX 8530, 8550, 8810 (8700), 8820-N (8800) Computers

To boot from [SYSF], use the following procedure:

1. Press Ctrl/P. Enter the following command at the console-mode prompt (>>>) and press Return:

   ```
   >>> HALT
   ```

2. Enter the BOOT command at the console-mode prompt (>>>) in the following format:

   ```
   >>> B dddn /R5:F0000000
   ```

   Substitute BCI, BDA, or UDA for *ddd*. Substitute the unit number of the drive holding the system disk for *n*.

C.1.3 VAX 8820, 8830, and 8840 Computers

To boot from [SYSF], use the following procedure:

1. Enter the following command at the PS-OS-0> prompt and press Return:

   ```
   PS-OS-0> HALT/CPU=ALL
   ```

2. Enter the BOOT command at the PS-CIO-0> prompt in the following format:

   ```
   PS-CIO-0> B dddn /R5=F0000000
   ```

   Substitute BCI or BDA for *ddd*. Substitute the unit number of the drive holding the system disk for *n*.

C.1.4 VAX–11/750, 8200, 8250, 8300, and 8350 Computers

To boot from [SYSF], create a command procedure named SYFBOO.CMD before the upgrade is started.

To create SYFBOO.CMD, use the following procedure:

Note

This procedure assumes that you have installed and booted the OpenVMS VAX operating system and are logged in to the SYSTEM account.

1. Log in to the SYSTEM account.
2. Make sure that the console media is in the console drive.
3. To connect the console drive to the system, enter the following commands and press Return after each one:

   ```
   $ RUN SYS$SYSTEM:SYSGEN
   SYSGEN> CONNECT CONSOLE
   SYSGEN> EXIT
   ```

4. Use the Exchange utility to copy the appropriate boot command procedure from the console media to your current directory on the system disk. If the system disk is on an HSC drive and you have created DEFBOO.CMD, enter the following command and press Return:

   ```
   $ EXCHANGE COPY CSA1:DEFBOO.CMD *
   ```

   On the VAX–11/750 computer, if the system disk is on a local drive, copy the boot command procedure that matches the drive that holds the system disk. For example, suppose the system disk is on an RP06 drive and has a controller designation of A and a unit number of one. Enter the following command and press Return:

   ```
   $ EXCHANGE COPY CSA1:DA1BOO.CMD *
   ```

5. Edit the boot command procedure. Change the line that deposits a value in register 5 (R5). This line contains the comment *!software boot flags*. The value is a hexadecimal number with eight digits. For example:

   ```
   D/G R5 0    !software boot flags
   ```

   Change the left-most digit of the value to reflect the name of the root directory from which you want to boot. For example, to boot from the [SYSF] root directory, change the line as follows:

   ```
   D/G/L R5 F0000000     !designated root is SYSF
   ```

6. Rename the boot command procedure to SYFBOO.CMD. For example, if the boot command procedure is DEFBOO.CMD, enter the following command and press Return:

   ```
   $ RENAME DEFBOO.CMD SYFBOO.CMD
   ```

7. Use the Exchange utility to copy SYFBOO.CMD back to the console media. Enter the following command and press Return:

   ```
   $ EXCHANGE COPY SYFBOO.CMD CSA1:SYFBOO.CMD
   ```

8. When the copy operation completes, enter the following command and press Return:

   ```
   $ DISMOUNT CSA1
   ```

9. To secure the console media from unauthorized access, you must enter the following command and press Return:

   ```
   $ MOUNT/FOREIGN/SYSTEM/NOWRITE/NOASSIST CSA1
   ```

To boot from [SYSF], use the following procedure:

1. Make sure the console media is in the console drive. On the VAX–11/750 computers, make sure the keylock switch is set to LOCAL. Set the BOOT DEVICE switch to position A.

   On the VAX 8200 computer, set the upper keylock switch to ENABLE and the lower keylock switch to HALT.

2. Press Ctrl/P.

3. On the VAX–11/750 computer, enter the following command and press Return:

   ```
   >>> B/800 DDA0
   ```

   On the VAX 8200 computer, enter the following command at the console-mode prompt (>>>) and press Return:

   ```
   >>> B/R5:800 CSA1
   ```

4. At the BOOT58> prompt, enter the following command:

   ```
   BOOT58> @SYFBOO.CMD
   ```

C.1.5 VAX–11/730, 11/780, 11/785, 8600, and 8650 Computers

To boot from [SYSF], create a command procedure named SYFBOO.CMD (for VAX–11/730, 11/780, and 11/785 computers) or SYFBOO.COM (for VAX 8600 and 8650 computers) before the upgrade is started.

To create SYFBOO.CMD or SYFBOO.COM, use the following procedure:

Note

This procedure assumes that you have installed and booted the OpenVMS VAX operating system and are logged in to the SYSTEM account.

1. Log in to the SYSTEM account.

2. Make sure that the console media is in the console drive. On the VAX 8600 computer, make sure the TERMINAL CONTROL switch is set to LOCAL.

3. To connect the console drive, enter the following commands and press Return after each one:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE
SYSGEN> EXIT
```

4. Use the Exchange utility to copy DEFBOO.CMD (for VAX–11/730, 11/780, and 11/785 computers) or DEFBOO.COM (for VAX 8600 and 8650 computers) from the console media to your current directory on the system disk. On the VAX–11/780, 11/785, and 8600 computers, enter a command similar to the following and press Return:

```
$ EXCHANGE COPY CSA1:DEFBOO.CMD *
```

   On the VAX–11/730 computer, enter the following command and press Return:

```
$ EXCHANGE COPY CSA2:DEFBOO.CMD *
```

5. Edit DEFBOO.CMD or DEFBOO.COM. Change the line that deposits a value in register 5 (R5). On the VAX–11/730, 11/780, and 11/785 computers, this line contains the comment *!software boot flags*. On the VAX 8600, this line contains the comment *!Use R5 for optional boot control flags [SYSB.]*. The value is a hexadecimal number with eight bits. For example:

```
DEPOSIT R5 10000000     !software boot flags
```

   Change the left-most digit of the value to reflect the name of the root directory from which you want to boot. For example, to boot from [SYSF], change the line as follows:

```
DEPOSIT R5 F0000000     !software boot flags
```

6. Rename DEFBOO.CMD to SYFBOO.CMD (or DEFBOO.COM to SYFBOO.COM), as follows:

```
$ RENAME DEFBOO.CMD SYFBOO.CMD
```

7. Use the Exchange utility to copy SYFBOO.CMD or SYFBOO.COM to the console media. On the VAX–11/780, 11/785, and 8600 computers, enter a command similar to the following:

```
$ EXCHANGE COPY SYFBOO.CMD CSA1:SYFBOO.CMD
```

   On the VAX–11/730 computer, enter the following command and press the Return key:

```
$ EXCHANGE COPY SYFBOO.CMD CSA2:SYFBOO.CMD
```

8. When you are finished, enter a command similar to the following and press Return:

```
$ DISMOUNT CSA1
```

9. To secure the console media from unauthorized access, you must enter a command similar to the following and press Return:

```
$ MOUNT/FOREIGN/SYSTEM/NOWRITE/NOASSIST CSA1
```

To boot from [SYSF] during an upgrade, use the following procedure:

1. Make sure the console media is in the console drive. On the VAX–11/730, 11/780, and 11/785 computers, make sure the keylock switch is set to LOCAL. On the VAX 8600, make sure the TERMINAL CONTROL switch is set to LOCAL.

2. Press Ctrl/P. On the VAX–11/780, 11/785, and 8600 computers, enter the HALT command at the console-mode prompt (>>>) and press Return:

   ```
   >>> HALT
   ```

3. Use SYFBOO.CMD to boot from [SYSF]. Enter the following command and press Return:

   ```
   >>> B SYF
   ```

C.1.6 VAX 6000 Series

To boot from [SYSF], use the following procedure:

1. If you have a CIBCA-A adapter and are booting over the CI, insert the console tape cartridge in the console drive.
2. Press Ctrl/P to put the system in console mode.
3. Enter the BOOT command in the following format:

   ```
   >>> BOOT /R5:F0000000  /XMI:a  /BI:b  [/R3:c]  [/NODE:d]  DUu
   ```

   where:

   - *a* is the XMI node number of the system disk.
   - *b* is the VAXBI node number of the system disk.
   - *c* pertains to volume shadowing. This qualifier is not required unless you are using volume shadowing. For more information, refer to the *Volume Shadowing for OpenVMS* manual.
   - *d* is the HSC node number of the node being accessed. The /NODE qualifier is not necessary if you are booting from a local disk. The HSC node number is in hexadecimal. You can deposit a maximum of two HSC node numbers (if two HSCs are available).
   - *u* is the unit number of the drive holding the system disk.

   For example, suppose you want to boot from [SYSF] on an HSC disk with a unit number of one and your system has the following configuration:

   - The disk is connected to the VAXBI at node 2.
   - The VAXBI you are using is connected to the XMI at node 3.
   - The disk is available to two HSCs, node numbers 0E and 02.

   Enter the following command and press Return:

   ```
   >>> BOOT/R5:F0000000/XMI:3/BI:2/NODE:0E02 DU1
   ```

C.1.7 VAX 9000 Series

The upgrade procedure automatically updates DEFBOO.CMD to boot from [SYSF]. If you want to boot a VAX 9000 computer manually from [SYSF] however, you must set up DEFBOO.CMD to boot from the system disk and perform the following procedure:

1. Press Ctrl/P to obtain the console prompt.
2. Enter the following BOOT commands:

```
>>> I/K
>>> BOOT/NOSTART
>>> DEPOSIT R5 F0000000
>>> CONTINUE
```

3. If you set up DEFBOO.CMD properly, the system boo $tsfromtheSYSFdirectoryonthesystemdisk, ana$

   If the system does not boot, enter the SHOW CONFIGURATION console command and verify that DEFBOO.CMD contains the correct information for your configuration. For more information, refer to the *OpenVMS VAX Upgrade and Installation Supplement: VAX 9000 Series*.

D

OpenVMS VAX Save Set Subclasses

This appendix lists the file subclasses contained in the following save sets:

- VMS072.C — Library save set
- VMS072.D — Optional save set
- VMS072.E — Help Message save set
- VMS072.F — OpenVMS Management Station save set

D.1 Save Set C Subclasses

The following files are contained in the Library save set:

- Network support

  Incoming Remote File Access files
  Incoming Remote Terminal files
  Network Test files
  Remote Task Loading

- Programming support

  Debugger utility (DEBUG)
  Image Dump utility (ANALYZE/PROCESS_DUMP)
  RMS Analyze and FDL Editor utilities (ANALYZE/RMS, ANALYZE/FDL)
  Message utility (MESSAGE)
  Object and Shareable Image libraries
  MACRO libraries
  MACRO assembler
  SDL intermediary form of STARLET.MLB
  Fortran required files
  VAX C object libraries
  VMS text libraries of Ada declarations

- OpenVMS RMS journaling files

- System programming support

  Files–11 ODS–1, ISO 9660, High Sierra ACPs
  Monitor utility
  Delta debugger
  System Dump Analyzer utility (ANALYZE/SYSTEM, ANALYZE/CRASH)
  System Symbol Table file (SYS.STB)
  Miscellaneous symbol table files

- Secure user's environment

  File Access Control List utilities
  Print and Batch Queue utilities
  Input Queue Symbiont (Card Reader)

Accounting Log Report Generator utility
DECdtm

- Utilities

  Mail utility
  Dump utility
  Runoff utility
  Phone utility
  OpenVMS Help library
  Foreign Terminal Support
  LAT-11 terminal server (via Ethernet)
  Standalone backup
  Error Log Report Generator utility (ANALYZE/ERROR)
  DECTPU
  Terminal Fallback Facility
  TECO Editor
  EDT documentation
  National Character Set utility (NCS)
  C language internationionalization utilities

- OpenVMS workstation support

  Workstation device support

D.2 Save Set D Subclasses

The following files are contained in the Optional save set:

- Miscellaneous files

  System map
  LPA-11 support

- BLISS required files
- UETP (the User Environment Test Package)
- Example files

D.3 Save Set E Subclasses

The following files are contained in the Help Message save set:

- Help Message database

D.4 Save Set F Subclasses

The following files are contained in the OpenVMS Management Station save set:

- OpenVMS Management Station software PC files

E

DECwindows Display Server and Fonts Components

This appendix provides a list of files provided by the DECwindows base and workstation support components included on the OpenVMS VAX distribution kit.

E.1 Table of Components

Table E–1 contains the name of the DECwindows display server and fonts components, the directory where the component can be found, a brief description of what the component does, and one of the following component classifications:

- BASE — Indicates that the component is part of all installations. BASE Component Class files are located in savests B and C.
- WS — Indicates that the component is part of the workstation support. WS Component Class files are located in savest D.
- FONT — Indicates the component is part of the fonts component. FONT cComponent Class files are located in savests E (75 DPI fonts) and C (100 DPI fonts).

Table E–1 DECwindows Display Server and Fonts Components

File	Purpose	Component Class
	Files in DECW$KEYMAP Directory	
DECW$KEYMAP		BASE

(continued on next page)

DECwindows Display Server and Fonts Components
E.1 Table of Components

Table E–1 (Cont.) DECwindows Display Server and Fonts Components

File	Purpose	Component Class
	Files in SYS$LOADABLE_IMAGES Directory	
GAADRIVER.EXE	VAXstation II/GPX driver	WS
GABDRIVER.EXE	VAXstation 2000/GPX driver	WS
GBBDRIVER.EXE	VAXstation 35x0 driver	WS
GCADRIVER.EXE	VAXstation II monochrome device driver	WS
GCBDRIVER.EXE	VAXstation 2000 monochrome device driver	WS
GEBDRIVER.EXE	Scanproc graphics device driver	WS
GECDRIVER.EXE	Spxg/gt graphics device driver	WS
GFBDRIVER.EXE	Low-cost graphics device driver	WS
IEDRIVER.EXE	Input extension driver	WS
IKDRIVER.EXE	Keyboard decoder driver	WS
IMDRIVER.EXE	Mouse decoder driver	WS
INDRIVER.EXE	Common input function driver	WS
WSDRIVER.EXE	Set display driver	BASE
	Files in SYS$SYSTEM Directory	
DECW$FONTCOMPILER.EXE	Font compiler image	FONT
DECW$MKFONTDIR.EXE	Font utility to generate list of fonts and paths	FONT
DECW$SERVER_MAIN.EXE	Server main image	WS
DECW$SETSHODIS.EXE	SHOW DISPLAY command image	BASE
	Files in DECW$FONT Directory	
See *VMS DECwindows Xlib Programming Volume*	DECwindows fonts	WS
	Files in DECW$EXAMPLES Directory	
DECW$FONT_ALIAS_CHARTER.DAT	Example alias file for Charter fonts	FONT
DECW$FONT_ALIAS_CHARTER_100DPI.DAT	Example alias file for 100 dpi Charter fonts	FONT
DECW$FONT_ALIAS_FILENAMES.DAT	Brief alias name list for shipped fonts	FONT
DECW$FONT_ALIAS_KANJI.DAT	Example alias file for Kanjifonts	FONT
DECW$FONT_ALIAS_LUCIDA.DAT	Example alias file for Lucida fonts	FONT
DECW$FONT_ALIAS_LUCIDA_100DPI.DAT	Example alias file for 100 dpi Lucida fonts	FONT

(continued on next page)

Table E–1 (Cont.) DECwindows Display Server and Fonts Components

File	Purpose		Component Class
	Files in SYS$LIBRARY Directory		
DECW$DRIVER.MLB	Driver macro library		WS
DECW$FONTCOMPILER.CLD	CLD for font compile commands		FONT
DECW$SERVER_DDX_GA.EXE	Server color device support shareable image		WS
DECW$SERVER_DDX_GB.EXE	Server color device support shareable image		WS
DECW$SERVER_DDX_GC.EXE	Server monochrome device support shareable image		WS
DECW$SERVER_DDX_GE.EXE	Server scanproc device-dependent shareable image	WS	
DECW$SERVER_DDX_GF.EXE	Server low-cost graphics device-dependent shareable image		WS
DECW$SERVER_DIX.EXE	Server device independent support		WS
DECW$SERVER_XINPUT_IE.EXE	Input extension for handling nonstandard input devices		WS
DECW$SESSIONSHRP.EXE	Support routines for DECwindows Session Manager		BASE
DECW$SVEXT_ADOBE_DPS_ EXTENSION.EXE	Display PostScript server extension image		WS
DECW$SVEXT_D2DX_ EXTENSIONS.EXE	DECwindows 2D extensions		WS
DECW$SVEXT_DEC_XTRAP.EXE	Input and event recording and playback extension	WS	
DECW$SVEXT_MULTI_ BUFFERING.EXE	DECwindows multibuffering extension		WS
DECW$SVEXT_X3D_PEX.EXE	Phigs Extension to X (PEX) for 3D		WS
DECW$SVEXT_X3D_PEX_GB.EXE	PEX for 35x0 systems		WS
DECW$SVEXT_X3D_PEX_GB_ UCODE.EXE	PEX microcode for 35x0 systems		WS
DECW$SVEXT_X3D_PEX_GE.EXE	PEX for scanproc systems		WS
DECW$SVEXT_X3D_PEX_STP.EXE	PEX for scanproc systems with geometry processor	WS	
DECW$SVEXT_X3D_PEX_STP_ UCODE.EXE	PEX microcode for scanproc systems with geometry processor		WS
DECW$SVEXT_X3D_PEX_VCFB.EXE	PEX color frame buffer (software PEX)		WS
DECW$SVEXT_XIE.EXE	DECwindows imaging extension		WS
DECW$SVEXT_ XINPUTEXTENSION.EXE	DECwindows input extension		WS
DECW$TRANSPORT_COMMON.EXE	Common transport shareable image		BASE
DECW$TRANSPORT_DECNET.EXE	DECnet transport image		BASE
DECW$TRANSPORT_LOCAL.EXE	Local transport image		BASE
DECW$TRANSPORT_TCPIP.EXE	TCP/IP transport image		BASE
DECW$XPORTCOM.H	Common transport definitions		BASE
DECW$XPORTCOM.MAR	Common transport definitions		BASE
DECW$XPORTCOM.R32	Common transport definitions		BASE
DECW$XPORTDEF.H	Transport definitions		BASE

(continued on next page)

Table E–1 (Cont.) DECwindows Display Server and Fonts Components

File	Purpose	Component Class
	Files in SYS$LIBRARY Directory	
DECW$XPORTDEF.MAR	Transport definitions	BASE
DECW$XPORTDEF.R32	Transport definitions	BASE
DECW$XPORTMAC.R32	Transport BLISS macros	BASE
DECW$XPORTMSG.R32	Transport message symbols	BASE
XDPS$MASTERDPSVM.DAT	Display PostScript support file	WS
	Files in SYS$MANAGER Directory	
DECW$DEVICE.COM	Device detection and configuration	BASE
DECW$DEVICE_GE.COM	Scanproc device detection and configuration	WS
DECW$DEVICE_GF.COM	Low-cost graphics device detection and configuration	WS
DECW$DEVICE_GG.COM	Scanproc turbo device detection and configuration	WS
DECW$RGB.DAT	Definitions of the color names used by the XStoreNamedColor and XAllocNamedColor requests	WS
DECW$STARTSERVER.COM	Server initialization and startup	WS
	Files in SYS$MESSAGE Directory	
DECW$TRANSPORTMSG.EXE	Transport message image	BASE
	Files in SYS$UPDATE Directory	
DECW$MKFONTDIR.COM	Command file to invoke DECW$MKFONTDIR.EXE font utility	FONT

F

NEW_OVER and NEW_UNDER Files

This appendix lists files installed either over or under existing files during an upgrade.

F.1 Where Files Are Installed

During an upgrade, the procedure replaces certain files that exist on your system with new versions of those files from the OpenVMS VAX distribution kit. For some system files, the upgrade procedure does not replace your existing system files, which might contain customizations for your site. Instead, the procedure retains your existing file and installs the new file from the kit at a version number higher or at a version number lower than your existing file.

You can use the DCL command DIFFERENCES to compare the contents of your existing files and the contents of the new files provided by OpenVMS VAX Version 7.2. Enter the command using the following syntax:

```
DIFFERENCES/OUTPUT=filespec existing_filename new_filename
```

The /OUTPUT qualifier causes the DIFFERENCES command to write the list of differences to the output file you specify. This output file has the default file type .DIF. For more information about using the DIFFERENCES command, refer to the *OpenVMS DCL Dictionary*.

New files that the procedure installs at a version number higher than your existing files are referred to as **new_over** files. You must use these files at least until you complete the upgrade. After you have upgraded your system, you can add your customizations to these files.

New files installed at a version number lower than the existing files are referred to as **new_under** files. This allows you to continue to use your existing files during and after the upgrade.

If you purge a new_over file, you are left with the new version of the file provided by the distribution kit, and any customizations you made to the existing file are lost. If you purge a new_under file, you are left with the file that existed before the upgrade.

In addition to the new_over and new_under files, there are certain files that are intended to contain your site-specific modifications. During an upgrade, the old versions of these files are retained if they were present before the upgrade. The new version of the file is installed only if no old version is present on your system. With the exception of TFF$STARTUP.COM, there is a corresponding .TEMPLATE file for each of the site-specfic files. The new version of the .TEMPLATE file replaces the old version.

NEW_OVER and NEW_UNDER Files
F.1 Where Files Are Installed

F.1.1 NEW_OVER Files

During an upgrade, the following new files are installed over (that is, at a version number higher than) the existing files:

[SYSEXE]SHUTDOWN.COM
[SYSEXE]STARTUP.COM
[SYSHLP]HELPLIB.HLB
[SYSLIB]ADARTL.EXE
[SYSLIB]BASRTL.EXE
[SYSLIB]BASRTL2.EXE
[SYSLIB]BLAS1RTL.EXE
[SYSLIB]COBRTL.EXE
[SYSLIB]DBLRTL.EXE
[SYSLIB]DCLTABLES.EXE
[SYSLIB]ENCRYPSHR.EXE
[SYSLIB]FORRTL.EXE
[SYSLIB]FORRTL2.EXE
[SYSLIB]IMAGELIB.OLB
[SYSLIB]LBRSHR.EXE
[SYSLIB]LIBRTL.EXE
[SYSLIB]LIBRTL2.EXE
[SYSLIB]MTHRTL.EXE
[SYSLIB]PASRTL.EXE
[SYSLIB]PLIRTL.EXE
[SYSLIB]PPLRTL.EXE
[SYSLIB]RPGRTL.EXE
[SYSLIB]SCNRTL.EXE
[SYSLIB]STARLET.OLB
[SYSLIB]UVMTHRTL.EXE
[SYSLIB]VAXCRTL.EXE
[SYSLIB]VAXCRTLG.EXE
[SYSLIB]VBLAS1RTL.EXE
[SYSLIB]VMSRTL.EXE
[SYSLIB]VMTHRTL.EXE
[SYSMGR]DBLSTRTUP.COM
[SYSMGR]WELCOME.TEMPLATE

F.1.2 NEW_UNDER Files

During an upgrade, the following new files are installed under (that is, at a version number lower than) the existing files:

[SYS$LDR]VMS$SYSTEM_IMAGES.DATA
[SYS$STARTUP]ESS$LAST_STARTUP.DAT
[SYS$STARTUP]VMS$LAYERED.DAT
[SYSEXE]VMS$IMAGE_VERSION.DAT
[SYSLIB]CDA$ACCESS.EXE
[SYSLIB]CDDSHR.EXE
[SYSLIB]DECW$DWTLIBSHR.EXE
[SYSLIB]DECW$PRINTWGTSHR.EXE
[SYSLIB]DECW$XLIBSHR.EXE
[SYSLIB]EPC$FACILITY.TLB
[SYSLIB]EPC$SHR.EXE
[SYSLIB]UISSHR.EXE
[SYSMSG]EPC$MSG.EXE
[SYSLIB]XDPS$DPSBINDINGSSHR.EXE

[SYSLIB]XDPS$DPSCLIENTSHR.EXE
[SYSLIB]XDPS$DPSLIBSHR.EXE
[SYSLIB]XNL$SHR.EXE
[SYSMGR]AMDS$DRIVER_ACCESS.TEMPLATE
[SYSMGR]AMDS$LOGICALS.TEMPLATE

F.1.3 Site-Specific Files

The following files are intended to contain site-specific modifications. Note that, with the exception of TFF$STARTUP.COM, there is a corresponding .TEMPLATE file for each of these files. The new version of the .TEMPLATE file replaces the old version.

[SYS$STARTUP]ICC$SYSTARTUP.COM
[SYSEXE]SYSUAF.DAT
[SYSMGR]AGEN$NEW_NODE_DEFAULTS.DAT
[SYSMGR]AGEN$NEW_SATELLITE_DEFAULTS.DAT
[SYSMGR]LAT$SYSTARTUP.COM
[SYSMGR]LOGIN.COM
[SYSMGR]SYCONFIG.COM
[SYSMGR]SYLOGICALS.COM
[SYSMGR]SYLOGIN.COM
[SYSMGR]SYPAGSWPFILES.COM
[SYSMGR]SYSECURITY.COM
[SYSMGR]SYSHUTDWN.COM
[SYSMGR]SYSTARTUP_VMS.COM
[SYSMGR]TFF$STARTUP.COM

G

Preparing to Use OpenVMS Management Station

During the OpenVMS installation or upgrade procedure, the OpenVMS Management Station software is automatically installed on your OpenVMS system disk when you accept all the default values.

If you did not accept the default values and did *not* manually select the OpenVMS Management Station component, you must add those files to your OpenVMS system disk before you follow the instructions in this appendix.

Use the OpenVMS operating system CD–ROM and the DCL command PRODUCT INSTALL TNT to add the OpenVMS Management Station files to your system. (Refer to the *OpenVMS System Management Utilities Reference Manual: M–Z* for complete information about using the PRODUCT command.)

After you have ensured that OpenVMS Management Station software is installed on your system, follow the procedures described in this appendix.

G.1 Preparing Your OpenVMS System

You must prepare your OpenVMS system to run the server software so that your system can properly interact with the PC running the client software. The procedures include the following:

- Set up within a mixed-architecture cluster environment (if applicable).
- Start the server on other nodes.
- Update the printer and storage database.
- Edit the system files.
- Allow OpenVMS Management Station to control the printer and storage environment.
- Keep your printer environment up to date.
- Check if running third-party TCP/IP stacks.
- Recover from a failure.
- Determine and report problems.

G.1.1 Setting Up in a Mixed-Architecture Cluster Environment

The OpenVMS Management Station server creates several configuration files:

- TNT$UADB.DAT
- TNT$ACS.DAT
- TNT$JOURNAL.TNT$TRANSACTION_JOURNAL
- TNT$MONITOR.DAT

- TNT$MONITOR.TNT$MONITOR_JOURNAL
- TNT$EMERGENCY_MOUNT.COM

In a common-environment cluster with one common system disk, you use a common copy of each of these files located in the SYS$COMMON:[SYSEXE] directory on the common system disk, or on a disk that is mounted by all cluster nodes. No further action is required.

However, to prepare a common user environment for an OpenVMS Cluster system that includes more than one common VAX system disk or more than one common Alpha system disk, you must coordinate the files on those disks.

The following rules apply:

- Disks holding common resources must be mounted early in the system startup procedure, such as in the SYLOGICALS.COM procedure.
- You must ensure that the disks are mounted with each cluster reboot.

Follow these steps to coordinate files:

1. Decide where to locate the files. In a cluster with multiple system disks, system management is much easier if the common system files are located on a single disk that is not a system disk.
2. Copy TNT$UADB.DAT, TNT$ACS.DAT, TNT$MONITOR.DAT, TNT$MONITOR.TNT$MONITOR_JOURNAL, TNT$EMERGENCY_MOUNT.COM, and TNT$JOURNAL.TNT$TRANSACTION_JOURNAL to a location other than the system disk.
3. Edit the file SYS$COMMON:[SYSMGR]SYLOGICALS.COM *on each system disk* and define logical names that specify the location of the cluster common files.

   Example

   If the files will be located on 1DJA16, define logical names as follows:

   ```
   $ DEFINE/SYSTEM/EXEC TNT$ACS -
   _$ $1$DJA16:[VMS$COMMON.SYSEXE]TNT$ACS.DAT
   ```

   TNT$EMERGENCY_MOUNT.COM will be created in SYS$SYSTEM or in the directory pointed to by the TNT$ACS logical, if the logical exists.

   ```
   $ DEFINE/SYSTEM/EXEC TNT$UADB -
   _$ $1$DJA16:[VMS$COMMON.SYSEXE]TNT$UADB.DAT

   $ DEFINE/SYSTEM/EXEC TNT$JOURNAL -
   _$ $1$DJA16:[VMS$COMMON.SYSEXE]TNT$JOURNAL.TNT$TRANSACTION_JOURNAL

   $ DEFINE/SYSTEM/EXEC TNT$MONITOR -
   _$ $1$DJA16:[VMS$COMMON.SYSEXE]TNT$MONITOR.DAT

   $ DEFINE/SYSTEM/EXEC TNT$MONITORJOURNAL -
   _$ $1$DJA16:[VMS$COMMON.SYSEXE]TNT$MONITOR.TNT$MONITOR_JOURNAL
   ```

4. To ensure that the system disks are mounted correctly with each reboot, follow these steps:
   1. Copy the SYS$EXAMPLES:CLU_MOUNT_DISK.COM file to the [VMS$COMMON.SYSMGR] directory, and edit it for your configuration.
   2. Edit SYLOGICALS.COM and include commands to mount, with the appropriate volume label, the system disk containing the shared files.

Example

If the system disk is 1DJA16, include the following command:

```
$  @SYS$SYSDEVICE:[VMS$COMMON.SYSMGR]CLU_MOUNT_DISK.COM -
_$ $1$DJA16: volume-label
```

G.1.2 Start the Server on Other Nodes

If you plan to run OpenVMS Management Station on more than one node in an OpenVMS Cluster without a reboot, you need to start the software on those nodes.

Use SYSMAN to start the server as follows:

```
$ @SYS$STARTUP:TNT$STARTUP.COM
```

Or, you can log into each node that shares the SYS$COMMON: directory and enter the following command:

```
$ @SYS$STARTUP:TNT$STARTUP.COM
```

If you are performing an upgrade or a reinstallation and OpenVMS Management Station is already running on the node, add the RESTART parameter to the startup command, as follows:

```
$ @SYS$STARTUP:TNT$STARTUP.COM RESTART
```

G.1.3 Error Log Information

OpenVMS Management Station writes error log information to the file TNT$SERVER_ERROR.LOG. This error log is created in the SYS$SPECIFIC:[SYSEXE] directory. If you start the OpenVMS Management Station server on multiple nodes in a cluster, which is recommended, there will be multiple server error logs.

G.1.4 Update the Printer and Storage Database

When you installed OpenVMS Management Station, the installation started the OpenVMS Management Station server on the installation node. If this installation was an upgrade, the server converts the existing OpenVMS Management Station database to the V3.0 format. If this was a new installation, the server creates an initial version of the database file TNT$ACS.DAT and invokes the update functions automatically.

To complete the database, start the OpenVMS Management Station server on each node in your cluster. The instances of the server communicate with each other to determine device, queue, and volume information, and the server must be running on each node for this communication to take place.

G.1.5 Edit the System Files

To start the OpenVMS Management Station server from your system startup files, insert one of the following commands into your system startup procedures (probably SYS$MANAGER:SYSTARTUP_VMS.COM) after both the Queue Manager and network are started, but immediately prior to the ENABLE AUTOSTART/QUEUES.

Note

Remove any other invocations of TNT$STARTUP you might have added in previous releases of the OpenVMS Management Station.

G.1 Preparing Your OpenVMS System

OpenVMS Management Station cannot start until the network has started. If you start your network using a batch process, OpenVMS Management Station might start before the batch process completes and the network is started.

Command	Parameter 1	Parameter 2	Description
@TNT$STARTUP	blank	N.A.	Starts the server. Does not start printer queues or mount volumes.
@TNT$STARTUP	RESTART	N.A.	Shuts down a running server, then starts the server. Does not start printer queues or mount volumes.
@TNT$STARTUP	BOOT	blank	Starts the server. Starts any printer queues that are not yet started and are managed by OpenVMS Management Station. Does not mount volumes managed by OpenVMS Management Station.
@TNT$STARTUP	BOOT	ALL	Starts the server. Starts any printer queues that are not yet started and are managed by OpenVMS Management Station. Mounts any volumes that are not yet mounted and are managed by OpenVMS Management Station.
@TNT$STARTUP	BOOT	PRINTERS	Starts the server. Starts any printer queues that are not yet started and are managed by OpenVMS Management Station. Does not mount volumes managed by OpenVMS Management Station.
@TNT$STARTUP	BOOT	STORAGE	Starts the server. Mounts any volumes that are not yet mounted and are managed by OpenVMS Management Station. Does not start any printer queues.

Note that the effect of TNT$STARTUP BOOT, with no second parameter, has not changed from earlier releases. This command starts any printer queues that are not yet started and are managed by OpenVMS Management Station, but does not mount any volumes.

Add the following command line to the system shutdown file, SYS$MANAGER:SYSHUTDWN.COM:

```
$ @SYS$STARTUP:TNT$SHUTDOWN.COM
```

G.1.6 Allow OpenVMS Management Station to Control the Printer and Storage Environment

It is not necessary to remove your existing queue startup and volume mount DCL procedures immediately. The OpenVMS Management Station server will recognize that you started a queue or mounted a volume with your command procedures and will assume that you want it that way.

As you become familiar with the server's management ability, you can remove or comment out the DCL commands and procedures that perform these tasks and allow OpenVMS Management Station to control your printer and storage environment.

In addition, the OpenVMS Management Station server periodically (every 24 hours) generates a DCL command procedure that includes the commands to mount all of the volumes managed by OpenVMS Management Station. If you are familiar with DCL, you can look at this command procedure to see what actions OpenVMS Management Station performs for you. And, in the event of an unforeseen system problem or a corrupt server database (SYS$SYSTEM:TNT$ACS.DAT), you could use this command procedure to mount the volumes.

The name of the generated file is TNT$EMERGENCY_MOUNT.COM. TNT$EMERGENCY_MOUNT.COM is created in SYS$SYSTEM or in the directory pointed to by the TNT$ACS logical, if that logical name exists.

The OpenVMS Management Station server limits TNT$EMERGENCY_ MOUNT.COM to seven versions.

G.1.7 Keeping Your Printer Environment Up-to-Date

The OpenVMS Management Station server installation creates a file named SYS$STARTUP:TNT$UTILITY.COM. This command procedure scans the OpenVMS system and updates the database of known printers, queues, and related devices.

G.1.7.1 When is the Database Updated?

The database is updated:

- As part of the OpenVMS Management Station installation.
- When you specifically invoke TNT$UTILITY.COM.
- At periodic intervals as a server background thread. Two logical names control how often this server thread runs:

Logical Name	Description
TNT$PRINTER_RECON_ INTERVAL	How often the thread should run, in minutes, from when the server was last started on this node. If you do not define this logical, the default value is 1440 minutes (24 hours).
TNT$PRINTER_RECON_ INTERVAL_MIN	The minimum number of minutes that must elapse before the thread should run again, starting from when the database was last updated. If you do not define this logical, the default value is 60 minutes (1 hour).

You can think of these logicals as meaning ‘‘run the thread this often (TNT$PRINTER_RECON_INTERVAL), but make sure this much time has elapsed since the database was last updated (TNT$PRINTER_RECON_ INTERVAL_MIN).’’

Because you can run TNT$UTILITY.COM yourself, and because the OpenVMS Management Station server also updates the database, the TNT$PRINTER_ RECON_INTERVAL_MIN logical prevents the database from being updated more frequently than is actually needed.

If you want to change the defaults for one of these logicals, define the logical on all nodes on which the OpenVMS Management Station server is running.

G.1.7.2 Do You Need to Run TNT$UTILITY.COM Manually?

If you use OpenVMS Management Station to make all of the changes to your printer configuration, the configuration files are immediately modified to reflect the changes and you probably do not need to specifically run TNT$UTILITY.COM.

However, if you or someone else uses DCL to make a change — for example, if you use the DELETE /QUEUE command to delete a queue — the configuration files will not be synchronized. In this case, the OpenVMS Management Station client will advise you to run TNT$UTILITY.COM to resynchronize the database.

Run the following procedure on one node in the cluster to make the database match your system:

```
$ @SYS$STARTUP:TNT$UTILITY.COM UPDATE PRINTERS
```

For example, if you or someone else used DCL to delete a queue, you need to delete that queue from the database. TNT$UTILITY.COM assumes that your system is set up and running the way that you want it to, so you should fix any problems before you run TNT$UTILITY.COM.

G.1.7.3 Are There Any Requirements for Running TNT$UTILITY.COM?

You need the SYSNAM privilege to run TNT$UTILITY.COM.

TNT$UTILITY.COM connects to the OpenVMS Management Station server on the current OpenVMS system to determine device and queue information. Therefore, the OpenVMS Management Station server must be running on the node where you run TNT$UTILITY.COM.

The OpenVMS Management Station server then connects to the other OpenVMS Management Station servers in the OpenVMS Cluster to determine device and queue information. It is generally a good idea to keep the OpenVMS Management Station server running on the other nodes in an OpenVMS Cluster to keep the database up to the minute.

However, if the OpenVMS Management Server is not able to connect to the OpenVMS Management Station server on a given node, it uses the known information about that OpenVMS node from the database. That is, in the absence of a valid connection to that OpenVMS node, the information in the database is assumed to be correct.

G.1.8 Keeping Your Storage Environment Up-to-Date

The TNT$UTILITY.COM utility accepts parameters (UPDATE STORAGE) to update the storage database. However, the storage database is updated dynamically every time you use the OpenVMS Management Station client to perform a storage management operation. Therefore, you do not need to run TNT$UTILITY.COM to update the storage database.

G.1.9 Enabling Disk Quotas

Before installing OpenVMS Management Station, you might have disabled disk quotas on the SYSTEM disk. If so, you should reenable the quotas and then rebuild to update quota information by entering the following commands:

```
$ RUN SYS$SYSTEM:DISKQUOTA
DISKQUOTA> ENABLE
DISKQUOTA> REBUILD
DISKQUOTA> EXIT
```

G.1.10 Caching Storage Configuration Data

OpenVMS Management Station uses two logical names to determine how often to refresh cached (in-memory) storage configuration data.

- TNT$PURGE_CYCLE_LATENCY—Determines how often to wait (in seconds) after purging stale device reports before purging again. This value affects how frequently the cluster-wide data (maintained by a ‘‘master server’’ is updated in memory.

  ```
  min = 180
  default =  1800   (30 minutes)
  max = 18000       (5 hours)
  ```

- TNT$LOCAL_SURVEY_LATENCY—Determines the delay (in seconds) from one node-specific device survey to the next. This value is independent of cluster-wide surveys requested by the ''master server'' when performing a purge.

```
min = 6
default =  60  (1 minute)
max = 600      (10 minutes)
```

For both logical names, smaller values result in the OpenVMS Management Station server consuming more CPU cycles in periodic purges or surveys.

If you do not accept the defaults, you might find that larger OpenVMS Cluster systems behave better with values on the high end of the allowed range.

If you do not define these logicals, the OpenVMS Management Station server uses the default values. If you do define these logical names, the values are used only if they are within the minimum to maximum range.

G.1.11 Running Third-Party TCP/IP Stacks

DIGITAL TCP/IP Services for OpenVMS Version 3.2 or higher is the only supported TCP/IP stack. Additional stacks have not been tested. However, TCP/IP stacks that are 100% compliant with the QIO interface for DIGITAL TCP/IP Services for OpenVMS should also work. (Contact your TCP/IP vendor for additional information and support issues.)

For the best chance of success, check the following:

- Make sure that the QIO service (for example, UCXQIO) is enabled.
- For TCPware, also make sure that TCPware's UCX$IPC_SHR.EXE is an installed image.
- Also for TCPware, make sure you are running a version of TCPware that correctly implements a DECC-compatible socket interface, such as Version 5.3-3.

G.1.12 Determining and Reporting Problems

If you encounter a problem while using OpenVMS Management Station, please report it to Compaq. Depending on the nature of the problem and the type of support you have, you can take one of the following actions:

- If your software contract or warranty agreement entitles you to telephone support, call Compaq.
- If the problem is related to OpenVMS Management Station documentation, use the Internet address printed in front of this book to send us your comments.

G.1.13 Removing the OpenVMS Management Station Server

If you use the POLYCENTER Software Installation utility to remove OpenVMS Management Station from the OpenVMS system, the following files are not removed:

- TNT$ACS.DAT
- TNT$JOURNAL.TNT$TRANSACTION_JOURNAL
- TNT$SERVER_ERROR.LOG
- TNT$UADB.DAT

- TNT$EMERGENCY_MOUNT.COM

Do not delete these files unless you have already removed OpenVMS Management Station.

G.2 Preparing Your PC

During the OpenVMS installation or upgrade procedure, you selected the OpenVMS Management Station client software files to be installed on your OpenVMS system disk (or you added them later using the DCL command PRODUCT INSTALL TNT). After you have prepared your OpenVMS system to run the server software, you must next prepare your PC to run the client software.

This section includes the following information:

- Required memory and disk space
- Required software
- Installing the client software
- Getting started using OpenVMS Management Station

G.2.1 Required Memory and Disk Space

Your PC requires 13 MB of free disk space to install the OpenVMS Management Station client software.

G.2.2 Distribution Files

There are two versions of the OpenVMS Management Station client kit: TNT030_I.EXE for Intel systems (Windows 95 and Windows NT), and TNT030_A.EXE for Alpha Windows NT systems. Both of these files are located in the SYS$COMMON:[TNT.CLIENT] directory.

The Intel kit will not install under FX!32 running on Alpha processors; use the Alpha native kit in this case.

G.2.3 Required Software

Microsoft Windows NT Versions 4.0 (Service Pack 3 or higher) or Windows 95 or higher (Intel only) must be installed on each PC on which you want to install the OpenVMS Management Station client.

The version of MMC included in this baselevel requires files provided by Microsoft Internet Explorer. Version 3.02 or later of Internet Explorer must be present on the system.

G.2.4 Time Required for Installation

The time required to install the OpenVMS Management Station client software is approximately 5 minutes.

G.2.5 Copy the Client File to the PC

The client files TNT030_I.EXE (Intel) and TNT030_A.EXE (Alpha) are located in the SYS$COMMON:[TNT.CLIENT] directory. Copy either client file to a temporary directory the PC using any of the following procedures:

- Create a file share to the OpenVMS system and copy the file.
- Use FTP on the PC to copy the file from the OpenVMS system.

G.2.6 Installation Directory

The installation procedure allows you to select the installation directory, and suggests \Program Files\OpenVMS Mgmt Station\ as the default.

G.2.7 Installation Procedure

Run TNT030_I.EXE (Intel) or TNT030_A.EXE (Alpha) from a temporary directory. These are self-extracting executable files that automate the OpenVMS Management Station installation.

G.2.8 Recovering from Errors

If an error occurs during installation, you will receive an error message describing the problem. This information can help you determine the cause of the problem. An error can occur during the installation if one or more of the following conditions exist:

- The operating system version is incorrect.
- Disk space and memory necessary for successful installation are inadequate.

G.3 After Installing the Client Software on Your PC

When you create an OpenVMS Cluster or OpenVMS Node object in an OpenVMS Management Domain, you select the transport you want to use for all connections to that system. You can choose DECnet Phase IV or TCP/IP.

OpenVMS Management Station uses this transport for all communications between the PC and this system, or between any other OpenVMS system that is running the OpenVMS Management Station server and this system.

Note

The OpenVMS Management Station client supports only TCP/IP connections for primary servers. That is, the connection between the PC and the OpenVMS system uses only TCP/IP. Therefore, at least one OpenVMS system **must** be running TCP/IP.

You do need to make sure that your PC can connect to the primary-server systems, as described in the following sections. OpenVMS Management Station connects your PC to the primary-server system and then routes management operations to the target systems.

G.3.1 Defining TCP/IP Nodes

Your hosts file or name server must be able to resolve the IP name or address of all primary-server systems. If you can successfully ping the primary-server systems from your PC, then this condition is met.

G.4 Uninstalling Version 2.1 of the OpenVMS Management Station Client

Version 3.0 of the OpenVMS Management Station client is not dependent on Version 2.1 and does not share any files with this prior version. After installing the Version 3.0 client, you can uninstall the Version 2.1 client software.

G.5 Uninstalling OpenVMS Management Station

If you need to uninstall the OpenVMS Management Station client software, make sure you first exit OpenVMS Management Station. The uninstallation fails if OpenVMS Management Station is currently running.

If you run the OpenVMS Management Station Help, the following files might be created:

- VMSMGMT.FTS
- VMSMGMT.GID
- VMSPRINT.FTS
- VMSPRINT.GID
- VMSSCOPE.FTS
- VMSSCOPE.GID
- VMSSTORE.FTS
- VMSSTORE.GID
- VMSACNT.FTS
- VMSACNT.GID

The OpenVMS Management Station Uninstall program does not delete these files. To complete the uninstall:

1. Delete these files
2. Delete the OpenVMS Management Station directory

Note that the OpenVMS Management Station Uninstall program does not uninstall the Microsoft Management Console (MMC) support files.

G.6 Getting Started with OpenVMS Management Station

All information about getting started, setting up, and using OpenVMS Management Station is contained in online help and the *OpenVMS Management Station Overview and Release Notes*.

H

Small Capacity System Disks

This appendix describes some methods you can use to manage small capacity system disks. Some specific recommendations are also included for installing or upgrading to OpenVMS VAX Version 7.2 and DECwindows Motif for OpenVMS VAX Version 1.2–3 on an RZ24, RA80, or RM80 system disk. (These recommendations also apply to Versions 1.1 and 1.2 of the DECwindows Motif for OpenVMS VAX layered product.)

Note that you can use the methods described in this appendix to free disk space on any space-constrained system.

H.1 Limited Space Support

As the OpenVMS VAX operating system and associated layered products continue to develop and mature, their sizes have grown. Previously acceptable system disk devices might now have insufficient capacity for the desired computing environment. Support for added features, conformance to standards, addition of online documentation, and especially, support for a graphical user environment (specifically, DECwindows Motif) have contributed to this growth. Although a single-user workstation system might be perceived as entry level, it does, in fact, have an increased need for system disk capacity to handle the desired graphical environment.

H.1.1 Limited Space Support Option

In the past, when the OpenVMS VAX operating system grew too large for a specific disk type, that disk was no longer supported as a system device. The OpenVMS VAX Version 7.2 operating system and the DECwindows Motif for OpenVMS VAX Version 1.2–3 layered product cannot fit, in total, on an RZ24 disk device.

However, to preserve the investment in some user configurations, a *limited space support* option has been introduced that allows the RZ24 to continue to be used as a system disk but with some features removed. For the most part, these features include new online documentation, programming examples, and programming support files. The most important mechanisms used to provide this environment are the OpenVMS VAX and DECwindows tailoring facilities, VMSTAILOR and DECW$TAILOR. (For more information about these facilities, see Chapter 10.)

The limited space support option means that, although the disk (in this case, the RZ24) is supported as a system device, you must take some explicit action to remove or not to install some portions of the product so the remainder fits. This option gives small, resource-constrained system users a choice between investing in new hardware or continuing with existing hardware but with (possibly) reduced capabilities.

H.1.2 Configurations Affected

The RZ24 disk is now too small for the full OpenVMS VAX Version 7.2 and DECwindows Motif for OpenVMS VAX Version 1.2–3 kits, regardless of the user's configuration. Other disk devices, such as the RZ24 and RD54 disks, need to be closely monitored, depending on the system environment and user configuration.

The general disk space guideline for OpenVMS VAX plus DECwindows Motif for OpenVMS VAX Version 1.2–3 is a system disk of at least 213 megabytes (or about 377,000 disk blocks). For nonworkstation, single-user systems, this guideline can be reduced to about 125 megabytes because DECwindows support is not necessary. For timesharing systems, a larger disk is usually necessary due to the need for many layered products and applications. For VAXcluster systems, a larger system disk capacity is also usually required. Refer to the VAXcluster SPD for details.

For specific information about disk space requirements and supported system disks, refer to the OpenVMS VAX SPD.

While the absolute minimum disk space requirements can make base system support available, layered products, applications, and user files usually make it necessary to manage even large capacity system disks carefully. Therefore, some of the following techniques and ideas can be useful for a broader range of users than can be listed by hardware type.

H.1.3 Dealing with a Small System Disk

You can solve small system disk configuration problems in three ways:

- Upgrade your hardware to a larger capacity disk device.
- Add additional hardware disk devices (one or more) to the system and redistribute the software contents.
- Reduce the software contents on the existing disk device.

Upgrading hardware might have the highest monetary cost, but has the benefits of a full environment and the simplest and fastest upgrade mechanism. Adding additional hardware (or using existing extra hardware) can require less money, but requires more time and effort for setting up and maintaining the environment. Reducing the software contents requires the lowest capital expense but, by necessity, removes some features, documentation, or capabilities.

If your major constraint is fiscal, you might want to investigate the tailoring recommendations first. If time or simplicity are more important, you might want to purchase a larger system disk.

H.2 Tailoring Considerations

Most of this appendix describes the mechanisms for reducing the software contents on the existing disk device, mostly by tailoring. There are also some hints for multiple disk systems. There is nothing specific to recommend for upgrading the hardware device, except that moving up in a single large increment is much more effective than several smaller ones.

The target device in the following sections is the RZ24 disk, which has 209 megabytes of disk space. However, you can use these methods on any system that is tight on system disk space.

H.2.1 Configuration Goals

The basic configuration goal for the limited space support option is for an environment that is not used for programming. Typically, this is a system with a few user applications or a turnkey system. It is possible to build a viable system with a single programming language environment (notably, the C language); however, the space used for this support and for the compiler reduces the amount of available user space.

There are some mechanisms and techniques common to any space-constrained system both for installing new systems and for upgrading existing systems. One of the most important considerations is to reduce the disk space consumption of the normal, ongoing system environment before doing an upgrade or as soon as possible during or after an installation. Some methods for accomplishing this are discussed in Section H.5 and in Section H.6.

Note that, during an upgrade or installation, there is a period of time when the windowing software is likely to be unavailable. This means that, on a workstation, your monitor functions only as an operator console, and you cannot use screen-oriented editors.

H.2.2 Controlling the Size of Dump, Page, and Swap Files

One of the primary things to control is the sizing of the dump, page, and swap files in AUTOGEN. The tailoring facilities automatically use AUTOGEN to reboot the system, adjusting anything that the tailoring might have affected. Because AUTOGEN normally includes existing disk space in calculating the sizes for these files, unexpected results can occur when tailoring removes some files and AUTOGEN increases the size of others. Fixing the size of these files by adding appropriate lines to the file SYS$SYSTEM:MODPARAMS.DAT will prevent this from occurring during an upgrade or after an installation (and, possibly, while installing layered products).

The following values are suggested as generous for an upgrade:

```
PAGEFILE = 38000
SWAPFILE = 13500
DUMPFILE = 0
```

If your system has been running successfully with smaller values, use those instead.

If your windowing system is unavailable, you cannot use a screen-oriented editor to add these lines to the SYS$SYSTEM:MODPARAMS.DAT file. You can use the COPY command to add lines to the end of the text file as follows:

```
$ COPY SYS$SYSTEM:MODPARAMS.DAT,SYS$INPUT: SYS$SYSTEM:MODPARAMS.DAT Return
newparam1 = value1 Return
newparam2 = value2 Return
Ctrl/Z
```

Note

To be able to use the delete key more effectively when typing input to the console, set the operator terminal to be a scope (assuming it is not a hardcopy device). To set the console terminal to be a scope, enter the following command:

```
$ SET TERM/SCOPE/PERM _OPA0:
```

H.2.3 Make a Backup Copy of Your System Disk

It is important to make a backup copy of your system disk before any system software upgrade. When tailoring and system environment options must be used to fit the required software on the device, it is even more important to make a backup copy before you begin and at major milestones during the procedure. This gives you a fallback to a *last good* position in the event that a subsequent step produces undesired side effects (especially when tailoring software off of the disk) or fails because you unexpectedly ran out of disk space.

H.2.4 Analyze the System Disk

The space used on the system disk might include files that have been only partially deleted (usually, because they were still open when an attempt was made to delete them). To recover this space, enter the following command:

```
$ ANALYZE/DISK/REPAIR SYS$SYSDEVICE:
```

Continue to use the ANALYZE/DISK/REPAIR command after every reboot or before each major step to be sure that all free blocks are available for the upgrade procedure to use.

H.2.5 Tailoring Options

The installation and upgrade procedures (for both OpenVMS VAX Version 7.2 and DECwindows Motif) let you select optional software to install or upgrade only by save set. The tailoring facilities are capable of finer granularity and can usually select files in smaller groups within the save sets.

In the case of DECW$MOTIF_TAILOR, the save sets and tailoring groups are the same. Additionally, DECW$MOTIF_TAILOR can only tailor off. To add files, you must either use the installation or upgrade procedures or use the OpenVMS Backup utility (BACKUP) manually to select the desired files. For the VMSTAILOR and DECW$TAILOR utilities, the tailorable options are subsets of the installation and upgrade save sets and can be tailored either on or off. If there is sufficient space to take an entire save set, it is usually faster to select it during the procedure and then tailor off the undesired pieces, rather than tailor them on later.

If you performing an upgrade and have a large area of user application files or a large database that is not part of the OpenVMS VAX operating system or DECwindows Motif layered product but resides on the system disk, it might be convenient to back up that data to a separate piece of media, delete it from the system disk before the upgrade, and then restore it after the upgrade. The blocks can be used in the interim, and you can save time and effort in the tailoring and upgrade processes.

You can decrease the time needed to perform the tailoring and upgrade tasks by disabling the high-water mark on the system disk. To disable the high-water mark, enter the following command:

```
$ SET VOLUME/NOHIGHWATER SYS$SYSDEVICE:
```

Depending on the system security you require, you might want to leave the high-water mark permanently disabled. Otherwise, you can restore it by entering the following command:

```
$ SET VOLUME/HIGHWATER SYS$SYSDEVICE:
```

H.3 Installing OpenVMS VAX and DECwindows Motif

In general, installing OpenVMS VAX Version 7.2 and DECwindows Motif for OpenVMS VAX Version 1.2–3 is easier than doing an upgrade because there are no user files on the disk when you perform the installation. However, because the total size of the two kits is larger than the capacity of the RZ24 disk, you cannot select some options and you might have to do some tailoring.

H.3.1 Install OpenVMS VAX Version 7.2

By itself, the entire OpenVMS VAX Version 7.2 distribution kit fits on the RZ24 system disk. So, the easiest approach might be to select both the library and optional save sets, then use the VMSTAILOR and DECW$TAILOR utilities to increase the free space before installing the DECwindows Motif layered product.

If you plan to run DECnet for OpenVMS, be sure to select the library save set. If you do not perform system programming or BLISS programming, do not have an LPA11 device, do not need any of the OpenVMS example files, and do not need the UETP facility, you can choose not to select the optional save set during the installation. The BLISS support in the optional save set (approximately 7000 blocks) and the examples (over 8500 blocks) are two of the largest single areas that you can easily tailor off.

You might choose not to install the Help Message utility (MSGHLP) because this option is also very large (8900 blocks). Or, you can select it at the expense of other tailorable options later (or at the expense of reduced user capacity).

Once the OpenVMS VAX installation is complete, set up the dump file as required. It is preferable not to have a dump file at all or to use the paging file as described in Section H.5.1. Also, set fixed sizes for the page and dump files so that AUTOGEN does not continually resize them as you proceed with tailoring and installing the DECwindows Motif for OpenVMS layered product. When your environment is complete, you can remove the fixed sizes to allow AUTOGEN to calculate appropriate sizes based on the final space on the disk.

To fit the operating system on an RZ24 disk and have sufficient space to add some layered product or application packages and have user space remaining, you can generally support, at most, one programming language and no online examples or manuals. Use the VMSTAILOR and DECW$TAILOR utilities to remove software you do not need.

H.3.2 Install DECwindows Motif

Depending on the options and setup of your system, you might have sufficient space to install the entire DECwindows Motif for OpenVMS kit. However, it is likely that you again will need to remove support for all but one programming language and not include the examples. Because the programming support save sets for each language are large, choose only the support for languages you really need. In the case of the example files, you might want to install them if you have the space required, and then tailor them off once you have perused them or copied them to another area.

Remember to use the ANALYZE/DISK/REPAIR command to recover any lost space from partially deleted files.

H.4 Upgrading OpenVMS VAX and DECwindows Motif

The following sections describe how to upgrade to OpenVMS VAX Version 7.2 with the DECwindows Motif Version 1.2–3 layered product from an OpenVMS Version 6.1 or 6.2 system running VMS DECwindows Motif Version 1.1. (Note that Version 1.1 is the *minimum* version of DECwindows Motif that you can run on OpenVMS VAX Version 7.2.)

This option requires the most attention and extra tailoring consideration because the disk blocks used by the DECwindows Motif layered product cannot be used during the OpenVMS VAX upgrade procedure. This means that you might not be able to select even the library save set during the upgrade and that you will need to tailor on portions of it (most notably, the DECnet support).

Depending on your configuration, it might be necessary to tailor off DECwindows Motif and then reinstall it following the upgrade.

H.4.1 Upgrading to OpenVMS VAX Version 7.2

Before beginning the upgrade procedure, prepare the system environment — notably the dump, page, and swap files (see Section H.2.2) — and remove as many excess files from the system disk as possible. Use the tailoring facilities to remove files that will be replaced or obsoleted by the upgrade procedure. This is a good way to get the necessary space (48,950 blocks) to start the upgrade but probably does not contribute to the final additional capacity required.

Tailor off all the OpenVMS programming files, examples, and miscellaneous utilities and any DECwindows Motif support that is not required. Before upgrading the operating system, keep, at most, one language support option, and do not keep any DECwindows Motif examples unless you have sufficient space to get at least the OpenVMS VAX required and library save sets directly in the upgrade.

If you have sufficient space after tailoring to allow both the OpenVMS VAX required and library save sets to be selected, then the upgrade will include DECnet support and DECwindows Motif will start normally after the upgrade.

If you cannot select the library save set, the lack of DECnet support will likely keep DECwindows Motif from starting on your system (at which point you will have only the operator window on your workstation). You can then tailor on the DECnet support to get DECwindows Motif for OpenVMS running again. After you have DECwindows Motif running, tailoring on any other pieces you might not have already acquired from either the library or optional save sets will be easier.

Compaq recommends that you not take the optional Help Message utility (unless you install it on an alternate device). You want to choose the DECwindows device support if you are upgrading a workstation.

Remember to use the ANALYZE/DISK/REPAIR command to clean up any partially deleted files.

H.5 Managing Single or Small System Disk Systems

The primary goal for this type of environment is to reduce the system disk block usage incurred by the OpenVMS VAX system during normal operation. Both dynamic usage and static requirements can be reduced in various ways. Some system processing overhead can also be reduced or eliminated in this manner, along with a corresponding reduction in system disk I/O.

H.5.1 System Dump File

One of the best mechanisms for reducing the total block overhead of the system is to carefully define the usage of the system dump file. Normally, this is configured as a separate file, SYS$SYSTEM:SYSDUMP.DMP, to which the contents of memory are written after a detected system failure. Depending on your system requirements, you might be able to reduce or eliminate this disk usage.

One effective technique is to use part of the system paging file, SYS$SYSTEM:PAGEFILE.SYS, as a temporary dump file, so that the space used for dump files is not permanently reserved and gets used only in the event of a crash. To do this, you need to modify some system parameters in SYS$SYSTEM:MODPARAMS.DAT and delete the actual SYSDUMP.DMP file if it exists. This method is most effective for systems having small or medium memory sizes.

Alternately, you might set the DUMPSTYLE parameter to use the selective dump mechanism to reduce the size of the dump file. This method is typically used for large memory systems that do not need to preserve the entire memory contents in the event of a system failure. Instead of using selective dumps to the paging file, keep a separate, but smaller, SYSDUMP.DMP file.

If you have no need to preserve dump files or are running in a very stable environment, you might want to clear the DUMPBUG parameter to avoid all dump processing and not write a dump file on failure.

H.5.2 Using PAGEFILE.SYS for the Dump File

To use the system paging file as a dump file, add the following lines to the SYS$SYSTEM:MODPARAMS.DAT file:

```
DUMPBUG = 1  ! Enable system dumps (default)
SAVEDUMP = 1  ! Keep dump in pagefile until analysis
DUMPFILE = 0  ! Disallow AUTOGEN to create or size dump file
```

Then delete the SYSDUMP.DMP file by entering the following command:

```
$ DELETE SYS$SYSTEM:SYSDUMP.DMP;*
```

Because the system currently has the file open, the delete command does not physically remove the file until the system is shut down and rebooted. Use the AUTOGEN facility to reboot the system. When it has rebooted, enter the following command to clean up and finish the deletion of the file (and any others that were in a similar state):

```
$ ANALYZE/DISK/REPAIR SYS$SYSDEVICE:
```

After a system failure that writes dump information to the page file, you can analyze the data by entering the following command:

```
$ ANALYZE/CRASH SYS$SYSTEM:PAGEFILE.SYS
```

When your analysis is complete, you can free the pages to be used for paging once again by entering the following command:

```
$ ANALYZE/CRASH/RELEASE SYS$SYSTEM:PAGEFILE.SYS
```

For more information about the system dump file, refer to the *OpenVMS VAX System Dump Analyzer Utility Manual*.

H.5.3 Decompressing Libraries

The OpenVMS help libraries (as well as some programming libraries) are distributed in a compressed format. You can use the SYS$UPDATE:LIBDECOMP.COM procedure to decompress the libraries all at once or individually. For a small system disk, it is almost never worth the extra disk blocks consumed to decompress these libraries. The cost of leaving them compressed is a longer access time when you use them.

If you frequently use help or an individual programming library, it might be worthwhile to individually decompress those libraries. If you only infrequently use help or do not mind the slower response time of the libraries in compressed form, leave them compressed.

H.5.4 Disabling Log File Creation

Depending on your environment, there might be system jobs that create log files of no concern to you or that contain more information than you need.

Unless you are a network manager or experiencing network problems, you probably do not need to log network events. By not logging network events, you can save disk space, a process slot, and some memory in the running system. To disable network logging, enter the following commands:

```
$ MCR NCP PURGE KNOWN LOGGING ALL
$ MCR NCP CLEAR KNOWN LOGGING ALL
```

You need to enter these commands only once; they become permanent unless you reset the DECnet logging information.

To reduce the logging information for other tasks (such as OPCOM, Accounting, Security Auditing, Network Monitor Event Listener, and system-created batch log files), you need to add some commands to your system-specific startup command file, SYS$MANAGER:SYSTARTUP_VMS.COM (previously called SYSTARTUP_V5.COM).

The following is an example SYSTARTUP_VMS.COM command file for a single-user workstation:

```
$ SET NOON     ! Continue thru any problems.
$!
$ DEFINE/USER SYS$COMMAND _OPA0:  ! Disable some events from
$ REPLY/DISABLE=(NETWORK,CLUSTER,SECURITY) !  using the operator window.
$ SET TERM/SCOPE/PERM _OPA0:   ! If windows do not start, use as scope.
$!
$ SET AUDIT/ALARM -    ! Log interesting audit events.
 /ENABLE=(AUDIT,AUTHORIZATION,ACL,LOGIN=(LOCAL,DIALUP,NETWORK,REMOTE),-
  LOGFAILURE=ALL,BREAKIN=ALL)
$!
$ IF F$SEARCH("SYS$MANAGER:ACCOUNTNG.DAT;-1") .NES. "" THEN -
    PURGE SYS$MANAGER:ACCOUNTNG.DAT/KEEP=4 ! Purge old accounting info
$!
$ IF F$SEARCH("SYS$MANAGER:OPERATOR.LOG;-1") .NES. "" THEN -
    PURGE SYS$MANAGER:OPERATOR.LOG/KEEP=4 ! Purge old operator info
$!
$ DEFINE/SYSTEM/EXEC SYS$SYLOGIN SYS$MANAGER:SYLOGIN ! Set up system login
$!
$ ENABLE AUTOSTART/QUEUES   ! Provide resources for autostart queues
$ START/QUEUE SYS$BATCH    ! Start a batch queue
$!
$ SUBMIT/NOKEEP/NOPRINT SYS$MANAGER:STARTNET ! Start net without batch log
$!
$! ...  add other system specific and layered product commands here ...
$!
$ EXIT
```

You might have an environment that can function with even less information than that shown in the example. For example, to disable the operator log file, use REPLY/NOLOG, or to disable accounting, use SET ACCOUNTING/DISABLE. For more information about using these commands, refer to the *OpenVMS DCL Dictionary*.

H.5.5 Accessing Example and Documentation Files

If you have network access to another OpenVMS system (especially a timesharing system), you do not need to duplicate the example files distributed in the OpenVMS VAX or DECwindows Motif kits if they are available on the remote system. Similarly, remote access to the online documentation files also saves considerable disk space on any system with constrained disk space.

H.6 Managing Multiple Disk Systems

The following sections describe techniques for managing multiple disk systems. In addition to the goal of reducing the space requirements on the system device, it is possible to simultaneously reduce some of the I/O load to the system disk by redirecting necessary functions to an alternate device.

H.6.1 Alternate Page and Swap Files

Setting up alternate page and swap files is one of the best ways to reduce both the system disk space usage and I/O overhead. If you set up only a small primary page file on the system disk and install additional page and swap files in the startup command file SYS$MANAGER:SYPAGSWPFILES.COM, you can permanently cause these files to consume the least amount of space on the system device. For more information about setting up alternate page and swap files, refer to the *OpenVMS System Manager's Manual*.

H.6.2 Copying Dump Files

At startup, you can enhance the use of the paging file as a dump file that automatically copies the dump data for later analysis. This releases the disk space in SYS$SYSTEM:PAGEFILE.SYS to be used for paging automatically as well. Instead of manually invoking the System Dump Analyzer (SDA) to release the pages, you can add the following commands to the SYS$MANAGER:SYSTARTUP_VMS.COM file:

```
$ ANALYZE/CRASH SYS$SYSTEM:PAGEFILE.SYS
COPY alternate_disk:[dir]dumpname.ext
EXIT
```

Note

The dump file, whether it is SYSDUMP.DMP or PAGEFILE.SYS, must reside on the system disk. This might limit the actual savings you can achieve using alternate page files.

H.6.3 Offloading System Logs and Files

There are several system logs and files that can be redirected to another device. For other system logs and files, it might be easier to reset and start a new log file, copy the old file or files to another device, and purge them from the system disk.

Some files that can be redirected are the system authorization file, the queue manager database, the audit log file, and batch log files. Some files that can be reset, copied, and purged are the operator log file, the accounting log file, and network log files. For more information about these facilities refer to the *OpenVMS System Manager's Manual*, the *OpenVMS DCL Dictionary*, or the utility reference manual for the utility whose files you want to offload.

H.6.4 Offloading Nonessential Files

Some of the files included with OpenVMS VAX Version 7.2 can be redirected to an alternate device during the installation or upgrade procedure. This can save many valuable system disk blocks while providing quick access to these files. For a small system disk configuration with multiple disks, this approach is recommended if you want the the Help Message utility (MSGHLP) to be available on line.

Glossary

This glossary defines key terms in the context of an OpenVMS VAX computing environment.

boot, bootstrap

The process of loading system software into a processor's main memory. This guide uses the term *boot* to refer to this process.

boot command procedure

A program, stored on the console fixed disk, that is used to boot the OpenVMS operating system from a specified controller. Compaq provides a boot command procedure for each controller that the processor supports.

boot name

The abbreviated name of the boot command procedure you use to boot the system.

boot server

A VAX computer that is part of a local area VAXcluster. The boot server is a combination of a MOP server and a disk server for the satellite system disk. See also satellite node.

CI only VAXcluster

A computer system consisting of a number of VAX computers. It uses only the computer interconnect (CI) to communicate with other VAX computers in the cluster. These computers share a single file system.

computer interconnect (CI)

A type of I/O subsystem. It links VAX computers to each other and to HSC devices. See also *Hierarchical Storage Controller (HSC) device.*

DECW$TAILOR

A software program that lets you add or remove DECwindows files from your system disk.

device name

The name used to identify a device on the system. A device name indicates the device code, controller designation, and unit number.

disk server

A VAX computer that is part of a local area VAXcluster. This computer provides an access path to CI, CSSI, and locally connected disks for other computers that do not have a direct connection.

Hierarchical Storage Controller (HSC) device

A self-contained, intelligent, mass storage subsystem that lets VAX computers in a VAXcluster environment share disks. Examples are the HSC50 and the HSC70.

HSC drive

Any disk or tape drive connected to an HSC device is called an HSC drive. A system disk on an HSC drive can be shared by several VAX computers in a VAXcluster environment.

InfoServer

A general-purpose disk storage server that allows you to use the distribution compact disc to install the operating system on remote client systems connected to the same local area network (LAN).

local area VAXcluster

A configuration consisting of one or more VAX computers that act as a MOP server and disk server, and a number of low-end VAX computers that act as satellite nodes. The local area network (LAN) connects all of the computers. These computers share a single file system.

local drive

Any drive that is connected directly to a VAX computer.

media

Any packaging agent capable of storing computer software (For example, compact discs, magnetic tapes, floppy disks, disk packs, and tape cartridges.)

MOP server

A computer system running DECnet software that downline loads VAXcluster satellites using the DECnet maintenance operations protocol.

satellite node

A VAX computer that is part of a local area VAXcluster. A satellite node is downline loaded from a MOP server and then boots remotely from the system disk served by a disk server in the local area VAXcluster. See also boot server, disk server, MOP server.

save set

The format in which the Backup utility stores files. The OpenVMS operating system is shipped in this format.

scratch disk

A blank disk or a disk with files you no longer need.

source drive

The drive that holds the distribution kit during an upgrade or installation.

spin up, spin down

To spin up means to bring a disk drive up to operating speed; to spin down means to bring it to a gradual stop.

standalone BACKUP

A subset of the BACKUP utility that is booted into main memory instead of running under the control of the OpenVMS operating system. Standalone BACKUP is used to back up and restore the system disk and to install OpenVMS operating system software.

standalone system

A computer system with only one VAX computer.

system disk

The disk that contains or will contain the OpenVMS operating system. An OpenVMS system disk is set up so that most of the OpenVMS files can be shared by several VAX computers. In addition, each computer has its own directory on the system disk that contains its page, swap, and dump files.

target drive

The drive that holds the system disk during an upgrade or installation.

transaction log

A log used by DECdtm services to record information about transactions. The Log Manager Control Program (LMCP) is used to create a transaction log.

UETP (User Environment Test Package)

A software package that tests all the standard peripheral devices on your system, various commands and operating system functions, the system's multiuser capability, DECnet for OpenVMS, and the VAXcluster environment.

VAXcluster environment

A computer system consisting of a number of VAX computers. There are three types of VAXcluster environments: CI only, local area, and mixed interconnect.

VMSTAILOR

A software program that lets you add or remove optional OpenVMS files from your system disk.

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