OpenVMS VAX Version 6.2 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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Operating System and Version: OpenVMS VAX Version 6.2

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Preface

Introduction

This manual is your primary source for information about upgrading and installing the OpenVMS VAX Version 6.2 operating system. Before you attempt to install or upgrade the operating system, be sure to read all the release notes and cover letters (if any) included in your distribution kit.

Who Should Use This Manual

If you are responsible for installing or upgrading the OpenVMS operating system and for performing related backup, shutdown, and startup procedures, read this manual before you install or upgrade to Version 6.2 of the OpenVMS VAX operating system.

How to Use This Manual

If you received factory-installed software with your computer, read that user documentation first for information about starting up your system. Otherwise, use this manual for step-by-step instructions for performing an installation or an upgrade. 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.

How This Manual Is Organized

The information in 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 OpenVMS VAX operating system.
- Chapter 3 describes how to install Version 6.2 of the OpenVMS VAX operating system on a VAXcluster or a standalone VAX computer.
- Chapter 4 lists the tasks you should perform after you install the OpenVMS VAX operating system.
- Chapter 5 contains cautions, restrictions, and requirements for upgrading your VAX computer system and tells you how to prepare your system for an upgrade.
- Chapter 6 contains additional information for upgrading a VAXcluster environment.

- Chapter 7 describes the procedure for upgrading a standalone VAX computer.
- Chapter 8 lists the tasks you should perform after the upgrade.
- 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 notes and supplemental license management information to the upgrade and installation procedures.
- Appendix B describes how to boot from the [SYSF] directory on the different types of VAX computers.
- Appendix C lists the subclasses in the OpenVMS VAX optional save sets C, D, E, F, and G.
- Appendix D lists DECwindows display server and font files.
- Appendix E lists files installed either over or under the version numbers of existing files during an upgrade.
- Appendix F describes how to prepare your OpenVMS system and your PC to run the OpenVMS Management Station server and client software.
- Appendix G describes methods for managing small capacity system disks, including some specific recommendations for installing or upgrading to the OpenVMS VAX Version 6.2 operating system and the DECwindows Motif for OpenVMS Version 1.2–3 layered product.
- The Glossary defines commonly used terms.
- The Index provides a quick way to find information.

Associated Documents

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

- 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.
- *OpenVMS Version 6.2 Release Notes* —Describes changed and enhanced software features, software problems and restrictions, and changes to the documentation for Version 6.2 of the OpenVMS VAX operating system.
- *OpenVMS Version 6.2 New Features Manual*—Describes new software features for the OpenVMS Version 6.2 operating system.

- *VMScluster Systems for OpenVMS*—Describes the procedures for establishing and managing VAXcluster configurations.
- *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.
- *OpenVMS DCL Dictionary*—Provides detailed reference information and examples for all OpenVMS DCL commands.
- The hardware manuals supplied with your VAX computer provide detailed information about system hardware.

Conventions Used in This Manual

In this manual, every use of OpenVMS VAX means the OpenVMS VAX operating system.

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, 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.)
. . .	A horizontal ellipsis in examples indicates one of the following possibilities: • Additional optional arguments in a statement have been omitted. • The preceding item or items can be repeated one or more times. • Additional parameters, values, or other information can be entered.

. . .	A vertical ellipsis indicates the omission of items from a code example or command format; the items are omitted because they are not important to the topic being discussed.
( )	In format descriptions, parentheses indicate that, if you choose more than one option, you must enclose the choices in parentheses.
[ ]	In 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 format descriptions, braces surround a required choice of options; you must choose one of the options listed.
boldface text	Boldface text represents the introduction of a new term or the name of an argument. Boldface text is also used to show user input in Bookreader versions of the manual.
italic text	Italic text emphasizes important information, indicates variables, and indicates complete titles of manuals. Italic text also represents information that can vary in system messages (for example, Internal error *number*), command lines (for example, /PRODUCER=*name*), and command parameters in text.
UPPERCASE TEXT	Uppercase text indicates a command, the name of a routine, the name of a file, or the abbreviation for a system privilege.
-	A hyphen in code examples indicates that additional arguments to the request are provided on the line that follows.
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

Overview of Installation and Upgrade Procedures

Overview

This chapter describes what happens during the installation and upgrade procedures. It lists changes since the previous version and cautions and restrictions you should be aware of for OpenVMS VAX Version 6.2. It 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.

Cautions, Restrictions, and Changes

Introduction

This section describes cautions and restrictions you should be aware of and the new or changed features in the OpenVMS Version 6.2 installation and upgrade procedures.

Cautions

DECnet Requirements

The OpenVMS VAX Version 6.2 kit includes the DECnet for OpenVMS (DNA Phase IV) software. If your are currently running the DECnet/OSI for OpenVMS layered product, the OpenVMS Version 6.2 kit detects this and gives you the option to retain those files. If you want to install the Phase IV code base, you have the option to do so. However, you will not be able to use DECnet over TCP/IP if you choose Phase IV.

If you want to run the DECnet/OSI for OpenVMS layered product on your OpenVMS Version 6.2 systems, you must upgrade to Version 6.1 of DECnet/OSI for OpenVMS. This version of DECnet/OSI allows you to run DECnet applications over TCP/IP.

Before you upgrade to Version 6.1 of DECnet/OSI for OpenVMS, note the following requirements:

If . . .	Then . . .
You are upgrading from OpenVMS Version 6.1,	You can upgrade to Version 6.1 of DECnet/OSI prior to upgrading your OpenVMS system.
You are upgrading from OpenVMS Version 6.0,	You must upgrade your OpenVMS system before upgrading to Version 6.1 of DECnet/OSI.
You are running DEC TCP/IP Services for OpenVMS,	You must upgrade to Version 3.2 of the DEC TCP/IP Services for OpenVMS product before upgrading to Version 6.1 of DECnet/OSI.
You are running TCP/IP from another vendor,	Consult your TCP/IP vendor for the minimum version of their product that will support DECnet applications.

The DECnet for OpenVMS VAX Extensions product is not supported for OpenVMS VAX Version 6.2. The network products associated with DECnet for OpenVMS VAX Extensions (P.S.I., WANDD, VOTS, OSAK, and FTAM) are no longer available separately. If you need these products, you must migrate to Version 6.1 of DECnet/OSI for OpenVMS. For information about

planning for and implementing DECnet/OSI for OpenVMS software, see the DECnet/OSI installation and configuration manuals.

Volume Shadowing Phase I Not Available.

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

For more information about migrating to phase II, see *Volume Shadowing for OpenVMS*.

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 the Macro libraries before building standalone backup onto tape.

Layered Product Availability. For the most current information about OpenVMS VAX layered products, contact your Digital sales representative.

Restrictions

Restrictions for OpenVMS VAX Version 6.2 include:

- The minimum memory requirement is 4 megabytes.
- The MA780 shared memory is not supported.
- You cannot install or upgrade to Version 6.2 of the OpenVMS VAX 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, and RZ22

- If your system uses an RZ23L or some other small capacity system disk (less than 175 megabytes), the entire OpenVMS VAX Version 6.2 operating system *and* the complete DECwindows Motif for OpenVMS VAX layered product will not fit on your disk. Appendix G describes some methods that will enable you to install or upgrade to OpenVMS VAX Version 6.2 and DECwindows Motif for OpenVMS VAX on a small capacity system disk.

  Note that you can use the methods described in Appendix G to free up disk space on any system.
- The RZ23 disk cannot be used as an OpenVMS VAX system disk in a DECwindows Motif environment.

For more information, see the *OpenVMS Operating System for VAX and Alpha, Version 6.2* Software Product Description (SPD).

Changes Since OpenVMS Version 6.1

New or changed features include:

- **Software Product Descriptions (SPDs).** The following Software Product Descriptions (SPDs) are now provided on the OpenVMS VAX distribution kit. (Hardcopies of the SPDs are no longer provided.)
  - *DECnet for OpenVMS VAX and Alpha, Version 6.2*
  - *OpenVMS Operating System for VAX and Alpha, Version 6.2*
  - *RMS Journaling for OpenVMS, Version 6.2*
  - *OpenVMS Cluster Software, Version 6.2*
  - *Volume Shadowing for OpenVMS, Version 6.2*

  For information about the location of these SPD files on the distribution kit and how you can obtain them, see the section Locating Files on the Distribution Media.
- **New Save Set.** 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 OpenVMS Management Station optional files, which are used to create the installation media for the PC client software, are contained in the VMS062.G save set.

  For more information, see Appendix F.

Definitions: A Few Key Terms

You should be familiar with the following key terms before performing an installation or upgrade:

Term	Definition
Distribution Media	The media containing the OpenVMS VAX operating system software. This software is supplied in a format that the computer cannot use until you perform an installation or upgrade.
System Disk	The disk that contains (or will contain) the OpenVMS VAX operating system in a usable format. The installation or upgrade procedure converts the OpenVMS VAX operating system software to this usable format when transferring the software from the distribution media 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.

Term	Definition
HSC Drive	A drive connected to a hierarchical storage controller (HSC) device. For example, a magnetic tape drive connected to an HSC device is referred to as an HSC tape drive. The HSC is a self-contained, intelligent, mass storage subsystem that enables VAXcluster nodes to share Digital Storage Architecture (DSA) disks.

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

Locating Files on the Distribution Media

Introduction

The OpenVMS VAX Version 6.2 files are stored on the distribution media as the following save sets:

Save Set Name	Description
VMS062.A	Required
VMS062.B	Required
VMS062.C	Library (optional)
VMS062.D	Optional (optional)
VMS062.E	Help Message (optional)
VMS062.F	OpenVMS manuals (optional)
VMS062.G	OpenVMS Management Station software PC files (optional)

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

On Magnetic Tape

The OpenVMS VAX Version 6.2 magnetic tape kit contains OpenVMS VAX software on three tapes. The first tape contains the required save sets VMS062.A and VMS062.B. The second tape contains the save sets VMS062.C and VMS062.D. The third tape contains save sets VMS062.E, VMS062.F, VMS062.G and the DECwindows base support and workstation support files.

On Tape Cartridges

The OpenVMS VAX Version 6.2 TK50 tape kit contains OpenVMS VAX software on two tape cartridges. The first cartridge contains VMS062.A, VMS062.B, VMS062.C, VMS062.D, VMS062.E, VMS062.F and VMS062.G save sets. The second cartridge contains standalone BACKUP, and DECwindows base support and workstation support files.

On Compact Disc

The OpenVMS VAX Version 6.2 compact disc kit contains all the save sets and DECwindows base and workstation support files on one compact disc. (For more information, see the *OpenVMS Version 6.2 CD–ROM User's Guide*.)

Note that you can install or upgrade the operating system from a local compact disc drive as well as from an InfoServer device.

DECamds and Monitoring Performance History (MPH) Files

The DECamds software is now included as save sets AMDS062.A and AMDS062.B on the OpenVMS VAX Version 6.2 distribution media. The save sets are located on the third magnetic tape volume, on the second tape cartridge, and on the compact disc in the [AMDS062] directory. For more information, see the system management chapter of the *OpenVMS Version 6.2 Release Notes*.

The Monitoring Performance History (MPH) kit is also included on the OpenVMS VAX Version 6.2 distribution media. The MPH kit is located on the third magnetic tape, on the second tape cartridge, and on the compact disc in the [MPH] directory. For more information, see the system management chapter of the *OpenVMS Version 6.2 Release Notes*.

Software Product Descriptions (SPDs)

The following SPD files are located on the second tape cartidge of the TK50 distribution kit and the third tape of the magnetic tape distribution kit. These SPD files have been grouped into an OpenVMS BACKUP save set named VMS062_SPD.BCK. File names with the .PS extention are in PostScript format. File names with the .TXT extention are in plain ASCII text format.

DECNET_SPD.PS DECNET_SPD.TXT	*DECnet for OpenVMS VAX and Alpha, Version 6.2*
OVMS_62_SPD.PS OVMS_62_SPD.TXT	*OpenVMS Operating System for VAX and Alpha, Version 6.2*
RMS_SPD.PS RMS_SPD.TXT	*RMS Journaling for OpenVMS, Version 6.2*
CLUSTER_SPD.PS CLUSTER_SPD.TXT	*OpenVMS Cluster Software, Version 6.2*
VOL_SHAD_SPD.PS VOL_SHAD_SPD.TXT	*Volume Shadowing for OpenVMS, Version 6.2*

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:VMS062_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:VMS062_SPD.BCK/SAVE_SET  *.*;*
```

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

```
$ BACKUP MUAO:VMS062_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:VMS062_SPD.BCK/SAVE_SET/SELECT=OVMS_62_SPD.PS  *.*;*
```

If your distribution kit is on compact disk, the SPD files are located in the [DOCUMENTATION.V062] directory. For information about locating and printing these SPD files, see the *OpenVMS Version 6.2 CD–ROM User's Guide*.

Installation Procedure

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. Some files can be transferred to an alternate disk.

When to Perform an Installation

Use the installation procedure under the following conditions:

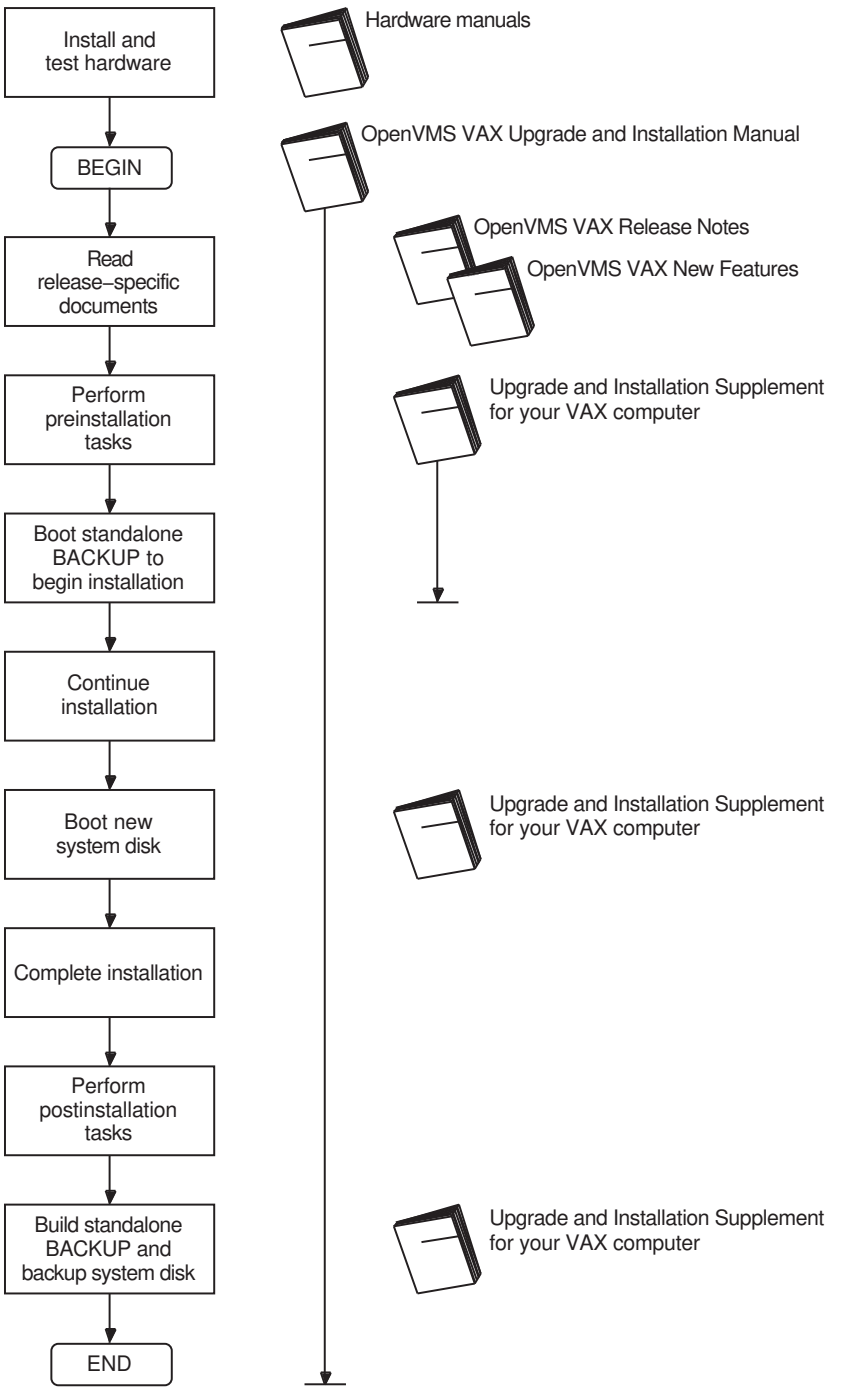
- If your VAX computer is new (it has never had any version of the operating system running on it, including factory-installed software).
- If your VAX computer is running a previous version of the operating system and you want to overwrite the entire contents of the system disk (the OpenVMS VAX operating 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.

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



Upgrade Procedure

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 SYS$COMMON.
- Merges some of the old VMS 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 is done to protect any customizations to the files and results in having two versions of the file when the upgrade is completed. For more information, see Appendix E.
- Cleans up files and structures used only during the upgrade.
- Leaves your VMS license and System Integrated Product (SIP) licenses intact.

  You do not need to reinstall these licenses after you upgrade. (See Appendix A for detailed information about license management for OpenVMS VAX Version 6.2.)

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.

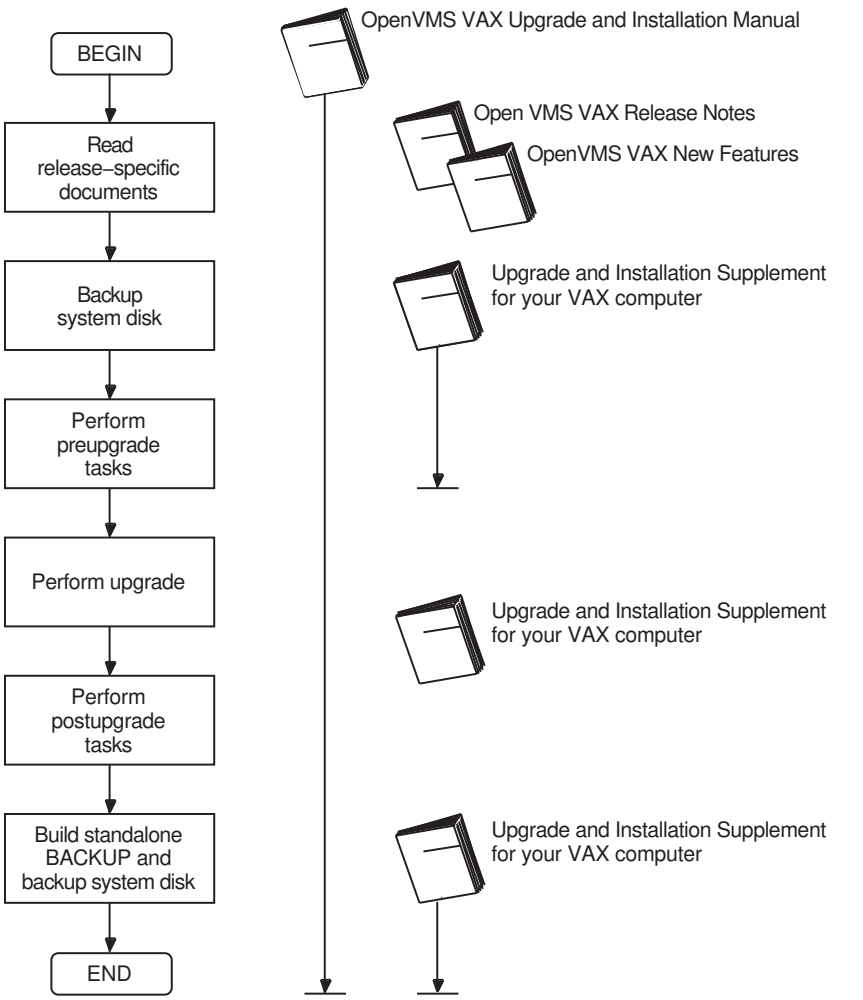
Restrictions

The upgrade procedure will not work correctly if you have changed the names of system directories on your system disk. Restore your system disk to a standard directory structure before attempting an upgrade.

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



Where to Go Next

If you are installing the OpenVMS VAX operating system, go to Chapter 2.

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

2

Before Installing OpenVMS VAX Software

Overview

This chapter describes how to prepare for installing the OpenVMS VAX Version 6.2 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 C2 system
- 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.

Cautions and Restrictions

Introduction

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

Cautions

- 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 will produce 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.

Restrictions

- 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 will display 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 6.2, you must purchase and install the VMS DECwindows Motif Version 1.1, or higher, layered product. (Note that, for versions higher than 1.1, the name of the layered product is DECwindows Motif for OpenVMS.)

Are You Ready to Install?

Introduction

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

Hardware Components

Examine your hardware for the following:

- Make sure the hardware has been installed and checked for proper operation. For detailed information about the hardware, see the hardware manual for your VAX computer.
- Make sure you know how to turn on and operate your system components, including the system unit, console, monitor, drives, terminals, and printers. If necessary, read the 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. If you do not do this, the screen messages will be lost. You will need a transcript in case there is a problem during the installation. For more information, see the upgrade and installation supplement for your computer.

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 VAX distribution kit. If your kit is incomplete, notify Digital Software Supply, and request priority shipment of any missing items.
- Before installing the OpenVMS VAX operating system, review Appendix A of this manual for license management information, the (*OpenVMS Version 6.2 New Features Manual*, the *OpenVMS Version 6.2 Release Notes*, and any cover letters included with your kit.
- Read the Before Installing OpenVMS section in the upgrade and installation supplement for your VAX computer, which describes tasks specific to your VAX computer that you must complete before beginning the installation.

Preparing for an Installation

Introduction

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.

Preparing for a C2 System

Many of the security features provided by the OpenVMS VAX operating system are directed toward the criteria for a C2 system, as defined in the *Department of Defense Trusted Computer System Evaluation Criteria*, published by the U.S. Department of Defense Computer Security Center (DOD 5200.28-STD).

A C2 system is the shipped system that has been configured according to the guidelines in Appendix C of the *OpenVMS Guide to System Security*. Before installing OpenVMS VAX, become familiar with the requirements for operating an OpenVMS VAX system within the C2 framework.

Preparing for a VAXcluster Environment

If you are installing the OpenVMS VAX operating system in a VAXcluster environment, the installation procedure will ask you for information about your VAXcluster environment. Before proceeding, review *VMScluster Systems for OpenVMS*, which provides the information you will 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, see *VMScluster Systems for OpenVMS*.

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— CI (Computer Interconnect), Ethernet, DSSI (DIGITAL Storage Systems Interconnect), 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. See the *DECnet for OpenVMS Guide to Networking* for more information.

(continued on next page)

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

Information You Need	How to Get It
Allocation class value	During the installation procedure you will be 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 *VMScluster Systems for OpenVMS* 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 that is connected to a dual-pathed disk. When you enter the allocation class value, the installation procedure uses it to automatically set the value of the system parameter ALLOCLASS.
Quorum disk	See *VMScluster Systems for OpenVMS* to determine whether you want a quorum disk in the cluster.
Location for page and swap files	See *VMScluster Systems for OpenVMS* 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 *VMScluster Systems for OpenVMS*.
Cluster group number and cluster password	Needed 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 (_).

Preparing Tape and Disk Drives

Prepare your tape and disk drives using the following steps:

1. Decide which drive will hold the distribution tape and which drive will hold the system disk. Determine the device names for each drive, and write these names on a piece of paper. 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 a hierarchical storage controller (HSC). Otherwise, go to step 3.

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

   a. Press Ctrl/C at the HSC console terminal.

   b. Enter the following command at the HSC> prompt and press Return:

      ```
      HSC> SHOW SYSTEM
      ```

      The information displayed includes the name of the HSC. For example:

      ```
      22-JUN-1995 15:00:00.00 Boot:12-JUN-1995 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, see the *HSC 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.

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	If you are installing a standalone system, you will be prompted to supply an SCSNODE name and an SCSSYSTEMID. The SCSNODE name must be a 1- to 6-character unique DECnet node name. The SCSSYSTEMID system parameter is calculated as follows: (DECnet area * 1024) + node number Note that, if you are installing the operating system in a VAXcluster environment, the installation procedure does not prompt you to supply these parameters. It calculates the SCSNODE and SCSSYSTEMID based on the DECnet node name and node address that you supply earlier in the procedure.
Optional components	The installation procedure prompts you to specify whether you want to install the *library* (VMS062.C) and *optional* (VMS062.D) components. Appendix C lists the files included in these components. You can save some space on your system disk if you choose *not* to install these components, but be sure to review Appendix C before deciding.
Location for Help Message utility and online manuals	Save set VMS062.E (8900 blocks) contains the online Help Message utility, and VMS062.F (6200 blocks) contains three online reference manuals in ASCII format: *OpenVMS Master Index*, *OpenVMS Glossary*, and *Overview of OpenVMS Documentation*. Know the name of the disk on which you will be installing these save sets. You can install these save sets on your system disk or on alternate disks. (However, if you copied the distribution kit to some other media from which you will be performing the installation, you cannot install these save sets on that media.) Save set VMS062.E can reside on one alternate disk, and save set VMS062.F can reside on another. However, you cannot divide the text files in save set VMS062.F between disks; they must all be on the same disk.

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. VMS DECwindows Motif Version 1.1 is the minimum supported version for systems running OpenVMS VAX Version 6.2. 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:** 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 Version 6.2 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.

Preinstallation Checklist

Introduction

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

Did You . . .

- ☐ 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 A of this manual, the *OpenVMS Version 6.2 New Features Manual*, the *OpenVMS Version 6.2 Release Notes*, and any cover letters included with your kit?
- ☐ Read the section Preparing for a C2 System for special considerations about running the OpenVMS VAX operating system in a C2 environment if you intend to create a C2 compliant environment?
- ☐ 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 *VMScluster Systems for OpenVMS*.)

  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 the section Preparing Tape and Disk Drives.)

☐ Make sure you have the following information (described in the section Information You Need During the Installation) 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?

Where to Go Next

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

Overview

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.

The following installation tasks are described in this chapter:

- Booting standalone BACKUP
- Creating the system disk
- Joining a VAXcluster configuration
- 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 your VAX computer.

Booting Standalone BACKUP

Introduction

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.

Where to Find Standalone BACKUP

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

Booting from Tape Cartridge

If your distribution media is tape cartridges, complete the following steps to boot standalone BACKUP. (If you are using an InfoServer device, go to Booting from an InfoServer Device.)

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:

```
%BACKUP-I-IDENT, standalone BACKUP V6.1; the date is 22-JUN-1995 15:00
$
```

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 *VMS062 BIN TK50 1/2 VMS BINARY*.

Where to Go Next

After you have booted standalone BACKUP, go to the section Creating the System Disk.

Booting from an InfoServer Device

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:

```
>>> 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 ISL (initial system load) boot program instead of a virtual memory boot (VMB) program. Select one of the two files as follows:

   - ISL_SVAX_062
   - ISL_LVAX_062

   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_062	ESA0 (LANCE), XQA0 (DELQA)
VAX 4000	ISL_SVAX_062	EZA0 (SGEC), XQA0 (DELQA)
VAX 6000	ISL_LVAX_062	EXA0 (DEMNA), FXA0 (DEMFA), ETA0 (DEBNI) (DEBNA)
VAX 7000	ISL_LVAX_062	EXA0 (DEMNA), FXA0 (DEMFA)
VAX 10000	ISL_LVAX_062	EXA0 (DEMNA), FXA0 (DEMFA)
MicroVAX	ISL_SVAX_062	ESA0 (LANCE), XQA0 (DELQA)
VAXstation	ISL_SVAX_062	ESA0 (LANCE)
VAXft 110, 310, 410, 610, and 612	ISL_SVAX_062	EPA0 (LANCE)

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

```
Loading system software.

Filename: ISL_LVAX_062
```

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

```
  Network Initial System Load Function
  Version 1.1

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

   Enter a function ID value:
```

   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 V6.1; the date is 22-JUN-1995 15:00
$
```

Where to Go Next

Once you have booted standalone BACKUP, go to the section Creating the System Disk.

Creating the System Disk

Overview

This section describes the steps for transferring the OpenVMS VAX files from the distribution media to your system disk or, for certain files, to an alternate disk.

To transfer the OpenVMS VAX files from the distribution kit to your system disk, perform the following steps:

Step 1: Determine 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 the section Preparing Tape and Disk Drives 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.

Step 2: Load 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, insert the first piece of media in the *source-drive.* For example, if you have a TK50 tape cartridge kit, make sure the first tape is in the *source-drive.*

If you are installing from a compact disc, it is already in the drive.

Step 3: Transfer VMS062.B to Your System Disk

Enter a BACKUP command in the following format to transfer the VMS062.B save set to your system disk:

```
$ BACKUP/IMAGE/VERIFY [hsc-name]source-drive:VMS062.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 VMS062.

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 the Return key:

```
$ BACKUP/IMAGE/VERIFY MUA0:VMS062.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:VMS062.B/SAVE_SET YOURS$DUA1:
```

The procedure transfers the VMS062.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 VMS062.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]VMS062.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 online 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 Step 2. Then type Yes, press Return, and repeat this step.

When standalone BACKUP has completed checking files, the procedure displays the following message:

```
%BACKUP-I-PROCDONE, Operation completed. Processing finished at 22-JUN-1995  15:00.
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 online and ready.
Enter "YES" to continue:
```

Step 4: Boot 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.

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

For example:

```
OpenVMS VAX Version 6.2 Major version id = 1 Minor version id = 0

                  OpenVMS VAX V6.2 Installation Procedure

                           Model: VAXserver 3600 Series
                     System device: RA82 - _DUA8
                       Free blocks: 1170940
                          CPU type: 10-01

* Please enter the date and time (DD-MMM-YYYY HH:MM):22-JUN-1995 15:00

STDRV-I-STARTUP, VMS startup begun at 22-JUN-1995 15:00:00.59
%SET-I-NEWAUDSERV, identification of new audit server process is 00000028
  .
  .
  .
%%%%%%%%%%  OPCOM  22-JUN-1995 15:00:15.46  %%%%%%%%%%
Message from user JOB_CONTROL on POKIPC
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT

%%%%%%%%%%  OPCOM  22-JUN-1995 15:00:15.41  %%%%%%%%%%
Message from user JOB_CONTROL on POKIPC
-SYSTEM-W-NOSUCHFILE, no such file

LICENSE-F-EMTLDB, license database contains no license records
%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...

%STDRV-I-STARTUP, VMS startup begun at 22-JUN-1995 15:03:00.00
```

Note: The procedure 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.

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

Step 5: Specify 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 the Return key to accept the default volume label, OpenVMS062, 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 OpenVMS062, just press the Return key in
response to the next question.

* Enter the volume label for this system disk [OpenVMS062]: SYSDSK1
```

Step 6: Specify 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 the name of the drive holding the OpenVMS distribution media: MUA0
* Is the OpenVMS media ready to be mounted? [N] YES
%MOUNT-I-MOUNTED, VMS062       mounted on _MUA0:
```

If you are not using the InfoServer, continue to Step 7: Select Optional OpenVMS Components.

If you are using an InfoServer, enter DAD1:.

```
* Enter the volume label for this system disk [OpenVMS062]: SYSDSK1
* Enter name of drive holding the OpenVMS distribution media: DAD1:
```

The procedure then prompts you to:

```
* Enter the InfoServer service name [VAXVMS062]:
* Enter the InfoServer work group number [0]:
```

Press the Return key 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 (refer to the section Booting Standalone BACKUP). 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, VMS062     mounted on _DAD1:
```

Step 7: Select 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                              -  43500 blocks
o OpenVMS optional                             -  19100 blocks
o OpenVMS Help Message                         -   8850 blocks
o Text versions of three OpenVMS manuals       -   4450 blocks
o DECwindows workstation support               -  25750 blocks
o DECwindows base support                      -   3600 blocks
o OpenVMS Management Station                   -   5900 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: 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 and the three OpenVMS manuals can be tailored on to the system disk only. If you do not choose them 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 on an alternate disk *after* the installation procedure completes, you can use the BACKUP command, as follows:

```
BACKUP/VERIFY source-device:[000000]VMS062.F/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. (To install the OpenVMS manuals, specify *VMS062.E/SAVE_SET* in place of *VMS062.F/SAVE_SET*.)

Also note that, for TK50 tape 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.

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 VMS062.C save set are listed in Appendix C. If you want to install the VMS062.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 VMS062.C files, type N (for NO) and press Return.

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 VMS062.D save set are listed in Appendix C. If you want to install the VMS062.D files, type Y and press Return. If you do *not* want to install the VMS062.D files, type N and press Return.

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 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.

   Note: To use the OpenVMS Management Station on your PC, you must be
   running Digital's PATHWORKS V5.0A for DOS and Windows (or V5.1) software.

   The OpenVMS Management Station optional files consume approximately 5900
   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:     623240 blocks
```

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 F to prepare your OpenVMS system and your PC to run the OpenVMS Management Station server and client software.

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 8850 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
```

OpenVMS Manuals

The procedure displays the following message:

```
You have the choice of installing the text version of one or more
OpenVMS manuals:

o OpenVMS Master Index                        -   3600 blocks
o OpenVMS Master Glossary                     -    650 blocks
o Overview of OpenVMS Documentation           -    200 blocks

You can install these manuals, by default, to your system disk
in [SYSHLP.VMSDOC], or to an alternate device of your choice.
In either case, all manuals must reside on the same device.
If you choose an alternate device and do not specify a directory,
[VMSDOC_TEXT] will be created for you.  The device structure
for the alternate device should resemble the following:

                    device:[directory]

Do you want any of these three OpenVMS manuals?: (Y/N)
```

Type Y to install all three manuals or to install a subset of the manuals.

The following message is displayed:

```
Do you want all three OpenVMS manuals? (Y/N)
```

To install all three manuals, type Y. To install a subset, type N and the system will display each manual title and prompt you to type either Y or N to select it.

When you have completed selecting which manuals to install, the following prompt is displayed:

```
* Where do you want to install the OpenVMS manual(s)? [SYSHLP.VMSDOC]
```

Press Return to accept the default, [SYSHLP.VMSDOC] on the system disk, or enter the alternate disk name and press Return.

Step 8: Choose DECwindows Support Options

Next, the procedure displays messages about the DECwindows components shipped with OpenVMS VAX Version 6.2.

Important: 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 VAX (previously called VMS DECwindows Motif) layered product, which supports both Motif and XUI environments.

Note: 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.

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 provide DECwindows
    options now and tailor off unwanted files later.

    You can install all of the DECwindows components provided in
    this kit, which requires approximately 29350 blocks, or you
    can select specific components.

    o DECwindows workstation support             -  20750 blocks
      -  75 dots per inch video fonts (included)
      - 100 dots per inch video fonts (optional) -   5000 blocks
    o DECwindows base support                    -   3600 blocks

    If you are installing this kit on a workstation or on a VAXcluster
    that contains workstations, then you must choose the DECwindows
    workstation support option.

    If you are installing this kit on a system that does not include
    workstations but does include Xterminals, then you might want to
    choose the DECwindows workstation support option to provide font
    files.  If you decide not to select the DECwindows workstation
    support option at this time, then you will have to use the
    DECW$TAILOR utility to provide font files for the Xterminals.

    If you plan to run DECwindows software, then you must choose the
    DECwindows base support option.

    NOTE: This kit does NOT contain full DECwindows support. It includes
          only the DECwindows base and workstation support components.
          To obtain full DECwindows support, you must also install the
          separate DECwindows Motif for OpenVMS VAX layered product.

    NOTE: VMS DECwindows Motif Version 1.1 is the minimum version that
          can be used with OpenVMS VAX Version 6.2.

* Do you want to provide optional DECwindows support? (Y/N)
```

Before You Decide

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 that contains workstations or Xterminals	DECwindows workstation support.
Are installing on a workstation or on a VAXcluster that includes workstations or Xterminals	DECwindows workstation support.
Have a workstation monitor capable of displaying 100 dots/inch (for example, a VR150, VR160, or VR295)	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.

If you *do not* want to install DECwindows support, type N, press Return, and go to the next step.

If you want to install DECwindows support, type Y and press Return. The procedure displays the following message:

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

If you answer Yes to this prompt, the following DECwindows components will be installed:

- DECwindows workstation support
- DECwindows base support
- 75 dots/inch video fonts

You are also given the option to select the 100 dots/inch video fonts.

If you decide not to install the DECwindows workstation support, you are given the option to select the DECwindows base support, which is required if you plan to run any DECwindows software.

```
* Do you want to install DECwindows base support? (Y/N)
```

Step 9: Verify 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.

Step 10: Install OpenVMS Options

If you answer Yes to the prompt in Step 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 will vary, depending on whether your distribution kit is on tape cartridges, compact disc, or magnetic tapes.

Tape Cartridges or Compact Disc—If your distribution kit is on tape cartridges or compact disc and you elected to install the VMS062.C, VMS062.D, VMS062.E, and VMS062.F save sets, the procedure displays the following messages:

```
Restoring OpenVMS library save set ...
%BACKUP-I-STARTVERIFY, starting verification pass

Restoring OpenVMS optional save set ...
%BACKUP-I-STARTVERIFY, starting verification pass

Restoring OpenVMS Help Message save set ...
%BACKUP-I-STARTVERIFY, starting verification pass

Restoring OpenVMS manuals save set ...
%BACKUP-I-STARTVERIFY, starting verification pass
```

Magnetic tapes—If your distribution media is magnetic tape, you must mount tape 2 of the distribution kit. The procedure then begins restoring the VMS062.C and VMS062.D save sets, if you elected to install them, and displays the following messages:

```
Restoring OpenVMS library save set ...
%BACKUP-I-STARTVERIFY, starting verification pass

Restoring OpenVMS optional save set ...
%BACKUP-I-STARTVERIFY, starting verification pass
```

The procedure now prompts you to mount the third tape. After you mount the third tape, the procedure begins restoring the VMS062.E and VMS062.F save sets, if you elected to install them, and displays the following messages:

```
Restoring OpenVMS Help Message save set ...
%BACKUP-I-STARTVERIFY, starting verification pass

Restoring OpenVMS manuals save set ...
%BACKUP-I-STARTVERIFY, starting verification pass
```

Where to Go Next

If you are installing DECwindows support software, go to Step 11: Install DECwindows Support Software.

If you are not installing DECwindows support software, go to the section Joining a VAXcluster Environment.

Step 11: Install DECwindows Support Software

If you are installing from magnetic tape or compact disc, the distribution media containing the DECwindows support files is already loaded on your source drive.

If you are installing from tape cartridges, remove the tape that contains the OpenVMS VAX operating system from the source drive when you see a message similar to the following:

```
You can now remove the OpenVMS distribution kit from MUA0:.

Load the DECwindows distribution kit.
```

Put the second tape cartridge, which contains the DECwindows support files, in the source drive. (Note that you are *not* loading the DECwindows Motif for OpenVMS layered product at this time.)

When prompted, type the device name of the source drive and press Return. For example:

```
* Enter name of the drive holding the DECwindows distribution media: MUA0
* Is the DECwindows media ready to be mounted? [N] YES
```

The procedure installs the DECwindows options that you specified and displays messages similar to the following:

```
%MOUNT-I-MOUNTED, DEC062 mounted on _MUA0:

    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

    Restoring DECwindows 100 dots per inch fonts save set ...
%BACKUP-I-STARTVERIFY, starting verification pass
```

Note : The DECwindows support files are listed in Appendix D. 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.

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

```
You can now remove the DECwindows distribution kit from MUA0:.
```

Remove the distribution media from the drive.

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

Joining a VAXcluster Environment

Introduction

The installation procedure now asks whether you are installing the OpenVMS VAX operating system in a VAXcluster or standalone environment. If you are installing in a VAXcluster environment, the procedure asks a series of questions about your configuration. Refer to *VMScluster Systems for OpenVMS* to get the information you need to answer these questions.

VAXcluster or Standalone?

The procedure displays the following messages:

```
Creating [VMS$COMMON] directory tree

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

* Will this node be a cluster member? (Y/N)
```

If you are installing a ...	Then ...
Standalone system	Do the following: 1. Type N and press Return. 2. If you selected DECwindows workstation support, the procedure asks you if you want DECwindows Motif as your default windowing system. Type Y or N and press Return. 3. Go to the section Setting Passwords and SCSNODE and SCSSYSTEMID Parameters.
VAXcluster system	Do the following: 1. Type Y and press Return. 2. Make sure you have a VAXcluster license PAK for each node in the VAXcluster. 3. Go to the next step.

Determine the Type of VAXcluster

If you answered Yes to the previous question, the procedure displays the following message:

```
Now configuring system to be a cluster member.
```

The installation procedure then displays several questions about the configuration of your VAXcluster. Your answers to these questions depend on whether you want to install a CI-only, local area, FDDI, DSSI, or mixed interconnect VAXcluster. Before answering these questions, you must determine which type of VAXcluster you want to install. For a complete description of VAXcluster types, see *VMScluster Systems for OpenVMS*.

CI-Only VAXcluster

Table 3–1 lists the questions you are asked if you want a CI-only VAXcluster and explains the typical responses.

Table 3–1 Installation Questions for CI-Only VAXcluster

Question	How to Respond
Will this node be a cluster member (Y/N)?	Enter Y.
What is the node's DECnet node name?	Enter the unique DECnet node name—for example, KRUP. The DECnet node name can be from 1 to 6 alphanumeric characters in length and cannot include dollar signs or underscores.
What is the node's DECnet node address?	Enter the unique DECnet node address—for example, 2.2.
Will the Ethernet be used for cluster communications (Y/N)?	Enter N. A CI-only VAXcluster does not use the Ethernet for cluster communications.
Will be a disk server (Y/N)?	Enter Y if you want local disks to be served to the cluster. If you enter Y, the procedure will ask if the node will serve HSC disks. Enter N to this second question. HSC disks are available to all nodes in a CI-cluster. Refer to *VMScluster Systems for OpenVMS* for information on served cluster disks.
Enter a value for KRUP's ALLOCLASS parameter:	If the system includes a dual-ported disk, enter the appropriate allocation class value (it must be a value between 1 and 255). Otherwise, enter 0. For information on selecting the ALLOCLASS parameter, see *VMScluster Systems for OpenVMS*.

(continued on next page)

Table 3–1 (Cont.) Installation Questions for CI-Only VAXcluster

Question	How to Respond
Does this cluster contain a quorum disk (Y/N)?	Enter Y or N, depending on your configuration. If you enter Y, the procedure asks for the name of the quorum disk. Enter the device name of the quorum disk. Refer to *VMScluster Systems for OpenVMS* for information about quorum disks.

Local Area and Mixed-Interconnect VAXcluster

Table 3–2 lists the questions you are asked if you want a local area VAXcluster or a mixed-interconnect VAXcluster and explains the typical responses.

Table 3–2 Installation Questions for Local Area and Mixed-Interconnect VAXcluster Environments

Question	How to Respond
Will this node be a cluster member (Y/N)?	Enter Y.
What is the node's DECnet node name?	Enter the unique DECnet node name—for example, KRUP. The DECnet node name can be from 1 to 6 alphanumeric characters in length and cannot include dollar signs or underscores.
What is the node's DECnet node address?	Enter the unique DECnet node address—for example, 2.2.
Will the Ethernet be used for cluster communications (Y/N)?	Enter Y. The Ethernet is required for cluster (SCS internode) communications in local area and mixed-interconnect VAXcluster systems.
Enter this cluster's group number:	Enter a number in the range from 1 to 4095 or 61440 to 65535.
Enter this cluster's password:	Enter the cluster password. The password must be from 1 to 31 alphanumeric characters in length and can include dollar signs and underscores. (The password is not displayed while you enter it.)
Reenter this cluster's password for verification:	Reenter the password.

(continued on next page)

Table 3–2 (Cont.) Installation Questions for Local Area and Mixed-Interconnect VAXcluster Environments

Question	How to Respond
Will be a disk server (Y/N)?	Enter Y. In local area and mixed-interconnect VAXcluster systems, the system disk is always served to the cluster. Refer to *VMScluster Systems for OpenVMS* for information on served cluster disks.
Will KRUP serve HSC disks (Y/N)?	Enter a response appropriate for your configuration.
Enter a value for KRUP's ALLOCLASS parameter:	Enter the appropriate allocation class value. If you have a mixed-interconnect VAXcluster, the value must be between 1 and 255; you cannot enter 0.
Does this cluster contain a quorum disk (Y/N)?	Enter Y or N, depending on your configuration. If you enter Y, the procedure asks for the name of the quorum disk. Enter the device name of the quorum disk. Refer to *VMScluster Systems for OpenVMS* for information on quorum disks.

Setting Passwords and SCSNODE and SCSSYSTEMID Parameters

Introduction

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.

How to Enter Passwords

When setting the passwords, remember:

- Passwords must be 8 characters or more.
- Passwords are not displayed by the system while you are entering them.
- Press Return after you enter each password.
- Each password is verified.

Use the following procedure to set passwords:

1. Supply the passwords when prompted by the installation procedure, as follows:

```
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
```

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

   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-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.
```

3. 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
```

4. 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
      .
      .
      .
```

Entering SCSNODE and SCSSYSTEMID Parameters

If you are installing a standalone system, 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.

If you are installing the operating system in a VAXcluster environment, you are not prompted to supply these parameters. The procedure calculates these parameters using the DECnet node name and node address you supplied earlier in the procedure.

Postinstallation Tasks Described

Introduction

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

Important: Note that you do not perform these tasks now but *after* the installation completes.

Sample Message

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 with the HELP and LINK commands.

o BUILD A STANDALONE BACKUP KIT - You can build a standalone backup kit
using the procedure described in 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 device.
```

For more information about decompressing the system libraries, see the section Decompressing System Libraries 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 V6.2 installation procedure.

   Configuring all devices on the system...

  You can safely ignore the following NCP error messages.

%NCP-W-UNRCMP, Unrecognized component , Object
```

Where to Go Next

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

Registering Licenses

Introduction

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

How to Register Your Licenses

You must register your licenses in the following order:

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.

Where to Find More Information

For more information about registering licenses, see 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 A of this manual for notes and supplemental information concerning licenses

Types of 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 VAX VMS licenses include the rights for the Rdb/VMS Run-Time Option for OpenVMS VAX. This allows you to run an application developed using Rdb/VMS for OpenVMS VAX software. However, Rdb/VMS for OpenVMS VAX has separate media and documentation. In addition, if you want to perform Rdb development, you must purchase a separate license. (Refer to SPD 25.59.xx for more information.)

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.
Multiuser License	Provides use according to a specified number of concurrent users. This is an activity-based license. The Multiuser 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 into 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 Multiuser License can be increased by the addition of the OpenVMS VAX Interactive User License[1] for one or more users. For more information, refer to the description of the OpenVMS VAX Interactive User License later in this table.

[1]The OpenVMS VAX Interactive 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
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 Interactive User License[1] for one or more users. For more information, refer to the description of the OpenVMS VAX Interactive User License later in this table.
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 Interactive User License[1] for one or more users. For more information, refer to the description of the OpenVMS VAX Interactive 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. The OpenVMS VAX O/S Base License does not include the license right for the Rdb/VMS Run-Time Option for OpenVMS VAX. The Rdb/VMS for OpenVMS VAX Run-Time License is available separately. Interactive use of systems licensed with an OpenVMS VAX O/S Base License requires the addition of an OpenVMS VAX Interactive User License[1] for one or more users.

[1]The OpenVMS VAX Interactive 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.

Type of License	Description
	OpenVMS VAX Licenses
OpenVMS VAX Interactive 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 Interactive User License.

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

How to Register OpenVMS VAX 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. See the *OpenVMS License Management Utility Manual* for detailed information.

The installation procedure 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)
```

If you choose ...	Then ...
Not to register the licenses at this time	Do the following: 1. Type N and press Return. 2. Go to the section Running AUTOGEN. 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.

Beginning the Licensing Procedure

By typing Y (Yes) to register your licenses now, you invoke 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]
```

Select the appropriate options (beginning with 1, as shown) until you have successfully registered all required PAKs.

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)
- DECnet for OpenVMS

  There are two DECnet for OpenVMS licenses:

  - 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 DECnet for OpenVMS.

    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, see the *OpenVMS License Management Utility Manual*.

- 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.

Where to Go Next

To complete the installation procedure, continue on to the next section, Running AUTOGEN.

Running AUTOGEN

Introduction

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

How AUTOGEN Works

The installation procedure runs AUTOGEN, as follows:

1. The installation procedure displays a series of messages similar to the following:

```
   Running AUTOGEN to compute 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, see the *OpenVMS System Manager's Manual: Essentials*.

2. After AUTOGEN finishes, the procedure displays a series of shutdown messages that begin 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
```

3. After the system shuts down, the procedure tries to reboot the new system disk. If the system does not reboot automatically, reboot it manually.

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

```
>>> B DUA1
```

   For information on booting, refer to the upgrade and installation supplement for your VAX computer. Then return to this manual.

4. After the system reboots, the procedure displays the following message:

```
 OpenVMS VAX Version V6.2 Major version id = 1 Minor version id = 0
************************************************************

OpenVMS VAX V6.2

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.

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

Note: If you did not register your OpenVMS VAX license as described in the section Registering Licenses, 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 A and the *OpenVMS License Management Utility Manual*.

Finally, the procedure displays informational messages and accounting information. For example:

```
%SET-I-INTSET, login interactive limit = 64, current interactive value = 0
  SYSTEM       job terminated at 22-JUN-1995 15:37:04.00

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 00:00:55.33   Elapsed time:       0 00:01:31.24
```

At this point the OpenVMS VAX operating system is running.

5. Press the Return key. The system asks you for the user name and password. Log into the SYSTEM account so you can perform certain postinstallation tasks. For example:

```
     Welcome to OpenVMS VAX V6.2

Username: SYSTEM
Password:
     .
     .
     .
     Welcome to OpenVMS VAX Version V6.2
```

If you forget the password, follow the instructions for performing an emergency startup in the *OpenVMS System Manager's Manual: Essentials*.

6. There are several postinstallation tasks you must perform before you can use the system. These tasks are described in Chapter 4.

4

After Installing OpenVMS VAX

Overview

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 DECnet for OpenVMS
- Testing the system
- Decompressing system libraries
- Removing unwanted files
- 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 less-experienced system manager, you should read the entire chapter and then use the checklist to make sure you have completed all the postinstallation tasks.

Verifying System Time

Introduction

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.

How to Reset System 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=22-JUN-1995:18:35:30
```

Compensating for Time Zones

If your system communicates with systems in other time zones, you can use the time conversion service and the Coordinated Universal Time (UTC) system services to compensate for differences in time stamps because of differing time zones. For more information, see the *OpenVMS System Manager's Manual: Essentials*.

Registering Your Licenses

Background

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 also register the licenses for any of the following System Integrated Products you have purchased:

VAXcluster
DECnet for OpenVMS
OpenVMS RMS Journaling
Volume Shadowing for OpenVMS

Where to Find More Information

For step-by-step instructions about registering licenses, see the *OpenVMS License Management Utility Manual* and Appendix A of this manual, which provides supplemental information.

Backing Up Your System Disk

Background

Now that you have spent time installing the operating system, you should protect your work by making a backup copy of the system disk in case you have any problems while customizing it. Digital 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

You should also back up your system disk after you have customized it.

Where to Find More Information

For complete information about these operations, see the upgrade and installation supplement for your VAX computer.

Customizing the System

Background

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

Where to Find More Information

For instructions about customizing your system, refer to the following:

- Read 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, read *VMScluster Systems for OpenVMS* for further information about setting up a cluster.
- Read the *OpenVMS System Manager's Manual: Essentials* for instructions on customizing and using your system. You will find 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, see the *VMScluster Systems for OpenVMS* for additional instructions.)
  - Setting up user accounts
  - Adjusting system parameters
- If you plan to use either the DECnet–VAX product included on the OpenVMS VAX Version 6.2 kit or the DECnet/OSI for OpenVMS layered product, read the section Configuring and Starting DECnet and perform the steps described there. If you are installing the DECnet/OSI for OpenVMS layered product, you should also refer to the DECnet/OSI 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 Digital

  See Chapter 9 for complete instructions for customizing your DECwindows support software.

- If you installed the optional OpenVMS Management Station files, see Appendix F for information about preparing your OpenVMS system and your PC to use this application.

Configuring and Starting DECnet

Introduction

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

You can use the DECnet for OpenVMS (Phase IV) software included on the OpenVMS VAX Version 6.2 kit, or you can install the DECnet/OSI (Phase V) layered product.

Both of these products require that you run a configuration procedure to configure the network. If you choose to run DECnet for OpenVMS, you must also edit your system startup file as described in the section Edit SYSTARTUP_VMS.

Configure Your System

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

- For the DECnet for OpenVMS layered product, run SYS$MANAGER:NETCONFIG.COM. (See the *DECnet for OpenVMS Guide to Networking* for more information.)
- For the DECnet/OSI for OpenVMS layered product, run SYS$MANAGER:NET$CONFIGURE.COM. (See the *DECnet/OSI for OpenVMS Installation and Configuration* for more information.

Edit SYSTARTUP_VMS

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

If you plan to run DECnet for OpenVMS (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 your system is booted. 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 for OpenVMS 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 for OpenVMS or have not yet started it, this command tells DECwindows not to wait for DECnet.

Testing the System with UETP Software

Background

UETP software is a user environment test package that tests whether the OpenVMS VAX operating system is installed correctly. As part of the postinstallation procedure, you should run UETP to verify your 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 VMS062.D. If you did not install the optional save set, you can add the UETP files to your system using VMSTAILOR.

Where to Find More Information

For information about using VMSTAILOR see Chapter 10.

For complete information about UETP, see the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*.

Decompressing System Libraries

Background

Decompressing the system libraries gives the system faster access to them. You can decompress all the system libraries or just some of them. Table 4–1 gives the 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		

The additional amount of disk space required to decompress all the system libraries is about 13,500 blocks. To find out how much disk space you have, enter the following command and press the Return key:

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

How to Decompress Libraries

To decompress the system libraries, you run LIBDECOMP.COM by logging into the SYSTEM account, entering the following command, and pressing Return:

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

The following information is displayed:

```
          VMS Library Decompression Utility

   Options:

    1  HELPLIB.HLB          13  DBG$UIHELP.HLB       25  PATCHHELP.HLB
    2  STARLET.OLB          14  DBG$HELP.HLB         26  PHONEHELP.HLB
    3  VAXCCURSE.OLB        15  EXCHNGHLP.HLB        27  SDA.HLB
    4  VAXCRTL.OLB          16  NCPHELP.HLB          28  SHWCLHELP.HLB
    5  VAXCRTLG.OLB         17  ANLRMSHLP.HLB        29  SYSGEN.HLB
    6  DECCCURSE.OLB        18  DISKQUOTA.HLB        30  TECO.HLB
    7  DECCRTL.OLB          19  EDFHLP.HLB           31  UAFHELP.HLB
    8  DECCRTLG.OLB         20  TPUHELP.HLB          32  EVE$HELP.HLB
    9  ERFLIB.TLB           21  ACLEDT.HLB           33  EVE$KEYHELP.HLB
   10  STARLETSD.TLB        22  INSTALHLP.HLB        34  STARLET.MLB
   11  MAILHELP.HLB         23  LATCP$HELP.HLB       35  LIB.MLB
   12  EDTHELP.HLB          24  MNRHELP.HLB

   or    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.

Removing or Adding OpenVMS Files

Background

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

Note: You cannot use VMSTAILOR to remove files installed on an alternate device from save sets VMS062.E or VMS062.F.

Where to Find More Information

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

Backing Up the Customized System Disk

Background

Now that you have spent time installing and customizing the operating system, protect your work by making a standalone backup copy of the system disk.

Where to Find More Information

For complete information about these operations, see the upgrade and installation supplement for your VAX computer. Once you have made a standalone backup copy of the system disk, install any software products that you want to run on your system. Follow the directions given in the software product installation manuals.

Running AUTOGEN

Background

When you installed 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, it uses the parameter values in SYS$SYSTEM:MODPARAMS.DAT. Note that hard-coded values in MODPARAMS.DAT affect AUTOGEN's calculations of the feedback parameters. For AUTOGEN to properly calculate minimum default values, you should replace the hard-coded 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 hard-coded values in MODPARAMS.DAT.

For information about using AUTOGEN, see the *OpenVMS System Manager's Manual: Essentials*.

When to Run AUTOGEN

After installing 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 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, see the upgrade and installation supplement for your computer.
3. Digital 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.

What to Do Next

After you run AUTOGEN following the first 24 hours of system operation (step 1), use the Postinstallation Checklist to make sure you have completed all the tasks described in this chapter.

Postinstallation Checklist

Introduction

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

Did You . . .

- ☐ Verify the system time? (Described in Verifying System Time.)
- ☐ Register your licenses if you did not do so during the installation procedure? (Described in Appendix A 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 the section Customizing the System.)
- ☐ Configure and start DECnet for OpenVMS? (Described in the section Configuring and Starting DECnet.)
- ☐ Run UETP (the User Environment Test Package) 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 the Decompressing System Libraries section.)
- ☐ Remove unwanted files from the system disk using the OpenVMS tailoring utility? (Described in Chapter 10.)
- ☐ 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 the section Running AUTOGEN.)

5

Before Upgrading OpenVMS VAX Software

Overview

Before you begin an upgrade, you need to perform several important tasks to prepare the system. This chapter describes what you need to know and do to prepare for an upgrade, including:

- Being aware of the 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 a less-experienced system manager, you should read the entire chapter and then use the checklist to make sure you have completed all the preupgrade tasks.

Cautions and Restrictions

Introduction

Before you begin the upgrade, take note of the following cautions and restrictions.

Cautions

- If you have the DECset Version 11 layered product installed on your system, you must remove the @DEBUG$STARTUP.COM command from the system startup procedure. The debugger shipped with OpenVMS VAX Version 6.2 is a superset of the debugger that was shipped with the DECset Version 11 software. Removing the @DEBUG$STARTUP.COM command will cause the debugger shipped with OpenVMS VAX Version 6.2 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.

- The Version 6.2 upgrade procedure provides new files and directories in the directory [VMS$COMMON...]. If you had any special protections and access control lists (ACLs) before the upgrade, you need to reapply them to reestablish the security environment you had previously established. For more information on creating and maintaining a secure environment, see the *OpenVMS Guide to System Security*.
- Before you perform an upgrade, remove or rename any special testing or debugging files that you might have in any of the SYS$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.
- The upgrade procedure does *not* work across the network. DECnet for OpenVMS 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 the section Beginning the Upgrade Procedure in Chapter 7). If any of the values are less than that required to upgrade to OpenVMS VAX Version 6.2, 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.
- 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.

- 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 the section Examining AUTOGEN Feedback Data.
- 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: Some optional files can be placed on an alternate device. You cannot tailor files on or off an alternate device.
- Do not attempt to use VMSINSTAL with OPTION G to transfer OpenVMS VAX save sets to another media type; doing so will produce an unusable system. Instead, you can use the DCL command COPY to transfer save sets to another media type.

  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.
- You must not move the system disk or the distribution kit from one drive to another during the upgrade.
- 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.
- 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.
- OpenVMS VAX Version 6.2 software creates a new proxy database that is managed by the new security server process. After upgrading to Version 6.2, you must convert your current proxy database (SYS$SYSTEM:NETPROXY.DAT) to the new format (SYS$SYSTEM:NET$PROXY.DAT).

  At the end of an upgrade, the procedure runs AUTOGEN and reboots the system. At that time (or at some later reboot), you might get one of the following error messages:

```
%SYSTEM-W-PROXYCONVERT, old-format proxy database needs to be converted
%SYSTEM-W-PROXYMISSING, old-format proxy database file is missing
```

  The first message (%SYSTEM-W-PROXYCONVERT) is displayed if the procedure detects an existing NETPROXY.DAT file without a corresponding NET$PROXY.DAT file. This message indicates that you need to run the proxy database conversion utility to convert the database. For information about running this conversion utility, see Converting Your Network Proxy Database in Chapter 8.

The second message (%SYSTEM-W-PROXYMISSING) is displayed if the procedure detects an existing new format proxy database file (NET$PROXY.DAT) but not the corresponding old format file (NETPROXY.DAT). When you convert your proxy database, do *not* delete the old proxy database file. DECnet Phase IV and many layered products use the old file. If you delete the NETPROXY.DAT file by mistake, you can restore it from the backup copy of the system disk that you make before performing an upgrade.

Restrictions

- Before you can upgrade to OpenVMS VAX Version 6.2, your system must be running at least Version 6.0 of the OpenVMS operating system. For example, you can upgrade a system disk to Version 6.2 of the OpenVMS VAX operating system from any of the following versions (or related hardware releases):

  OpenVMS VAX Version 6.0
  OpenVMS VAX Version 6.1

- If you want to use DECwindows software with OpenVMS VAX Version 6.2, you must install Version 1.1 or greater of the DECwindows Motif for OpenVMS VAX layered product if it is not already installed on your system. You can install this layered product either before or after you perform the upgrade.

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

- 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, see the *Volume Shadowing for OpenVMS*.

- 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 6.2 of the OpenVMS VAX operating system is running, check the *OpenVMS Version 6.2 Release Notes* for possible layered-product restrictions. For the most current information about OpenVMS VAX layered products, contact your Digital sales representative.

Are You Ready to Upgrade?

Introduction

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

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 *VMScluster Systems for OpenVMS*.
- 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 will need a transcript in case there is a problem during the upgrade. For more information, see 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 floppy diskette.

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 Digital Software Supply, and request priority shipment of any missing items.
- Before upgrading the OpenVMS VAX operating system, read Appendix A of this manual, the *OpenVMS Version 6.2 New Features Manual*, the *OpenVMS Version 6.2 Release Notes*, and any cover letters included with your kit.

Examining AUTOGEN Feedback Data

Background

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

Note: 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).

How to Check 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 will use it during the upgrade, and you can proceed to the next section.

   If your current feedback data is invalid, AUTOGEN will issue 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.

Backup Tasks

Introduction

Digital 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.

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.

How to Back Up Console Media

If you have one of the following VAX computers, you also must 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 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 6.2 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.

Preparing Your System Disk

Introduction

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 following tasks:

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.

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 CLUSTER_SHUTDOWN 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.

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: 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.

Rename the System Dump File

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

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.

Check Page and Swap Files

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

The swapfile (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 will move them to the system-specific directory before continuing.

The page file 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, Digital 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 the Return key. 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.

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 51,550. Even if you plan to upgrade the OpenVMS *library* or *optional* files, you might not need more than 51,550 free blocks because many files are deleted as the upgrade progresses, thus freeing up additional space.

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)	100
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.

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 Preparing the System). This prevents 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 Digital's use 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
```

If you used the Snapshot facility to boot your current system with a system snapshot image, you must change the BOOT_STYLE system parameter to 0 before you can perform an upgrade. To change the BOOT_STYLE system parameter to 0, enter the following commands:

```
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SET BOOT_STYLE 0
SYSMAN> PARAMETERS WRITE CURRENT
SYSMAN> EXIT
$
```

You can re-execute the Snapshot command procedure (SYS$MANAGER:SNAPSHOT.COM) after the upgrade is completed, as described in the *OpenVMS System Manager's Manual: Essentials*.

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.

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.

The following section, Preparing the System, tells you how to get your system ready for an upgrade.

Preparing the System

To prepare the system for the upgrade, use the following procedure:

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.

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 the Return key.

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

Prevent Interactive Logins

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

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

Check for DECnet for OpenVMS

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 the section Stop Queues:

```
%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 the section Set System Parameters, DECnet should not be running. To set STARTUP_P1 to MIN, repeat all of the preceding steps beginning with the section Set System Parameters. Note that you must shut down and reboot the system for any changes you make to system parameters to take effect.

Check for Volume Shadowing

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

If you have volume shadowing 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 shadowing currently loaded on your system. For information about migrating to phase II, see *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 shadowing, 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 shadowing, and restart the upgrade procedure from the beginning. If you continue with the upgrade without migrating to phase II, volume shadowing will not be present on your system after the upgrade has completed.

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.

Gathering Information for the Upgrade

Introduction

At different points during the upgrade, the procedure prompts you to supply information.

Information You Need

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 (VMS062.C), optional (VMS062.D) OpenVMS components, and OpenVMS Management Station software PC files (VMS062.G). Appendix C 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 C before deciding.
Location for Help Message utility and online manuals	Save set VMS062.E contains the online Help Message utility, and VMS062.F contains three online reference manuals in ASCII format: *OpenVMS Master Index*, *OpenVMS Glossary*, and *Overview of OpenVMS Documentation*. Know the name of the disk on which you will be installing these save sets. You can install these save sets on your system disk or on alternate disks. (However, if you copied the distribution kit to some other media from which you will be performing the installation, you cannot install these save sets on that media.) The contents of save set VMS062.E can reside on one disk, and save set VMS062.F can reside on another alternate disk. However, you cannot divide the text files in save set VMS062.F between disks; they must all be on the same disk.

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) Note that you must install the DECwindows Motif for OpenVMS VAX (previously called VMS DECwindows Motif) layered product if you want to run the DECwindows software. VMS DECwindows Motif Version 1.1 is the minimum supported version for systems running OpenVMS VAX Version 6.2. 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 6.2 kit and install the separate DECwindows Motif for OpenVMS VAX layered product, which supports both Motif and XUI environments.
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.

Where to Go Next

Once you have completed these steps, use the checklist in Preupgrade Checklist to make sure you have completed all the necessary tasks before continuing with the upgrade.

Preupgrade Checklist

Introduction

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

Did You . . .

- ☐ Read the *OpenVMS Version 6.2 New Features Manual*, the *OpenVMS Version 6.2 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 51,550 free blocks for the required files to start the upgrade. (Described in the section Preparing Your System Disk.) The entire upgrade requires about 162,600 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 will 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, see 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 the section Examining AUTOGEN Feedback Data.)
- ☐ 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 these media types?

  RX33
  TU58
  RX50
  RX01
  RL02

  (Described in the section Backup Tasks.)
- ☐ Make sure SYSUAF.DAT is in the SYS$COMMON:[SYSEXE] and VMS$AUDIT_SERVER.DAT is in the SYS$COMMON:[SYSMGR] directory? (Described in the section Preparing Your System Disk.)

- ☐ Make sure SWAPFILE.SYS (if it is located on the system disk) and PAGEFILE.SYS are inthe SYS$SPECIFIC:[SYSEXE] directory? (Described in the section Preparing Your System Disk.)
- ☐ Make sure the page file is at least 4600 blocks? (Described in the section Preparing Your System Disk.)
- ☐ If you have a shared system dump file in SYS$COMMON:[SYSEXE], make sure the shared file is not named SYSDUMP.DMP? (Described in the section Preparing Your System Disk.)
- ☐ 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 the section Preparing Your System Disk.)
- ☐ Set the appropriate system parameters and make sure that STARTUP_P1 is set to MIN? (Described in the section Preparing Your System Disk.)
- ☐ Define the system parameters SCSNODE and SCSSYSTEMID? (Described in the section Preparing Your System Disk.)
- ☐ If your system has a KFQSA controller, make sure the VMS5 parameter is set to 0? (Described in Preparing Your System Disk.)
- ☐ Check the location of your AGEN$INCLUDE files? (Described in the section Check AGEN$INCLUDE Files.)
- ☐ 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 the section Preparing the System.)
- ☐ Migrate to phase II volume shadowing if you are currently using phase I? (Described in the section Preparing the System.)
- ☐ Stop all batch and print queues on the node you are upgrading? (Described in Preparing the System.)
- ☐ Make sure you have the following information (described in the section Gathering Information for the Upgrade) 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 B.

Where to Go Next

To upgrade a standalone system, go to Chapter 7.

To upgrade a VAXcluster environment, go to Chapter 6.

6
Upgrading a VAXcluster Environment

Overview

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

If your cluster environment has both VAX and Alpha systems, you should also refer to the *OpenVMS Compatibility Between VAX and Alpha*.

Concurrent and Rolling Upgrades

Introduction

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.

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 6.2 concurrent upgrades, all nodes in the cluster must be running at least OpenVMS VAX Version 5.5–2. However, the system disk on which you are performing the upgrade must be running OpenVMS VAX Version 6.0 or 6.1. (See the Restrictions section in Chapter 5 for more information.)

To perform a concurrent upgrade, go to the section Concurrent Upgrades.

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 6.2 rolling upgrades, all nodes in the cluster must be running at least OpenVMS VAX Version 5.5–2. However, the system disks you are upgrading must be running OpenVMS VAX Version 6.0 or 6.1. (See the Restrictions section in Chapter 5 for more information.)

To perform a rolling upgrade, go to the section Rolling Upgrades.

Concurrent Upgrades

Introduction

You perform a concurrent upgrade by shutting down the entire cluster, upgrading each system disk, and rebooting each VAX computer in the cluster. When the cluster reboots, each VAX computer will be running the upgraded version of the operating system. Users cannot access the cluster until you upgrade each system disk and reboot each VAX computer.

How to Perform a Concurrent Upgrade

To perform 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.

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.

Rolling Upgrades

Introduction

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

Restrictions

The following restrictions apply to rolling upgrades:

- Digital 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. Digital 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 the section Concurrent Upgrades.
- 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 will cause 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*)

How to Perform a Rolling Upgrade

To perform 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. (*VMScluster Systems for OpenVMS* 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 through 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 will ask 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 5.5–2. For example:

   ```
   * Are the other system disks running OpenVMS V5.5-2 or higher?
   ```

All systems in the cluster must be running at least OpenVMS VAX Version 5.5–2 to perform the rolling upgrade. Type Y and press the Return key.

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 through 7 for each system disk you are upgrading. Once you have performed tasks *a* through *d* in Step 3, you do not need to perform them again.

Adding an OpenVMS VAX Version 6.2 Supported CPU

If you need to add a new CPU supported by OpenVMS VAX Version 6.2 to an existing Version 5.5–2 VAXcluster, Digital supports two options, listed in the following preferred order:

1. Upgrade the entire cluster to OpenVMS VAX Version 6.2 and bring the new CPU in as a member.
2. If you need to keep some systems in the cluster at OpenVMS VAX Version 5.5–2, you must upgrade a system disk in the cluster to Version 6.2 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

Overview

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 B 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.

Preparing to Boot from [SYSF]

Introduction

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 B 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.

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
```

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.

Configuring Devices

Introduction

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.

How to Configure Devices

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
```

Beginning the Upgrade Procedure

Overview

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.

Step 1: Load Distribution Media

Put 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 Step 3: Start VMSINSTAL.

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

Step 2: If 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 VAXVMS062
      %LADCP-I-BIND, service bound to logical unit DAD$VMS062 (_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.

Step 3: Start 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 V6.1

It is 22-JUN-1995 at 15:00.00.00

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 the section Check Quotas and Limits in Chapter 5 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 the Return key.
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.

Note

If you are using an InfoServer device to perform the upgrade, the procedure might display an error message stating that the BYTLM quota is too low. You can safely ignore that message.

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

Step 4: Back 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 Step 5: Specify the Source Drive.

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.

Step 5: Specify 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 the Return key.

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 Step 6: Enter Product Name.

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 Step 2: If Upgrading from the InfoServer.

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 Step 3: Start VMSINSTAL.

If VMSINSTAL does not display an error message, proceed to Step 6: Enter Product Name.

Step 6: Enter Product Name

When VMSINSTAL displays the following message, type VMS062 and press the Return key. Make sure that you use the number zero (not the letter ‘‘O’’) when you type VMS062. For example:

```
* Products: VMS062
```

When the procedure displays the following message, press Return:

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

Step 7: Mount the First Volume

VMSINSTAL displays a message similar to the following:

```
Please mount the first volume of the set on _MUA0.
```

When the procedure displays the following message, type Y (for Yes) S) and press Return:

```
* Are you ready?  Y
```

The procedure displays messages similar to the following:

```
%MOUNT-I-MOUNTED, VMS062 mounted on _MUA0:

The following products will be processed:

  OpenVMS V6.2
```

After a slight pause, the procedure displays messages similar to the following:

```
        Beginning installation of OpenVMS V6.2 at 15:05

%VMSINSTAL-I-RESTORE, Restoring product saveset A...
```

Step 8: Checking for DECnet Products

The DECnet for OpenVMS (Phase IV) software is provided on the OpenVMS VAX Version 6.2 kit. If you are currently running the DECnet/OSI for OpenVMS (Phase V) layered product, the procedure detects this and gives you the option to retain those files. (However, you should upgrade to Version 6.1 of DECnet/OSI for OpenVMS.) See the section Cautions, Restrictions, and Changes in Chapter 1 for more information.

After the OpenVMS VAX Version 6.2 upgrade procedure completes, refer to the section Updating Your DECnet Phase IV Configuration in Chapter 8 for information about configuring your DECnet software if you are running DECnet for OpenVMS. Refer to the section Configuring and Starting DECnet in Chapter 4 if you are running DECnet/OSI for OpenVMS.

Step 9: Monitor 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 the Return key.

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.

Step 10: Verify 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) 22-JUN-1995 15:10
```

Where to Go Next

Continue with Phase 1 of the upgrade.

Upgrade Phase 1

Overview

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 (VMS062.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 the section Preparing to Boot from [SYSF], the system should reboot automatically. Otherwise, you must reboot manually from the SYSF directory.

Step 1: Specify Type of Upgrade

At the beginning of Phase 1, the procedure displays a message similar to the following:

```
        Upgrade Phase 1  22-JUN-1995 15:11:17.05

* 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 the Return key.

If you are performing a rolling upgrade, type Yes and press Return. The procedure will ask you several questions to determine if all system disks in the cluster (other than the one you upgrading) are running at least OpenVMS VAX Version 6.0. Follow the instructions in the Rolling Upgrades section of Chapter 6.

Step 2: Enter 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. 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:
* 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.

%UAF-I-MDFYMSG, user record(s) updated
```

```
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 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 FIELD 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 the Return key. 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 FIELD 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 FIELD 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)

Step 3: Choose Boot Method

If your VAX computer is *not* one of the following, go to Step 4: File Cleanup.

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 the Return key, and go to Step 4: File Cleanup 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.

Step 4: File Cleanup

The procedure does the following:

- 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 - 22-JUN-1995 15:29:41.92
```

Step 5: Select 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                                -  43500 blocks
o OpenVMS optional                               -  19100 blocks
o OpenVMS Help Message                           -   8850 blocks
o Text versions of three OpenVMS manuals         -   4450 blocks
o DECwindows workstation support                 -  25750 blocks
o DECwindows base support                        -   3600 blocks
o OpenVMS Management Station                     -   5900 blocks

Space remaining on system disk: 80696 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: 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 and the three reference manuals can be tailored on to the system disk only. If you do not choose the Help Message files or the three manuals 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 on an alternate disk *after* the installation procedure completes, you can use the BACKUP command, as follows:

```
BACKUP/VERIFY source-device:[000000]VMS062.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. (To install the OpenVMS manuals, specify *VMS062.F/SAVE_SET* in place of *VMS062.E/SAVE_SET*.)

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.

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* (VMS062.C) save set are listed in Appendix C. If you want to install the VMS062.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 VMS062.C files, type No and press Return.

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* (VMS062.D) save set are listed in Appendix C. If you want to install the VMS062.D files, type Yes and press Return. If you do *not* want to install the VMS062.D files, type No and press Return.

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 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.

   Note: To use the OpenVMS Management Station on your PC, you must be
   running Digital's PATHWORKS V5.0A for DOS and Windows (or V5.1) software.

   The OpenVMS Management Station optional files consume approximately 5900
   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:     623240 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 F to prepare your OpenVMS system and your PC to run the OpenVMS Management Station server and client software.

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 8850 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]] DUA1
```

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

```
%MOUNT-I-MOUNTED, VMS062       mounted on DUA1

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

OpenVMS Manuals

The procedure displays the following message:

```
You have the choice of installing the text versions of one or more
OpenVMS reference manuals:

o OpenVMS Master Index                      -   3600 blocks
o OpenVMS Master Glossary                   -    650 blocks
o Overview of OpenVMS Documentation         -    200 blocks

You can install these manuals, by default, to your system disk
in [SYSHLP.VMSDOC] or to an alternate device of your choice.
In either case, all manuals must reside on the same device.
If you choose an alternate device and do not specify a directory,
[VMSDOC_TEXT] will be created for you.  The device structure
for an alternate device should resemble the following:

                    device:[directory]

Do you want any of these three OpenVMS manuals?: (Y/N)
```

Type Yes to install all three manuals or to install a subset of the manuals.

The following message is displayed:

```
Do you want all three OpenVMS manuals? (Y/N)
```

To install all three manuals, type Yes. To install a subset, type No and the system will display each manual title and prompt you to type either Yes or No to select it.

When you have completed selecting which manuals to install, the following prompt is displayed:

```
* Where do you want to install the OpenVMS manual(s)? [SYSHLP.VMSDOC]
```

Press Return to accept the default, [SYSHLP.VMSDOC] on the system disk, or enter the alternate disk name and press Return.

Step 6: Choose DECwindows Support Options

Next, the procedure displays messages about the DECwindows components shipped with OpenVMS VAX Version 6.2.

Important: 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 VAX (previously called VMS DECwindows Motif) layered product, which supports both Motif and XUI environments.

Note: 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.

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 upgrade.

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

     You can install all of the DECwindows components provided in
     this kit, which requires approximately 29350 blocks, or you
     can select specific components.

     o DECwindows workstation support             -  20750 blocks
       -  75 dots per inch video fonts (included)
       - 100 dots per inch video fonts (optional) -   5000 blocks
     o DECwindows base support                    -   3600 blocks

     If you are installing this kit on a workstation or on a VAXcluster
     that contains workstations, then you must choose the DECwindows
     workstation support option.

     If you are installing this kit on a system that does not include
     workstations but does include Xterminals, then you might want to
     choose the DECwindows workstation support option to provide font
     files.  If you decide not to select the DECwindows workstation
     support option at this time, then you will have to use the DECW$TAILOR
     utility to provide font files for the Xterminals.

     If you plan to run DECwindows software, then you must choose the
     DECwindows base support option.

     NOTE: This kit does NOT contain full DECwindows support.  It includes
           only the DECwindows base and workstation support components.
           To obtain full DECwindows support, you must also install the
           separate DECwindows Motif for OpenVMS VAX layered product.

     NOTE: VMS DECwindows Motif Version 1.1 is the minimum version that
           can be used with OpenVMS VAX Version 6.2.

* Do you want to provide optional DECwindows support? (Y/N)
```

Before You Decide

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 that contains workstations or Xterminals	DECwindows workstation support.
Are installing on a workstation or on a VAXcluster that includes workstations or Xterminals	DECwindows workstation support.
Have a workstation monitor capable of displaying 100 dots/inch (for example, a VR150, VR160, or VR295)	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.

If you *do not* want to install the DECwindows software, type No, press Return, and go to the next step.

If you want to install DECwindows support, type Yes and press Return. The procedure displays the following message:

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

If you answer Yes to this prompt, the following DECwindows components will be installed:

- DECwindows workstation support
- 75 dots/inch video fonts
- DECwindows base support

You are also given the option to select the 100 dots/inch video fonts.

If you decide not to install the DECwindows workstation support, you are given the option to select the DECwindows base support, which is required if you plan to run DECwindows software.

```
* Do you want to install DECwindows base support? (Y/N)
```

Step 7: Verify 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:

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

If you answer Yes to this prompt, the procedure restores the OpenVMS required save set (VMS062.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.

Step 8: Shut 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.

On certain VAX computers, the procedure displays the following message:

```
* Press RETURN to shutdown system:
```

Once you have read the information displayed on the screen, press Return to begin the shutdown.

Step 9: Reboot 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
```

For more information on booting your computer from the SYSF directory, see the upgrade and installation supplement for your VAX computer.

Step 10: Verify System Time

When the system reboots, it displays a message similar to the following:

```
  OpenVMS VAX Version V6.2  Major version id = 1 Minor version id = 0
System time is: 22-JUN-1995 15:54:08.30
   .
   .
   .
* Is that correct?
```

If . . .	Then . . .
You want to redisplay the time	Type a question mark (?) and press Return.
The system time displayed by the procedure is correct	Type Yes and press Return.
The system time displayed by the procedure is incorrect	Type No and press Return. The procedure promps you to enter the correct date and time.

Upgrade Phase 2

What the Procedure Does

At the beginning of Phase 2, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V6.2 Upgrade Procedure.

         Upgrade Phase 2         22-JUN-1995 15:55:42.57

%STDRV-I-STARTUP, OpenVMS startup begun at 22-JUN-1995 15:55:43.22
On MIN or UPGRADE system startup - CLUE is not run.
  .
  .
  .

%STDRV-I-STARTUP, VMS startup begun at 22-JUN-1995 15:57:00.59
```

During Phase 2, the upgrade procedure restores the rest of the library (C), optional (D), Help Message (E), OpenVMS manuals (F), and OpenVMS Management Station software (G) save sets and DECwindows support files if you elected to install them.

What You Do

During Phase 2, the procedure prompts you to do the following:

1. If your OpenVMS VAX distribution media is magnetic tape, the procedure asks you to replace volume 1 in the drive with volume 2 prior to restoring the VMS062.C and VMS062.D save sets. After restoring save set VMS062.D, the procedure prompts you to replace volume 2 with volume 3.

   Note: Do not remove the OpenVMS VAX distribution media until prompted to do so.

2. If your distribution media is tape cartridges, the procedure displays a message similar to the following after it restores the OpenVMS VAX files (if your distribution media is compact disc or magnetic tape, you will not see these messages):

   ```
   You can now remove the OpenVMS distribution kit from MUA0:.

   Load the DECwindows distribution kit.
   ```

   If you selected any of the DECwindows support options during Phase 1, put the second tape cartridge, which contains the DECwindows support files, in the source drive. The procedure displays the following:

```
* Enter name of the drive holding the DECwindows distribution media: MUA0
* Is the DECwindows media ready to be mounted? [N] YES
```

   Type Yes and press the Return key.

3. The procedure installs the DECwindows options that you specified and displays messages similar to the following:

```
%MOUNT-I-MOUNTED, DEC062 mounted on _MUA0:

    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

    Restoring DECwindows 100 dots per inch fonts save set ...
%BACKUP-I-STARTVERIFY, starting verification pass
```

4. After restoring the DECwindows files, the procedure displays a message similar to the following:

```
You can now remove the DECwindows distribution kit from MUA0:
```

5. If your distribution media is tape cartridges or magnetic tape, remove the media containing the DECwindows files from the drive.

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

Upgrade Phase 3

What the Procedure Does

At the beginning of Phase 3, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V6.2 Upgrade Procedure

     Upgrade Phase 3                  22-JUN-1995 16:45:18.35
```

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].

Upgrade Phase 4

What the Procedure Does

At the beginning of Phase 4, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V6.2 Upgrade Procedure.

     Upgrade Phase 4            22-JUN-1995 17:14:34.12
```

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.

What You Do

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 the Return key 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
   ```

For more information about booting your system, see the upgrade and installation supplement for your VAX computer.

Where to Go Next

When the system reboots, the procedure displays a message similar to the following:

```
OpenVMS VAX Version 6.2  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.

Upgrade Phase 5

What the Procedure Does

At the beginning of Phase 5, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V6.2 Upgrade Procedure.

     Upgrade Phase 5            22-JUN-1995 17:45:24.03
```

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. Converts all VAXVMSSYS.PAR parameter files found in system roots to Version 6.2 format.
4. If you have DECnet Phase IV installed, checks the security of DECnet for OpenVMS objects and images.
5. Displays messages listing tasks that you can perform after the upgrade procedure is completed. Chapter 8 explains these tasks.

Upgrade Phase 6

Introduction

At the beginning of Phase 6, the procedure displays a message similar to the following:

```
Continuing with OpenVMS VAX V6.2 Upgrade Procedure.

     Upgrade Phase 6       22-JUN-1995 17:45:25.03

Configuring all devices on the system...

%STDRV-I-STARTUP, VMS startup begun at 22-JUN-1995 17:45:25.03
```

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 will display 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
```

Registering Licenses

The upgrade procedure also gives you the opportunity to register any additional licenses.

The procedure displays the following message:

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

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

You do not have to reregister your OpenVMS VAX license or licenses for the following system integrated products:

VAXclusters
DECnet for OpenVMS
RMS Journaling
Volume Shadowing

If you want to register a *new* Product Authorization Key, type Yes and press the Return key. Otherwise, type No and press Return.

For more information on registering licenses, see the description of VMSLICENSE.COM in Appendix A and in the *OpenVMS License Management Utility Manual*.

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$PARAMS.REPORT as one of your postupgrade tasks. This task is described in the section Examining AGEN$PARAMS.REPORT in Chapter 8.

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
   .
   .
   .
```

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 on booting your system, see the upgrade and installation supplement for your VAX computer.

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, see *VMScluster Systems*

for OpenVMS.) All nodes that are booted at this time will run AUTOGEN and reboot.

Executing STARTUP

After the system reboots, the procedure displays the following message:

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

OpenVMS VAX V6.2

You have SUCCESSFULLY installed the OpenVMS 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. For example:

```
%STDRV-I-STARTUP, OpenVMS startup begun at 22-JUN-1995 18:27:30
   .
   .
   .
%SET-I-INTSET, login interactive limit=64, current interactive value = 0

 SYSTEM       job terminated at 22-JUN-1995 18:30:00.00

Accounting information:
 Buffered I/O count:        133   Peak working set size:        401
 Direct I/O count:           12   Peak virtual size:           2379
 Page faults:               325   Mounted volumes:                0
 Charged CPU time 0 00:00:55.23   Elapsed time        0 00:01:31.24
```

At this point the OpenVMS VAX operating system is running.

Logging In

Press the Return key. The system asks for the user name and password. Log in to the SYSTEM account so that you can perform the postupgrade procedures described in Chapter 8.

```
     Welcome to OpenVMS VAX V6.2
Username: SYSTEM
Password:
   .
   .
   .
```

If you forget the password, follow the instructions for performing an emergency startup in the *OpenVMS System Manager's Manual: Essentials*.

Where to Go Next

Go to Chapter 8 to perform the required postupgrade tasks.

8

After Upgrading OpenVMS VAX

Overview

After you upgrade the OpenVMS VAX operating system, you need to perform several important tasks before you can use the system. This chapter describes the following tasks in the order you perform them:

- 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 DECnet for OpenVMS configuration
- Converting your network proxy database
- 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
- 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.

Verifying System Time

Introduction

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.

How to Reset System 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=22-JUN-1995:18:35:30
```

Compensating for Time Zones

If your system communicates with systems in other time zones, you can use the time conversion service and the Coordinated Universal Time (UTC) system services to compensate for differences in time stamps because of differing time zones. For more information, see the *OpenVMS System Manager's Manual: Essentials*.

Restoring the Preferred Node List

Background

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.

Replacing SYSUAF.DAT and VMS$AUDIT_SERVER.DAT

Background

If you permanently store the SYSUAF.DAT and VMS$AUDIT_SERVER.DAT files on the system disk, go to the section Examining AGEN$PARAMS.REPORT.

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 upgrade procedure, these files were updated.

Note: If you did a rolling upgrade, the shared version of SYSUAF.DAT was not updated.

How to Replace 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.

Examining AGEN$PARAMS.REPORT

Background

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 View This Report

To display AGEN$PARAMS.REPORT on your screen, enter the following command and press the Return key:

```
$ 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$OpenVMS062:[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, and DUMP files, see Checking the Size of System Files.

Checking the Size of System Files

Background

AUTOGEN sets the following files at sizes appropriate for your system:

[SYSEXE]SYSDUMP.DMP
[SYSEXE]PAGEFILE.SYS
[SYSEXE]SWAPFILE.SYS

To Modify Size of System Files

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 into the SYSTEM account and enter the following command:

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

For more information, see the *OpenVMS System Manager's Manual: Essentials*.

Examining Your Command Procedures

Background

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.

Files to Examine

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.

Changing MODPARAMS.DAT

Background

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.

What to Look for

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 EXPECTED_VOTES value 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*.

Updating Your DECnet Phase IV Configuration

Introduction

If you are not running DECnet Phase IV software, skip this section and go to the section Updating Your Console Media.

If you are running DECnet Phase IV software, do the following:

Check Network Security Level

Overview

The security of DECnet for OpenVMS objects and images on your system are checked during Phase 5 of the upgrade procedure. If your DECnet configuration does not meet the default level of security, the procedure displays the following message recommending that you run the NETCONFIG_UPDATE command procedure.

```
The upgrade has detected items which should be reviewed to ensure that
DECnet for OpenVMS will operate properly and securely.

Once the upgrade completes, you should manually review the items listed
above.  Failure to do so could leave your node vulnerable to certain
forms of attack.  For more information, consult the OpenVMS VAX Guide
to System Security.

You can execute the command procedure SYS$UPDATE:NETCONFIG_UPDATE.COM
to update the security of your existing DECnet configuration. For more
information on NETCONFIG_UPDATE.COM see the OpenVMS VAX Upgrade and
Installation Manual.
```

NETCONFIG_UPDATE.COM is a command procedure introduced with VMS Version 5.2 that implements several security measures that affect default access to your system. When you run NETCONFIG_UPDATE.COM, your configuration database does not change, except for the changes you might make to the default DECNET account or to the accounts you can create for specific objects.

You can use NETCONFIG_UPDATE.COM to *increase* your level of network security only. The procedure does not prompt you for input if your network configuration meets the minimum level established with VMS Version 5.2.

NETCONFIG_UPDATE.COM generates passwords for each account that you decide to keep in your configuration database. For example, if you currently have a default DECNET account and decide to keep it, NETCONFIG_UPDATE.COM generates a new password for it and replaces the existing password with the new one.

Run the Network Configuration Update Command Procedure

The following is an example of how to run NETCONFIG_UPDATE.COM:

Note: Depending on your network configuration, the procedure might not display all of the questions shown in this example.

1. Enter the following command:

```
$ @SYS$UPDATE:NETCONFIG_UPDATE
```

   The procedure displays the following message:

```
     DECnet for OpenVMS node configuration upgrade procedure

     This procedure will allow you to create, display and
     optionally execute the necessary commands to update your
     executor and object database characteristics so that
     they will be compatible with V5.2 of DECnet for OpenVMS.


     Getting Executor Information
     Getting Object Information

     Modifying Executor node 6.36 (KRUP)
Do you wish a default nonprivileged DECnet account?  [NO]:
```

2. The default DECnet account, named DECNET, allows all network objects general access to the system. It is only appropriate for networks with very low security requirements. For networks with greater security requirements, Digital recommends separate default accounts for specific network objects. After you respond to this prompt, the procedure displays the following message:

```
Do you wish to disable the TASK object?  [YES]:
```

3. The TASK object, by means of the default DECnet account (DECNET), allows user-written command procedures—including those that can be used in attempted break-ins—to be executed on your system. You can disable default access to the TASK object and still allow remote user-written command procedures to run on your system by using access control strings or proxy access. After you respond to this prompt, the procedure displays the following message:

```
Do you want a default account for the MAIL object?  [YES]:
```

4. MAIL is an image that provides personal mail services for VMS systems. To receive MAIL, you must create a default account for the MAIL object. An account named MAIL$SERVER will be created on your system if you reply Yes to this query. After you respond to this prompt, the procedure displays the following message:

```
Do you want a default account for the FAL object?  [NO]:
```

5. FAL (File Access Listener) is the remote file access facility. FAL is an image that receives and processes remote file access requests for files at the local node. A default account for FAL allows network access, by any remote user, to any files marked world accessible. It also allows any remote user to create files in any directory with world WRITE access. An account named

FAL$SERVER will be created on your system if you reply Yes to this query. After you respond to this prompt, the procedure displays the following message:

```
Do you want a default account for the PHONE object?  [YES]:
```

6. PHONE is an image that allows online conversations with users on remote OpenVMS systems. A default account for this object lets anyone in the network get a list of users currently logged in to the local system. A user can then attempt to log in using the list of user names. An account named PHONE$SERVER will be created on your system if you reply Yes to this query. After you respond to this prompt, the procedure displays the following message:

   ```
   Do you want a default account for the NML object?  [YES]:
   ```

7. NML is the Network Management Listener. A default account for this object lets remote users issue NCP TELL commands to gather and report network information from your volatile DECnet for OpenVMS databases. An account named NML$SERVER will be created on your system if you reply Yes to this query. After you respond to this prompt, the procedure displays the following message:

   ```
   Do you want a default account for the VPM object?  [YES]:
   ```

8. VPM is the VMS Performance Monitor. To use the cluster monitoring features of the Monitor Utility (MONITOR), you must create a default VPM account. An account named VPM$SERVER will be created on your system if you reply Yes to this query. After you respond to this prompt, the procedure displays the following message:

   ```
   Do you want a default account for the MIRROR object?  [YES]:
   ```

9. MIRROR is an image that is used for most types of loopback tests, including those run during the DECnet phase of the UETP. To run most loopback tests, you must create a default account for the MIRROR object. An account named MIRRO$SERVER will be created on your system if you reply Yes to this query.

10. Next the procedure displays a series of commands and the following message:

    ```
    Do you wish to execute these commands now?  [YES]:
    ```

11. If you execute the commands, the procedure displays the following message:

    ```
    The DECnet for OpenVMS database has been updated
    ```

For More Information

For a description of the network configuration procedure, NETCONFIG.COM, refer to the *DECnet for OpenVMS Guide to Networking* or to the *DECnet for OpenVMS Networking Manual*.

Run the Cluster Member Update Command Procedure

When you run NETCONFIG_UPDATE.COM on a member of a VAXcluster environment, the NETCONFIG_UPDATE.COM procedure creates the secondary procedure named SYS$COMMON:[SYSMGR]UPDATE_CLUSTER_MEMBERS.COM. The NETCONFIG_UPDATE.COM procedure instructs you to run UPDATE_CLUSTER_MEMBERS.COM on the other VAXcluster members. This secondary procedure modifies the default access of each VAXcluster member exactly as you modified that of the first member.

To run UPDATE_CLUSTER_MEMBERS.COM using SYSMAN, do the following:

```
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> SET ENVIRONMENT/CLUSTER/USER=SYSTEM
     Remote Password:

     %SYSMAN-I-ENV, current command environment:
             Clusterwide on local cluster
             Username SYSTEM will be used on nonlocal nodes
SYSMAN> DO @SYS$COMMON:[SYSMGR]UPDATE_CLUSTER_MEMBERS.COM
SYSMAN> EXIT
```

Converting Your Network Proxy Database

Background

If you upgraded from an OpenVMS VAX Version 6.1 system, go to the section Updating Your Console Media.

If you upgraded from an OpenVMS VAX Version 6.0 system, you must perform the tasks described in this section.

OpenVMS VAX Version 6.2 software creates a new proxy database that is managed by the new security server process. After upgrading to Version 6.2, you must convert your current proxy database (SYS$SYSTEM:NETPROXY.DAT) to the new format (SYS$SYSTEM:NET$PROXY.DAT).

To perform this task, you must have the network up and running. If you installed the DECnet/OSI layered product, the network was automatically started. If you did not install the DECnet/OSI layered product and the network is not up and running, you can start it by entering the following command:

```
$ @SYS$MANAGER:STARTNET
```

How to Convert the Network Proxy Database

To accomplish the conversion, do the following:

1. Shut down the security server by entering the following command:

   ```
   $ SET SERVER SECURITY/EXIT
   ```

2. Define logical names for the location of your existing proxy database and for the location of the converted proxy database by entering the following:

   ```
   $ DEFINE NETPROXY SYS$SYSTEM:NETPROXY.DAT
   $ DEFINE NET$PROXY SYS$SYSTEM:NET$PROXY.DAT
   ```

3. Run the proxy database conversion utility by entering the following:

   ```
   $ RUN SYS$SYSTEM:CONVERT_PROXY
   ```

4. Restart the security server with the following command:

   ```
   $ SET SERVER SECURITY/START
   ```

If you have not installed the DECnet/OSI layered product but do so later, you must repeat this conversion process.

Save Old Database

Do *not* delete the old proxy database file NETPROXY.DAT. DECnet Phase IV and many layered products use the old file. If you delete the NETPROXY.DAT file by mistake, you can restore it from the backup copy of the system disk you made before performing an upgrade.

Updating Your Console Media

If your computer does not use console media, skip this section and go to the Decompressing the System Libraries section.

If your computer uses console media, you must copy the Version 6.2 VMB.EXE onto your system's console media. The procedure for accomplishing this differs depending on the VAX series computer you have. Follow the instructions in the section that applies to your VAX computer.

VAX 8530, 8550, 8810 (8700), 8820-N (8800) Computers

If you have one of the VAX 8000 series computers listed to the left, do the following:

1. Place 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 have been 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 diskette, 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 from 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
```

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

If you have one of the VAX 700 or 8000 series computers listed to the left, 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 into 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:      22-JUN-1995 18:40

  VMB.EXE      80   22-JUN-1995

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 the Return key:

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

4. If you are updating the console medium for a VAX 8600 or VAX 8650 computer, the new VMB.EXE is copied onto the console medium.

   If you are updating the console medium for one of the other VAX computers, the procedure uses the EXCHANGE procedure to copy the contents of the existing console medium, merge the new files onto the copy of the console medium, and create a new version of the console medium. 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 medium and insert a new one.

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, 8650 computers. The device name for the VAX 9000 console hard disk is CSA1.

Decompressing the System Libraries

Background

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 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 the Return key:

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

How to Decompress Libraries

You execute the LIBDECOMP.COM command procedure to decompress the system libraries. To run LIBDECOMP, log into the SYSTEM account, enter the following command, and press Return:

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

The following information is displayed:

```
          VMS Library Decompression Utility

   Options:

    1  HELPLIB.HLB          13  DBG$UIHELP.HLB       25  PATCHHELP.HLB
    2  STARLET.OLB          14  DBG$HELP.HLB         26  PHONEHELP.HLB
    3  VAXCCURSE.OLB        15  EXCHNGHLP.HLB        27  SDA.HLB
    4  VAXCRTL.OLB          16  NCPHELP.HLB          28  SHWCLHELP.HLB
    5  VAXCRTLG.OLB         17  ANLRMSHLP.HLB        29  SYSGEN.HLB
    6  DECCCURSE.OLB        18  DISKQUOTA.HLB        30  TECO.HLB
    7  DECCRTL.OLB          19  EDFHLP.HLB           31  UAFHELP.HLB
    8  DECCRTLG.OLB         20  TPUHELP.HLB          32  EVE$HELP.HLB
    9  ERFLIB.TLB           21  ACLEDT.HLB           33  EVE$KEYHELP.HLB
   10  STARLETSD.TLB        22  INSTALHLP.HLB        34  STARLET.MLB
   11  MAILHELP.HLB         23  LATCP$HELP.HLB       35  LIB.MLB
   12  EDTHELP.HLB          24  MNRHELP.HLB

   or    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.

Testing the System with UETP

Background

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 VMS062.D. If you did not install the optional save set, you can add the UETP files to your system using VMSTAILOR.

Where to Find More Information

For information about using VMSTAILOR see Chapter 10.

For complete information about UETP, see the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*.

Increasing Free Space on the System Disk

Background

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.

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.

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 E 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
```

Restoring Your System Password Dictionary

Background

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.

How to Restore Your Passwords

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
```

Customizing DECwindows Support

Customize 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 Digital

How to Customize DECwindows Support

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.

Preparing to Run the OpenVMS Management Station

Background

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.

How to Prepare Your Systems

Go to Appendix F for 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 F. Use the OpenVMS Version 6.2 distribution media and VMSTAILOR to add the OpenVMS Management Station files to your system. (For information about using VMSTAILOR, see Chapter 10.)

Backing Up the System Disk

Background

Digital 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.

  Note: 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 the section How to Back Up Console Media in Chapter 5.)
- Back up the system disk.

For More Information

For complete information about these operations, see the upgrade and installation supplement for your VAX computer.

Running AUTOGEN

Background

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 hard-coded values in MODPARAMS.DAT affect AUTOGEN's calculations of the feedback parameters. For AUTOGEN to properly calculate minimum values, you should replace the hard-coded values in MODPARAMS.DAT with MIN_ values. The MIN_ prefix specifies the minimum value to which a parameter can be set by 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*.

When to Run AUTOGEN

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, see the upgrade and installation supplement for your VAX 9000 computer.
3. Digital 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, see the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*.

Postupgrade Checklist

Introduction

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

Did You . . .

- ☐ Verify the system time? (Described in Verifying System Time.)
- ☐ Restore the preferred node list for the queue manager? (Described in the section Restoring the Preferred Node List.)
- ☐ Replace SYSUAF.DAT and VMS$AUDIT_SERVER.DAT? (Described in the section Replacing SYSUAF.DAT and VMS$AUDIT_SERVER.DAT.)
- ☐ Examine AUTOGEN output stored in the file AGEN$PARAMS.REPORT? (Described in the section Examining AGEN$PARAMS.REPORT.)
- ☐ Examine the command procedure templates supplied with OpenVMS VAX Version 6.2? (Described in the section Examining Your Command Procedures.)
- ☐ Examine MODPARAMS.DAT? (Described in the section Changing MODPARAMS.DAT.)
- ☐ Start DECnet for OpenVMS (for DECnet Phase IV users only)? (Described in the section Updating Your DECnet Phase IV Configuration.)
- ☐ Convert your network proxy database if you upgraded from OpenVMS VAX Version 6.0? (Described in the section Converting Your Network Proxy Database.)
- ☐ Update your console media? (Described in the section Updating Your Console Media.)
- ☐ Decompress the system libraries using LIBDECOMP.COM? (Described in the section Decompressing the System Libraries.)
- ☐ 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 the section Increasing Free Space on the System Disk.)
- ☐ Restore your local additions to the system password dictionary? (Described in the section Restoring Your System Password Dictionary.)
- ☐ Customize your DECwindows environment? (Described in the section Customizing DECwindows Support.)

- ☐ Build a standalone BACKUP kit? (Described in the section Backing Up the System Disk.)
- ☐ Back up the console media? (Described in the section Backing Up the System Disk.)
- ☐ 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 the section Running AUTOGEN.)

9

Customizing DECwindows Support Software

Overview

This chapter describes how you can customize DECwindows support software. The DECwindows components provided on the OpenVMS Version 6.2 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 Digital

Note: 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.

Customizing the Server Startup

Note

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.

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 for OpenVMS software and local transports.

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 which 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

(continued on next page)

Table 9–1 (Cont.) DECwindows Keymap

Dialect	Model	DECwindows Keymap Name
		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
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

(continued on next page)

Table 9–1 (Cont.) DECwindows Keymap

Dialect	Model	DECwindows Keymap Name
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

(continued on next page)

Table 9–1 (Cont.) DECwindows Keymap

Dialect	Model	DECwindows Keymap Name
		SWISS_GERMAN_LK201LL_TW
Swiss/German	LK401-(AL,LL,BL,ML)	SWISS_GERMAN_LK401AL_DP
		SWISS_GERMAN_LK401AL_TW
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 DEC 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.

Using DEC TCP/IP Services for OpenVMS

Overview

DECwindows contains support for the TCP/IP transport. This support requires DEC TCP/IP Services for OpenVMS, a Digital layered product. Before you can use the DECwindows TCP/IP transport interface, you must install DEC 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 DEC TCP/IP Services for OpenVMS.

You can conserve memory and process slots by configuring DEC 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

For more information about TCP/IP concepts, see the *DEC TCP/IP Services for OpenVMS System Management Guide*.

For information on how to configure the TCP/IP software, see the *DEC TCP/IP Services for OpenVMS Installation and Configuation Guide*.

Using Other Transports with DECwindows

Introduction

DECwindows supports DECnet for OpenVMS, 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.

Writing a Transport Interface

For information about writing a transport interface, see the *VMS DECwindows Transport Manual*.

The transport interface image's filename must have the following format where *name* is the unique transport name:

DECW$TRANSPORT_name (for transports supplied by Digital)
DECW_TRANSPORT_name (for customer-written transports)

Installing the Transport Interface Image

Install the image as a protected image in the SYS$SHARE directory (as defined by an executive mode logical name). Digital recommends that you install the image by adding the following line to SYS$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 the Customizing the Server Startup section of this chapter.

Using the Example Transport

Introduction

DECwindows has an example transport interface based upon the DEC TCP/IP Services for VMS 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.

How to Use the Example Transport

If you have installed DEC TCP/IP Services for VMS 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 the section Customizing the Server Startup for TCP/IP, except use the transport name ‘‘EXAMPLE’’. For example, you could 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 will now use the example transport to display graphics on your workstation screen. For example, you would enter the following command to run the clock:

   ```
   $ RUN SYS$SYSTEM:DECW$CLOCK
   ```

10
Using VMSTAILOR and DECW$TAILOR

Overview

This chapter describes how to add or remove optional OpenVMS VAX files and DECwindows support files from your system disk using VMSTAILOR and DECW$TAILOR. You will need your OpenVMS VAX Version 6.2 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.

Using VMSTAILOR

When to Use 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 Version 6.2 distribution media. (Note that you cannot tailor files on or off an alternate device.)

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 Version 6.2 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, see 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

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 the Return key:

   ```
   $ RUN SYS$UPDATE:VMSTAILOR
   ```

   VMSTAILOR displays a description of the VMSTAILOR program and displays the following message:

   ```
   Do you want to tailor files "ON" or "OFF"?
   ```

3. Enter OFF to remove unwanted files and press the Return key.

   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 How VMSTAILOR Works.

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 online 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 the section Preparing Your System Disk in Chapter 5) or start the DECnet software, and then refer to Step 2 of the Beginning the Upgrade Procedure section in Chapter 7.

3. Enter the following command and press the Return key:

```
$ RUN SYS$UPDATE:VMSTAILOR
```

VMSTAILOR displays a description of the VMSTAILOR program and displays the following message:

```
Do you want to tailor files "ON" or "OFF"?
```

4. Enter ON to add files and press the Return key.

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 How VMSTAILOR Works.

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, suppose you do not need the OpenVMS VAX Version 6.2 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 6.2 that affected the Phone utility.

Sample Session

Example 10–1 illustrates 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)?
```

(continued on next page)

Example 10–1 (Cont.) Sample VMSTAILOR Session

```
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)?

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:

   .
   .
   .
```

Using DECW$TAILOR

When to Use 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. (Note that 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.

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 available to the system. For example, if your OpenVMS VAX Version 6.2 DECwindows distribution kit is on a TK50 tape cartridge, load the second tape cartridge into a TK50 drive that is available to the system.

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 D.

- 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, see 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, see the owner's guide for your monitor.

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 the How DECW$TAILOR Works section.

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 Version 6.2 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 online 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 the section Preparing Your System Disk in Chapter 5) or start the DECnet software, and then refer to Step 2 of Beginning the Upgrade Procedure 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 the How DECW$TAILOR Works section.

After adding files to the system disk, apply any updates that affect them. For example, suppose you delete the Version 6.2 DECwindows 100 dots/inch video font files. Later on, you are able to use the 100 dots/inch fonts, so you run DECW$TAILOR to return the files to the system disk. You must then apply any OpenVMS VAX update that has occurred since Version 6.2 that affected the 100 dots/inch video font files. OpenVMS VAX update procedures create a .TXT file that contains a description of modified files. This file is usually named with the following format: SYS$UPDATE:VMSUn05n.TXT[1].

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

          No subclasses in this tailor class.
          Do you wish to select the entire class (default = NO)?
```

(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

```
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

License Management Notes

Overview

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

Registering Your Licenses

This section provides an overview of the license registration procedure.

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 for OpenVMS
- 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 6.2 also require license registration. See the *OpenVMS License Management Utility Manual* for a full explanation of license registration.

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 Digital Equipment 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 Digital representative the same way as you obtain software.

See Table A–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 A–1 The 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

(continued on next page)

Table A–1 (Cont.) The First VMS or OpenVMS Version That Supports VAX Computers

VMS Version	First Computer Support
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

Using the License Unit Requirement Table (LURT)

Introduction

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 on using the LURT, see the *OpenVMS License Management Utility Manual*.

License Unit Requirement Table

Table A–2 has seven lettered columns (A, B, C, D, E, F, and I; G and H are reserved by Digital 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 A–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

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

(continued on next page)

Table A–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 6000-210, 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
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

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

(continued on next page)

Table A–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 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	93	NA	NA	NA	230	600	600
VAX 7000-720	193	NA	NA	NA	230	600	600
VAX 7000-730	293	NA	NA	NA	230	600	600
VAX 7000-740	393	NA	NA	NA	230	600	600
VAX 7000-750	493	NA	NA	NA	230	600	600
VAX 7000-760	593	NA	NA	NA	230	600	600
MicroVAX II	18	NA	100	NA	230	50	50
MicroVAX 2000, 3100-10e, 3100-20e, 3100-30, 3100-40, 3100-80,	18	NA	100	NA	230	20	20
MicroVAX 3100-90, 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 4000-300, 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

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

(continued on next page)

Table A–2 (Cont.) License Unit Requirement Table (LURT)

	License Types by Code						
	OpenVMS				SIP	LP	
System Marketing Model	**A**	**B**	**C**	**D**	**E**	**F**	**I**
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

License Management Facility Notes

Common Concerns and Questions About LMF

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 Digital 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 OpenVMS VAX 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.

Volume Shadowing for OpenVMS License

When to Register

After you *install* OpenVMS VAX Version 6.2, you *must* register your Volume Shadowing for OpenVMS license before you can use Volume Shadowing. If you *upgraded* to OpenVMS VAX Version 6.2, you do not need to reregister this license.

Volume Shadowing 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 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.

Types of Licenses

Two types of Volume Shadowing licenses are valid for OpenVMS VAX Version 6.2:

- 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 on license for every disk contained in the shadow set.

  For information about OpenVMS VAX Version 6.2 changes to per-disk licensing for Volume Shadowing, refer to the section Cautions in Chapter 1.

See the *Volume Shadowing for OpenVMS* manual for more information about these two licenses.

Other System Integrated Product Licenses

After you *install* OpenVMS VAX Version 6.2, you *must* register licenses for any system integrated product. If you *upgraded* to OpenVMS VAX Version 6.2, you do not need to reregister licenses for system integrated products.

B

Booting from [SYSF] During an Upgrade

Booting Procedures

Introduction

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.

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 the Return key:

```
>>> B/F0000000 device-name
```

Substitute the device name of the system disk for *device-name*.

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 the Return key:

   ```
   >>> 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*.

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*.

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 into 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 the Return key 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 the Return key:

   ```
   $ 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 the Return key:

   ```
   $ 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 the Return key:

   ```
   >>> 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
   ```

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 into 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 the Return key 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 the Return key:

```
$ 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 the Return key:

```
>>> HALT
```

3. Use SYFBOO.CMD to boot from [SYSF]. Enter the following command and press Return:

```
>>> B SYF
```

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, see 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 the Return key:

```
>>> BOOT/R5:F0000000/XMI:3/BI:2/NODE:0E02 DU1
```

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 will boot from the SYSF directory on the system disk and continue with the upgrade procedure.

   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, see the *OpenVMS VAX Upgrade and Installation Supplement: VAX 9000 Series*.

C

OpenVMS VAX Save Set Subclasses

Overview

This appendix lists the file subclasses contained in the following save sets:

- VMS062.C—Library save set
- VMS062.D—Optional save set
- VMS062.E—Help Message save set
- VMS062.F—OpenVMS manuals save set
- VMS062.G—OpenVMS Management Station save set

File Subclasses

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
  X/Open transport interface 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
  Foreign Terminal Support
  LAT-11 terminal server (via Ethernet)
  Standalone backup
  Error Log Report Generator utility (ANALYZE/ERROR)
  DECTPU utility
  Terminal Fallback Facility
  National Character Set utility (NCS)
  C language internationalization utilities

- TECO editor
- EDT documentation
- OpenVMS workstation support
- Workstation device support

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

Save Set E Subclasses

The following files are contained in the Help Message save set:

- Help Message database

Save Set F Subclasses

The following files are contained in the OpenVMS Manuals save set:

- OpenVMS Master Index
- OpenVMS Master Glossary
- Overview of OpenVMS Documentation

Save Set G Subclasses

The following files are contained in the OpenVMS Management Station save set:

- OpenVMS Management Station software PC files

D

DECwindows Display Server and Fonts Components

Overview

This appendix provides a list of files provided by the DECwindows base and workstation support components included on the OpenVMS VAX Version 6.2 distribution kit.

Table of Components

Table D–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.
- WS—Indicates that the component is part of the workstation support.
- FONT—Indicates the component is part of the fonts component.

Table D–1 DECwindows Display Server and Fonts Components

File	Purpose	Component Class
	Files in DECW$KEYMAP Directory	
DECW$KEYMAP		BASE
	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

(continued on next page)

Table D–1 (Cont.) DECwindows Display Server and Fonts Components

File	Purpose	Component Class
	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$FONT_ALIAS_ LUCIDA_100DPI.DAT	Example alias file for 100 dpi Lucida fonts	FONT
	Files in SYS$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

(continued on next page)

Table D–1 (Cont.) DECwindows Display Server and Fonts Components

File	Purpose	Component Class
	Files in SYS$LIBRARY Directory	
DECW$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$SVEXT_DEC_ XTRAP.EXE	Input and event recording and playback extention	WS
DECW$SVEXT_MULTI_ BUFFERING.EXE	DECwindows multi-buffering 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$SVEXT_X3D_PEX_GB_ UCODE.EXE	PEX micro code for 35x0 systems	WS
DECW$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 extention	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

(continued on next page)

Table D–1 (Cont.) DECwindows Display Server and Fonts Components

File	Purpose	Component Class
	Files in SYS$LIBRARY Directory	
DECW$XPORTCOM.H	Common transport definitions	BASE
DECW$XPORTCOM.MAR	Common transport definitions	BASE
DECW$XPORTCOM.R32	Common transport definitions	BASE
DECW$XPORTDEF.H	Transport definitions	BASE
DECW$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

E

NEW_OVER and NEW_UNDER Files

Overview

This appendix lists files installed either over or under existing files during an upgrade.

Where Files Are Installed

Introduction

During an upgrade, the procedure replaces certain files that exist on your system with new versions of those files from the OpenVMS VAX Version 6.2 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 6.2. 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 will have 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 might have made to the existing file will be 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 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
[SYSMGR]WELCOME.TXT

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$IMAGE_VERSION.DAT
[SYSLIB]CDDSHR.EXE
[SYSLIB]EPC$FACILITY.TLB
[SYSLIB]EPC$SHR.EXE
[SYSLIB]UISSHR.EXE
[SYSMSG]EPC$MSG.EXE

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.

[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

F

Preparing to Use OpenVMS Management Station

Overview

This appendix describes how to prepare your OpenVMS system and your PC to run the OpenVMS Management Station server and client software. The information provided includes the following:

- Preliminary procedures, including the following:
  - Editing system files
  - Starting OpenVMS Management Station on other nodes
  - Verifying that you have the proper memory, disk space, media, and the required software to install and run OpenVMS Management Station on your PC
  - Creating installation media for PC client software
- Installing the client software on your PC
- Defining DECnet nodes
- Accessing online help
- PATHWORKS installation tips and guidelines

Introduction

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.

Required Files

During the OpenVMS Version 6.2 installation or upgrade procedure, the OpenVMS Management Station server files are automatically installed on your OpenVMS system disk. However to obtain *complete* support, you must also select the OpenVMS Management Station client software files during the OpenVMS installation or upgrade procedure. Those files are required to create the installation media that you use to install the client software on your PC.

Note: If you did *not* select the OpenVMS Management Station component during the installation or upgrade, you must add those files to your OpenVMS system disk before you follow the instructions in this appendix. Use the OpenVMS Version 6.2 distribution media and VMSTAILOR to add the OpenVMS Management Station files to your system. (For information about using VMSTAILOR, see Chapter 10.)

Checklist

Use the following checklist as a guide to verify that you perform the required tasks described in this appendix:

- ☐ Be sure the optional OpenVMS Management Station client software files are installed on your OpenVMS system.
- ☐ Edit the system startup and shutdown files on your OpenVMS system.
- ☐ Start OpenVMS Management Station on other OpenVMS nodes (optional).
- ☐ Be sure that your PC has at least 8 MB of random-access memory (RAM) and 6 MB of free disk space and that you have two, 3-1/2 inch, high-density floppy diskettes.
- ☐ Be sure that your PC is running MS–DOS Version 5.0 or later and Microsoft Windows Version 3.1 or Microsoft Windows for Workgroups Version 3.11.
- ☐ Be sure your PC is running PATHWORKS V5.0A for DOS and Windows (or V5.1) client software and that the PATHWORKS file PWSOCK.DLL is available to your PC. (If necessary, refer to the section titled PATHWORKS Installation Tips and Guidelines.)
- ☐ Create the PC installation media (on two floppy diskettes) containing the OpenVMS Management Station client software.
- ☐ Install the OpenVMS Management Station client software on your PC.
- ☐ After installing the client software on your PC, define the DECnet node names and network addresses of primary-server OpenVMS systems that you want to manage.
- ☐ Access online help to get started using OpenVMS Management Station.

Preparing Your Systems

Overview

This section includes the following information:

- A list of the OpenVMS Management Station files installed on your OpenVMS system.
- A procedure for editing the system files to enable automatic startup and shutdown of OpenVMS Management Station
- A procedure for starting OpenVMS Management Station on other nodes in a VMScluster
- Preliminary tasks and requirements for preparing your PC to run the client software
- A procedure for creating installation media from the client software installed on the OpenVMS system disk

Preparing Your OpenVMS System

Introduction

During the OpenVMS Version 6.2 installation or upgrade procedure, the OpenVMS Management Station server files are automatically installed on your OpenVMS system disk. After the installation or upgrade is complete, 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.

Files Installed on OpenVMS

The files installed automatically on your OpenVMS system disk following the OpenVMS Version 6.2 installation or upgrade procedure are as follows:

- SYS$SYSTEM:TNT$SERVER.EXE
- SYS$STARTUP:TNT$STARTUP.COM
- SYS$STARTUP:TNT$SHUTDOWN.COM
- SYS$TEST:TNT$IVP.COM
- SYS$COMMON:[SYSTEST.TNT]TNT$SERVER_IVP.EXE
- SYS$HELP:TNT010.RELEASE_NOTES

This file is created when the server is started:

- SYS$COMMON:[SYSEXE]TNT$UADB.DAT

These client software files are installed on your OpenVMS system when you select the OpenVMS Management Station component during the installation or upgrade procedure (or when you later add those files to the system using VMSTAILOR). These files allow you to create the PC installation media (using the procedure described later in the section titled Preparing Your PC).

- SYS$COMMON:[TNT.CLIENT]DISKIMAG.EXE
- SYS$COMMON:[TNT.CLIENT]TNTCLID1.IMG
- SYS$COMMON:[TNT.CLIENT]TNTCLID2.IMG

Editing System Files

You must edit the system startup and shutdown files on your OpenVMS system to provide for automatic startup and shutdown of OpenVMS Management Station when your system is rebooted.

To edit the files, follow these steps:

Step	Action

1	Add the command line that starts OpenVMS Management Station to the system startup file, SYS$MANAGER:SYSTARTUP_VMS.COM.
	
	The following example shows the network startup command line followed by the OpenVMS Management Station startup command line:
	
	`$ @SYS$MANAGER:STARTNET.COM`
	`.`
	`.`
	`.`
	`$ @SYS$STARTUP:TNT$STARTUP.COM`
	
	Note: OpenVMS Management Station cannot start until after the network has started. Therefore, you must position this new command line after the line that invokes the network startup command procedure.

2	Add the following command line to the system shutdown file, SYS$MANAGER:SYSHUTDWN.COM: `$ @SYS$STARTUP:TNT$SHUTDOWN.COM`

Starting OpenVMS Management Station on Other Nodes

If you plan to run OpenVMS Management Station on more than one node in a VMScluster without rebooting, you must start the software on those nodes by entering the following command:

```
$ @SYS$STARTUP:TNT$STARTUP.COM
```

If you are performing an upgrade or an installation and OpenVMS Management Station is already running on your cluster, add the RESTART parameter to the startup command, as follows:

```
$ @SYS$STARTUP:TNT$STARTUP.COM RESTART
```

Preparing Your PC

Introduction

During the OpenVMS Version 6.2 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 VMSTAILOR. After you have prepared your OpenVMS system to run the server software, you must next prepare your PC to run the client software.

Required Memory and Disk Space

Your PC requires 8 MB of random-access memory (RAM) and 6 MB of free disk space to install the OpenVMS Management Station client software.

To determine the amount of memory available on your PC, enter the following command at the MS–DOS prompt:

```
C:\> mem
```

To determine the amount of available free disk space, you can enter the following command at the MS–DOS prompt:

```
C:\> dir
```

Media

You need two 3-1/2, inch high-density floppy diskettes, which have to be formatted. You will use those diskettes to create the PC installation media.

Required Software

Table F–1 describes the software that must be installed on your PC before installing OpenVMS Management Station.

Table F–1 Prerequisite and Optional Software

Prerequisite Products	Purpose
MS–DOS Version 5.0 or later	Operating system
Microsoft Windows Version 3.1 or Microsoft Windows for Workgroups Version 3.11	Windowing capability
PATHWORKS V5.0A for DOS and Windows (or V5.1) client software	ManageWORKS user interface and network transport

PATHWORKS Client Requirements

Note the following PATHWORKS client requirements:

- If you have any version of the PATHWORKS client other than V5.0A or V5.1 installed on your PC, it is not supported by OpenVMS Management Station.

  Refer to the section titled PATHWORKS Installation Tips and Guidelines to help you quickly install the PATHWORKS V5.0A for DOS and Windows (or V5.1) client software.

- OpenVMS Management Station requires that the PATHWORKS file PWSOCK.DLL be available to your PC. PWSOCK.DLL is installed as part of the Socket Library Files option of the PATHWORKS Network Utilities component.

  The error message ''Cannot Find PWSOCK.DLL'' is displayed when you run OpenVMS Management Station if PWSOCK.DLL is not available to your system.

  Refer to the section within PATHWORKS Installation Tips and Guidelines titled Configuring Using Windows for instructions on how to configure the Socket Library Files option to make the PWSOCK.DLL file available.

Creating the Installation Media

Create the PC installation media using the following steps.

1. Open an MS–DOS window on your PC.
2. Copy the files to a temporary directory on your PC from the OpenVMS system on which you have installed the OpenVMS Management Station software.
3. At the MS–DOS prompt, use the NFT utility on the PC to copy the files by entering the following command:

```
C:\> NFT COPY /BLOCK node"username password"::SYS$COMMON:[TNT.CLIENT]*.* \temp-dir
```

   where *node, username*, and *password* are the access control information for an account on the OpenVMS system, and *temp-dir* is the name of the temporary directory.

   Note

   If a DECnet node is not defined in your PC network database, refer to the section in Chapter 4 titled Procedure for Defining DECnet Nodes for instructions.

4. Insert a formatted floppy disk in the 3-1/2 inch floppy disk drive (A in this example). At the MS–DOS prompt, type the following MS–DOS command:

   ```
   C:\> \temp-dir\DISKIMAG \temp-dir\TNTCLID1.IMG a:
   ```

   where *temp-dir* is the temporary directory used in step 2.

   When the DISKIMAG program returns to the MS–DOS prompt, remove the floppy disk and label it ''Disk 1—Setup''.
5. Insert a formatted floppy disk in the 3-1/2 inch floppy disk drive. At the MS–DOS prompt, type the following command:

   ```
   C:\> \temp-dir\DISKIMAG \temp-dir\TNTCLID2.IMG a:
   ```

   where *temp-dir* is the temporary directory used in step 2.

   When the DISKIMAG program returns to the MS–DOS prompt, remove the floppy disk and label it ''Disk 2''.

6. You can delete the files DISKIMAG.EXE, TNTCLID1.IMG, and TNTCLID2.IMG from *temp-dir* after creating the floppy disks.

You can now proceed with the installation of the OpenVMS Management Station PC client software.

Installing the OpenVMS Management Station Client Software on Your PC

Overview

This section provides the following information:

- How to install the OpenVMS Management Station client on a PC
- How to recover from errors during the installation
- How to define DECnet nodes after the installation
- The names of the files that are created on your PC after the installation
- How to access online help to get started using OpenVMS Management Station

Installing the Client Software

Installation Procedure

Follow these steps to install OpenVMS Management Station client on your PC. (Note that this procedure takes about 10 minutes.)

Step	Action
1	Start your PC as you usually do.
2	Insert disk 1 in your floppy disk drive.
3	Enter the Windows environment and click on the Program Manager icon.
4	In the Menu bar of the Program Manager program group, click on File, and then choose Run from the pull-down menu. **Result:** The Run dialog box appears.
5	In the Run dialog box, type: `a:\SETUP.EXE` where a: is the name of the floppy disk drive.
6	Click on the OK button to start the installation. **Result:** A dialog box containing the message ''Initializing setup, please wait...'' appears and is then replaced by a window labeled OpenVMS Setup.
7	To proceed with the installation, click on the Continue button. **Note:** You can stop the installation at any time by clicking on the Exit button. As the installation progresses, the system displays the names of the files as they are copied, and a copy bar indicates what percentage of the installation is done. Also displayed is a reminder to read the OpenVMS Management Station Read Me file for important information.
8	When you are prompted by a dialog box message, remove disk 1 from the disk drive and insert disk 2. Click on OK. **Result:** When the copy bar shows that that all the files are copied, a dialog box displays a message indicating the installation has completed successfully.

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.
- The prerequisite software version is incorrect.
- Disk space and memory necessary for successful installation are inadequate.

Defining DECnet Nodes

Introduction

After installing the client software on your PC, use the MS–DOS Network Control Program (NCP) utility on your PC to define the DECnet node names and network addresses of primary-server OpenVMS systems that you want to manage. OpenVMS Management Station connects your PC to the primary-server system and then routes management operations to the target systems. You can define multiple primary servers.

Note

Failure to access the NCP utility from the MS–DOS prompt can result in connection problems.

By accessing the NCP utility from the MS–DOS prompt, you define DECnet node names and network addresses in both DECnet Phase IV and DECnet Phase V databases. If you access the NCP utility from Windows, data is defined only in Phase V databases.

Procedure for Defining DECnet Nodes

Follow these steps to define DECnet nodes:

Step	Action
1	At the MS–DOS prompt, invoke the NCP utility as follows: `C:\> NCP`

2	At the NCP> prompt, type the following command:
	`NCP> DEFINE NODE addrs NAME name`
	where *addrs* is the DECnet address and *name* is the DECnet node name.
	Example:
	`NCP> DEFINE NODE 19.208 NAME ISTAR`

3	At the NCP prompt, type EXIT and press Return to exit the operation.

Files Created on the PC

The following files (with their directory names) are created on your PC when the OpenVMS Management Station client software is installed:

- PATHWORKS directory (usually \PW)
  - VMSACNT.DLL
  - VMSCLU.DLL
  - VMSINFRA.DLL
  - VMSMGMT.DLL
  - VMSMSCRL.DLL
  - VMSNODE.DLL
  - VMSTIMEL.DLL
  - VMSUAOMM.DLL
  - ACCOUNT.HLP
  - DOMAIN.HLP
  - MANAGE.HLP
  - README.WRI
- Windows directory (usually \WINDOWS)
  - XTIDNW.DLL
  - XTILIB.DLL
- Window systems directory (usually \WINDOWS\SYSTEM)
  - CTL3DV2.DLL

Getting Started

Introduction

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*.

Accessing Online Help

Follow these steps to access the OpenVMS Management Station online help:

Step	Action
1	Open the PATHWORKS Windows Applications program group.
2	Click on the OpenVMS Management Help icon for instructions on how to get started.

PATHWORKS Installation Tips and Guidelines

Overview

This section describes how to do the following:

- Install PATHWORKS for DOS and Windows client software
- Use Windows to configure PATHWORKS client software

Introduction

If you already have the PATHWORKS for DOS and Windows client software installed on your PC, you can disregard this entire section.

If you are installing the PATHWORKS for DOS and Windows client software on your PC because the PATHWORKS client software is a requirement for OpenVMS Management Station (that is, you are not using PATHWORKS to manage a local area network of PCs), you may find the following installation tips and guidelines useful.

For complete installation instructions and detailed information on PATHWORKS, refer to the PATHWORKS documentation.

Required Disk Space

PATHWORKS for DOS and Windows client software requirements for free disk space are different during installation and after installation. Files created during installation can later be deleted. Table F–2 summarizes the storage requirements.

Table F–2 Disk Space Requirements

Kit	During Installation	After Installation
PATHWORKS for DOS and Windows client	Up to 30 MB	7 MB

About Installing and Configuring

You use both MS–DOS and Windows to install and configure the PATHWORKS Client software:

1. Install the client software using MS–DOS.
2. After installation, configure the client software using Windows.

Installing Using MS–DOS

Exit Windows before you begin this installation.

1. The client software installation procedure wants to install the software to the root directory of a ‘‘substituted’’ hard disk. Create a substituted hard drive by typing the following commands at the MS–DOS prompt. Note that the example reflects the PATHWORKS V5.0A for DOS and Windows client software; V5.1 is also supported.

   ```
   C:\> mkdir c:\pwv50a
   C:\> subst x: c:\pwv50a
   ```

   where *x*: is the name of an *unused* MS–DOS drive. (If you have a single hard disk, G is usually a good choice.)

   C is the name of a local drive that meets the space requirements.

2. Insert the LAN Manager setup disk in your PC’s floppy drive. Then type:

   ```
   a:setup
   ```

   Note that A is the MS–DOS drive letter for the floppy drive.

3. Choose the Install Kit option from the Setup window.

4. To install the software to the substituted hard drive created in step 1 (G: was suggested), choose the appropriate drive from the Select Drive list box. (Scroll through the list box if the drive name is not immediately visible.)

   Click on OK.

5. When prompted, insert disk 1 into drive A and click on OK.

   A working dialog box displays the names of the files as they are copied, and a copy gauge indicates what percentage of the installation is done.

6. Insert the LAN Manager setup disk again when you are prompted. Click on the OK button.

7. From the PATHWORKS Installation utility window, click on the arrow to the right of the Installing to: option. Select the substituted drive from the displayed list box.

8. From the Install: list box in the PATHWORKS Installation Utility window, you can choose the PATHWORKS client options you want to install. You need only the following options in the Install: list box.

   DECnet and Utilities
   ManageWORKS
   Network Utilities
   PATHWORKS Tutorial
   PATHWORKS Windows Network

Remove unneeded options from the Install list by clicking on an option, and then clicking on the Remove button to move the selected option to the Do Not Install: list box.

9. Verify your selection of options and click on OK.
10. An Installation Starting dialog box is displayed and you are asked whether you want to go back and read help. Choose NO.
11. When you are prompted, insert the necessary floppy disks to install the software.

    A working dialog box displays the names of the files as they are copied.
12. When the installation process is complete, you are asked whether you want to configure the Workstation Manager; choose NO.
13. An Installation Complete dialog box displays the following message:

    ```
    Exiting PATHWORKS Installation Utility
    ```

    Click on the OK button.
14. At this point, the installation utility returns to the initial Setup window. Click on the Exit option to quit the PATHWORKS Installation utility.

Configuring Using Windows

Use the following steps to configure PATHWORKS client software:

1. Start Windows and choose Run from the File pull-down menu on the Program Manager menu bar. In the Command Line box, type the following:

   x:\pcapp\pwsetup

   where *x*: is the substituted drive that you created in step 1 (G: was suggested).

   Click on the OK button. This starts the PATHWORKS Configuration utility.

2. Click on the OK button in the Please Enter Software Destination box to signify that the displayed default location is correct.

   A PATHWORKS Configuration Warning box is displayed. Click on the OK button to indicate that you want to create the default directory.

3. When you are prompted, verify the substituted drive letter you used when you installed the client software under MS–DOS by clicking OK.

4. Choose the Express option from the displayed Select a Configuration Option list box.

5. In the Express: Select a Workstation Template dialog box, choose the highlighted Blank template by clicking on the OK button.

6. In the Customize: Modify Workstation Configuration template, choose only the following items:

   - PATHWORKS Services
   - Network Adapter Information

   Deselect the other items. Then click on the OK button.

7. You are prompted to select the following tasks (those listed in step 4 of the MS–DOS installation procedure):

   DECnet and Utilities
   ManageWORKS
   Network Utilities
   PATHWORKS Tutorial
   PATHWORKS Windows Network

   Click on each option. Then click on the Add button to move each option to the Run on Workstation list box.

8. Choose the DECnet and Utilities option. Then click on the Detail button.

9. From the displayed list box, double-click on the Network File Transfer option. Then click on the OK button.

10. A Customize: Select PATHWORKS Services for Workstation dialog box is displayed. Choose the Network Utilities option, and click on the Detail button.
11. From the displayed list box, double-click on the Socket Library Files option. Then click on the OK button.
12. From the displayed Customize: Select PATHWORKS Services for Workstation dialog box, click on the OK button.
13. Select the Ethernet adapter installed in your PC by clicking on the appropriate adapter description. Then click on OK.
14. When you are prompted, enter the DECnet node name and DECnet network address. Do not enter the server node name and address. Click on OK.
15. In the Enter Windows Directory dialog box, accept the displayed default by clicking on the OK button.
16. In the Customize: Save Template to Disk dialog box, choose a name for the startup template (any string of characters is permitted), along with an optional description. Then click on the Save button.
17. A displayed message asks whether you want to have the network started automatically via an entry in AUTOEXEC.BAT.

    Select YES. If you start up Windows in AUTOEXEC.BAT, examine AUTOEXEC.BAT after the configuration utility exits to ensure that the call to STARTNET.BAT appears *before* the WIN command.
18. In the displayed Customize: PROTOCOL.INI Editor dialog box, click on the OK button to accept the default options.

    A copy gauge displays the progress of the installation.
19. Select the OK option to exit the displayed Customize: Configuration Completed dialog box.
20. Select the Exit option to exit the PATHWORKS Configuration utility.

Important

You must exit Windows and restart your computer *before* you install the OpenVMS Management Station software.

Starting Windows

The first time Windows starts after this installation, you see the message:

```
Could not load Windows Network
```

Click on the ‘‘Disable this warning’’ button, and then click on the OK button.

Deleting a Directory

Now that you have successfully installed the PATHWORKS Client software and have run the PATHWORKS Configuration utility, you can delete the PWV50A directory, which you created in step 1 when you installed using MS–DOS.

G

Small Capacity System Disks

Overview

This appendix describes some methods you can use to manage small capacity system disks, along with some specific recommendations for installing or upgrading to OpenVMS VAX Version 6.2 and DECwindows Motif for OpenVMS VAX Version 1.2–3 on an RZ23L, RA80, or RM80 system disk. (These recommendations will also work for 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.

Limited Space Support

Introduction

As the OpenVMS VAX operating system and associated layered products continue to develop and mature, their sizes have grown so that previously acceptable system disk devices might 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.

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 6.2 operating system and the DECwindows Motif for OpenVMS VAX Version 1.2–3 layered product cannot fit, in total, on an RZ23L disk device.

However, to preserve the investment in some user configurations, a *limited space support* option has been introduced that will allow the RZ23L 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 RZ23L) is supported as a system device, you must take some explicit action to not install or to remove some portions of the product so the remainder will fit. 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.

Configurations Affected

The RZ23L disk is now too small for the full OpenVMS VAX Version 6.2 and DECwindows Motif for OpenVMS VAX Version 1.2–3 kits, regardless of user configuration. Other disk devices, such as the RZ24 and RD54 disks, will 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 175 megabytes (or about 360,000 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. See the VAXcluster SPD for details.

For specific information about disk space requirements and supported system disks, see 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.

Dealing with a Small System Disk

You can solve small system disk configuration problems 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.

Tailoring Considerations

Introduction

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 RZ23L disk, which has 237,600 blocks (or 121 megabytes) of disk space. However, you can use these methods on any system that is tight on system disk space.

Configuration Goals

The basic configuration goal for the limited space support option is for an environment that is not used for programming. Typically, this would be 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 the section Managing Single or Small System Disk Systems and in the section Managing Multiple Disk Systems.

Note that, during an upgrade or installation, there will be a period of time when the windowing software is likely to be unavailable. This means that, on a workstation, your monitor will function only as an operator console, and you will not be able to use screen-oriented editors.

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 will not be able to 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:
```

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 due to unexpectedly running out of space.

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.

Tailoring Options

The installation and upgrade procedures (for both OpenVMS VAX Version 6.2 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 are doing 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 process.

You can decrease the time needed to perform the tailoring and upgrade tasks by disabling highwater marking on the system disk. To disable highwater marking, enter the following command:

```
$ SET VOLUME/NOHIGHWATER SYS$SYSDEVICE:
```

Depending on the system security you require, you might want to leave highwater marking permanently disabled. Otherwise, you can restore it by entering the following command:

```
$ SET VOLUME/HIGHWATER SYS$SYSDEVICE:
```

Installing OpenVMS VAX Version 6.2 and DECwindows Motif for OpenVMS VAX Version 1.2–3

Introduction

In general, installing OpenVMS VAX Version 6.2 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 RZ23L disk, you cannot select some options and you might have to do some tailoring.

Install OpenVMS VAX Version 6.2

By itself, the entire OpenVMS VAX Version 6.2 distribution kit fits on the RZ23L 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) or OpenVMS manuals because both of these options are also very large. Or, you can select them at the expense of other tailorable options later (or at the expense of reduced user capacity). The Help Message utility consumes 8850 blocks; the OpenVMS manuals consume 4450 blocks.

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 the section System Dump File. 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 RZ23L 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.

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.

Upgrading to OpenVMS VAX Version 6.2 and DECwindows Motif for OpenVMS Version 1.2–3

Introduction

The following sections describe how to upgrade to OpenVMS VAX Version 6.2 with the DECwindows Motif Version 1.2–3 layered product from an OpenVMS Version 6.0 or 6.1 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 6.2.)

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 would 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.

Upgrading to OpenVMS VAX Version 6.2

Before beginning the upgrade procedure, prepare the system environment—notably the dump, page, and swap files (see the section Controlling the Size of Dump, Page, and Swap Files)—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 (51,550 blocks) to start the upgrade but probably will 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.

Digital recommends that you not take any of the optional online manuals or the Help Message utility (unless you install them on an alternate device). You will 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.

Managing Single or Small System Disk Systems

Introduction

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 fashion, along with a corresponding reduction in system disk I/O.

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$SYSTEM:PAGEFILE.SYS, as a temporary dump file, so that the space used for dump files is not permanently reserved and gets used only in the event of a crash. To do this, you will need to modify some system parameters in SYS$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.

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 will not physically remove the file until the system is shutdown 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 pagefile, 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, see the *OpenVMS VAX System Dump Analyzer Utility Manual*.

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.

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 ! Setup 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, you would use REPLY/NOLOG, or to disable accounting, you would use SET ACCOUNTING/DISABLE. For more information about using these commands, see the *OpenVMS DCL Dictionary*.

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 will also save considerable disk space on any system with constrained disk space.

Managing Multiple Disk Systems

Introduction

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.

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, see the *OpenVMS System Manager's Manual*.

Copying Dump Files

At startup, you can enhance the use of the paging file as a dump file that will automatically copy 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.

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 see the *OpenVMS System Manager's Manual*, the *OpenVMS DCL Dictionary*, or the utility reference manual for the utility whose files you want to offload.

Offloading Nonessential Files

Some of the online manuals included with OpenVMS VAX Version 6.2 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 the manuals. For a small system disk configuration with multiple disks, this approach is recommended if you want the manuals or the Help Message utility (MSGHLP) to be available online.

Glossary

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. Digital 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 LAN (local area network).

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. Examples: compact discs, magnetic tapes, floppy diskettes, disk packs, tape cartridges.

MOP server

A computer system running DECnet that downline loads VAXcluster satellites using the DECnet MOP 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. A 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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