AA–NG89A–TE

DEC Trellis Object System

Installation Guide for VMS

November 1990

This guide describes how to install the DEC Trellis Object System on the VMS operating system.

Operating System and Version: VMS Version 5.3

Software Version: DEC Trellis for VMS Version 1.0

digital equipment corporation
maynard, massachusetts

November 1990

The Reader's Comments forms at the end of this document request your critical evaluation to assist in preparing future documentation.

This document was prepared using VAX DOCUMENT, Version 1.2.

Contents

2 Installing DEC Trellis

3 After Installing DEC Trellis

A Sample Installation

B Files and Logical Names Installed on Your System

Tables

Preface

Purpose of This Guide

This guide describes how to install the DEC Trellis Object System Version 1.0 on the VMS operating system.

Please note that this guide:

- Should be kept with your distribution kit. You will need to use it again if you have to reinstall the DEC Trellis Object System for any reason.
- Describes the installation procedure step-by-step.
- Does not contain release notes. The DEC Trellis Object System provides online release notes.

Who Should Use This Guide

This guide is intended for system managers and others responsible for installing the DEC Trellis Object System.

Structure of This Guide

Information in this guide is presented as follows:

Chapter 1	Describes the required operating system components, prerequisite and optional software, and installation procedure requirements.
Chapter 2	Describes general information for installing the DEC Trellis Object System, the installation procedure, and error recovery.

Chapter 3	Describes what to do after VMSINSTAL has completed.
Appendix A	Contains a sample installation of the DEC Trellis Object System.
Appendix B	Contains a list of the files and logical names created or modified by the installation procedure.

For More Information

In addition to this manual, you can refer to the following for more information on the DEC Trellis Object System:

- DEC Trellis Object System Software Product Description (SPD)

  Is the precise and legally binding definition of the software and its functionality.

- *DEC Trellis Object System Release Notes*

  Contains last-minute information about the current release. This information is available online.

- *DEC Trellis Object System Introduction*

  Provides introductory information on object-oriented programming concepts and describes the documentation set.

- *DEC Trellis Object System Guide to Programming*

  Provides how-to information to help you get started in using the programming tools and building applications.

- *DEC Trellis Object System Language Reference Manual*

  Provides reference information on the DEC Trellis Object System language constructs.

- *DEC Trellis Object System Guide to Tools*

  Provides detailed information about the programming tools and introduces the programming environment and its capabilities.

- *DEC Trellis Object System Type Library Reference Manual*

  Provides information on the DEC Trellis Object System type library.

- *DEC Trellis Object System Installation Guide for ULTRIX*

  Provides instructions for installing the DEC Trellis Object System on the ULTRIX operating system.

Other related documents include:

- The *Guide to VMS Software Installation* which provides information about installing layered products on VMS systems.

- The *VMS Backup Utility Manual* which describes how to back up your system disk before installing DEC Trellis.
- The *DECwindows User's Guide* which describes using DECwindows tools and the DECwindows user interface.

Conventions

This manual uses the following conventions:

In examples, an implied carriage return occurs at the end of every line, unless noted. You must press the RETURN key at the end of each line of input.

`Courier font`	Represents operation and component names, as well as category names.
Helvetica Bold font	Represents DEC Trellis Object System commands and keywords.
$\boxed{\text{Ctrl/x}}$	Indicates that you press the Ctrl (control) key and hold it down while pressing the specified letter key.
KEY/x	Indicates that you press the first key and hold it down while pressing the second key. For example for SHIFT/MB2, you would press the shift key and the middle mouse button.
$	The dollar sign is used to indicate a generic command line prompt. This prompt may be different on your system.
Blue-green	Indicates information that you must enter from the keyboard or a screen object that you must choose or click on. For online versions, user input is shown in **bold**.

1

Preparing to Install DEC Trellis

This chapter discusses the preparations and requirements necessary for installing DEC Trellis.

Your bill of materials (BOM) and indented bills report (BIL) specify the number and contents of your media. Be sure to verify the contents of your kit with this information. If your kit is damaged or if you find that parts of it are missing, contact your Digital representative.

DEC Trellis provides online release notes. For information on accessing the online release notes, see Section 2.1.

1.1 Prerequisite Hardware

DEC Trellis can be installed on any VAX processor running the VMS operating system.

1.2 Prerequisite and Optional Software

Table 1–1 provides information on the software you must have installed on your system before installing DEC Trellis. The table also includes information about optional software that you can use together with DEC Trellis. The System Software Addendum (SSA) contains a complete list of prerequisite and optional software and their required version numbers.

Table 1–1 Prerequisite and Optional Software

Prerequisite Products	Purpose
VMS DECwindows Base Component	Run the Trellis environment
VMS DECwindows Device Support Component	Display Trellis windows
Optional Products	**Purpose**
VAX RDB/VMS Development System Version 3.1	Use Trellis SQL Type Library

1.3 License Registration

Before you install and run DEC Trellis Version 1.0 on a newly licensed node or cluster, you must first register a License Product Authorization Key (License PAK) using the License Management Facility (LMF). The License PAK may be shipped along with the kit if you ordered the license and media together; otherwise, it is shipped seperately to a location based on your license order.

You must register and load your license for DEC Trellis *before* you start the installation in order to run the Installation Verification Procedure (IVP) and use the software.

To register a license under VMS, first log in to the system manager's account, SYSTEM. You then have a choice of two ways to perform the registration:

- Invoke the SYS$UPDATE:VMSLICENSE.COM procedure. When it prompts you for information, respond with data from your License PAK.
- At the DCL prompt, enter the LICENSE REGISTER command with the appropriate qualifiers that correspond to License PAK information.

If you plan to use DEC Trellis on more than one node in a VAXcluster, you must perform a license load on the other nodes after you complete this installation. See Section 3.4 for more information.

For complete information on using LMF, see the *VMS License Management Utility Manual*.

1.4 Special Requirements for Installing DEC Trellis

There are several unique requirements for installing Trellis. They are:

- Installing optional type libraries
- Specifying the locations for Trellis source code and workspaces
- Compiling Trellis source code

1.4.1 Optional Type Libraries

During the Trellis installation, you are asked if you want to install some optional Trellis type libraries. Consult with your Trellis users to determine which type libraries are of interest to them. There are four type libraries:

- The *example program* contains source code for the student/course database that is referenced in the user documentation.
- The *SQL type library* provides code to allow Trellis users to access data in RDB/VMS databases.
- The *callin/out development type library* provides code to allow users to call in to Trellis code from other programming languages, and call out from Trellis to code written in other languages.
- The *standalone application type library* allows a user to extract an application from a development workspace, strip out all debug information and unused types, and form a smaller standalone application.

1.4.2 Source Code and Workspaces

DEC Trellis consists of a programming environment and a set of DECwindows tools. Most of the Trellis programming environment is written in Trellis. When you install the kit, an extensive source-code library, including the source code for the programming environment, is copied onto your system.

When Trellis compiles a set of source files, it keeps all relevant information for all the files in memory and saves this information in a single file called a *workspace*. Because of the extensive code library that Trellis provides, workspaces can become very large files.

To ease system disk space requirements, the installation allows you to install the source files and workspaces on a device other than the system disk. The installation prompts you for a location to save the sources, and a location for the workspaces. The Trellis startup file, SYS$STARTUP:TRELLIS$STARTUP.COM defines 2 system logical devices TRELLIS$SOURCEDEV and TRELLIS$TWSDEV to point to these locations.

Because Trellis uses these locations to define logical devices, you are prompted to enter either a device name or a rooted directory specification. A rooted directory specification is a way to make a directory or subdirectory appear as a logical disk volume. To specify a root directory, the directory *must* contain a trailing period (.), such as DUA22:[ROOT.]. Note that the device specified *cannot* be a rooted logical device itself. For more information, see the *Guide to VMS File Applications*.

Note *These directories will NOT be created during the installation. You must create them before running VMSINSTAL.*

Since users will need to create their own workspaces as well, it might be convenient to set aside a device for these files separate from normal user files. You may want to create subdirectories below TRELLIS$TWSDEV for your Trellis users as well.

1.4.3 Compiling Trellis Source Code

The installation procedure copies the Trellis source files onto your system, but does not compile these files into workspaces. After the installation completes, the source files must be compiled using the Trellis compiler. A command procedure has been provided to do this. See Section 3.5 for more information.

1.5 Installation Procedure Requirements

The following sections discuss various requirements for installing DEC Trellis.

The installation takes approximately 30 to 60 minutes, depending on your type of media and your system configuration.

Installing DEC Trellis and running the Installation Verification Procedure (IVP) on a standalone VAXstation 3100 system takes 50 minutes.

1.5.1 Privileges and Disk Space

To install DEC Trellis, you must be logged in to an account that has SETPRV or at least the following privileges:

- CMKRNL
- WORLD
- SYSPRV

Note that VMSINSTAL turns off BYPASS privilege at the start of the installation.

DEC Trellis's requirements for free disk storage space are different during installation and after installation. Table 1–2 summarizes the storage requirements.

Table 1–2 Disk Space Requirements

Kit	Blocks During Installation	Blocks After Installation
DEC Trellis Version 1.0		
System Disk	10000 blocks	5000 blocks
Trellis Sources	4000 blocks	4000 blocks
Trellis Workspaces	0	91500 blocks

The DEC Trellis installation allows you to install some parts of the kit on a device other than the system disk. The table is set up to show each piece of the installation: system disk, source code, and workspaces. Each of these can be put in a separate location. See Section 1.4.2 for more information on the breakdown of the kit.

To determine the number of free disk blocks on the current system disk, enter the following command at the DCL prompt:

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

1.5.2 Pagefile Size

Installing DEC Trellis requires a pagefile of at least 60000 pages.

You can determine the current size of the pagefile by entering the command:

```
$  SHOW MEMORY
```

There are two ways to increase your pagefile:

1. Edit SYS$SYSTEM:MODPARAMS.DAT by adding the following line to the end of the file:

   ```
   PAGEFILE=60000
   ```

   and then running AUTOGEN. See Section 1.5.3.3 for more information about changing system parameters with AUTOGEN.

2. Invoke the command procedure:

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

1.5.3 System Parameters

Installing DEC Trellis requires certain system-parameter settings. Table 1–3 lists the minimum required system-parameter values for the installation. Depending on the kinds of programs and applications running at your site, you might need higher values for some settings.

Table 1–3 Minimum Required System-Parameter Values

System Parameter	Minimum Value
CLISYMTBL	500[1]
GBLPAGES	n + 4000[2]
GBLSECTIONS	n + 20[2]
VIRTUALPAGECNT	60000
WSMAX	20000[3]

[1]The CLISYMTBL dynamic system parameter must be set to a minimum value of 500 during the installation procedure. You can change the setting to its original value after the installation.

[2]These parameter values are *optional*. GBLPAGES and GBLSECTIONS need only be set if you are installing DEC Trellis as a shareable image. The values listed represent the number of free (available) global pages and global sections required to install DEC Trellis as a shareable image, not the total number you need to run your system and other software.

[3]The WSMAX parameter is a *recommended* value for installation. Installation can continue with a smaller value, but performance may suffer.

The following sections show you how to:

- Check system-parameter values
- Calculate values for the GBLPAGES and GBLSECTIONS system parameters
- Change parameter values with the VMS AUTOGEN command procedure
- Set dynamic parameters, such as CLISYMTBL, with the VMS System Generation Utility (SYSGEN)

1.5.3.1 Checking System-Parameter Values To check the values of your system parameters, enter the following command at the DCL prompt to invoke the System Generation Utility (SYSGEN):

```
$  RUN SYS$SYSTEM:SYSGEN
SYSGEN>
```

At the SYSGEN> prompt, enter the SHOW command to display the value of a system parameter. The values displayed should equal or exceed the value of each system parameter listed in Table 1–3. The following example displays the value for the WSMAX system parameter:

```
SYSGEN>  SHOW WSMAX
```

After checking the parameters with the SHOW command, enter the EXIT command at the SYSGEN> prompt to return to DCL level.

1.5.3.2 Calculating the Values for GBLPAGES and GBLSECTIONS

To install DEC Trellis as a shareable image, you must have sufficient free global pages and global sections. You must first find out how many free global pages and sections you have on your system. Then use AUTOGEN if you need to increase the GBLPAGES and GBLSECTIONS system parameters.

If you are installing DEC Trellis on a VMS Version 5.2 system, you can use the WRITE command with the F$GETSYI lexical function to find the number of free global pages and global sections. The following example shows how to get this information at your terminal (the default for SYS$OUTPUT):

```
$  WRITE SYS$OUTPUT F$GETSYI("FREE_GBLPAGES")
15848
$  WRITE SYS$OUTPUT F$GETSYI("FREE_GBLSECTS")
24
```

If the values displayed by the system are greater than the values in Table 1–3, you do not need to increase the values for these parameters. If the value of free global pages or global sections is less than the value in Table 1–3, you must increase the system-parameter setting.

Section 1.5.3.3 describes the procedures for increasing these values using AUTOGEN.

1.5.3.3 Changing System-Parameter Values with AUTOGEN

Use the AUTOGEN command procedure to change system parameters. AUTOGEN automatically adjusts values for parameters that are associated with the values you reset manually. To change system parameters with AUTOGEN, edit the following file:

```
SYS$SYSTEM:MODPARAMS.DAT
```

Use an editor to access the file. To change a parameter value listed in this file, delete the current value associated with that parameter and enter the new value.

To add a new parameter, add a line to the file that includes both the name of the parameter and its value. For example:

```
WSMAX = 20000
```

To modify incremental parameters such as GBLPAGES and GBLSECTS, use ADD_. The following example increases the global page setting by 4000:

```
ADD_GBLPAGES = 4000
```

Note that when you set the pagefile quota, do not use a value that exceeds the amount of pagefile space available on the system.

After you make all your changes, exit from the editor and execute the AUTOGEN procedure to recalculate your system parameters. Enter the following command at the DCL prompt:

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

When you specify REBOOT, AUTOGEN performs an automatic system shutdown and then reboots the system. Any users logged on to the system are immediately disconnected during the shutdown. The automatic reboot puts the new parameter values into effect.

The AUTOGEN Utility automatically adjusts some of the SYSGEN parameters based on the consumption of resources since the last reboot. If you do not want to take advantage of this automatic adjustment, include the NOFEEDBACK qualifier on the AUTOGEN command line.

For more information about using AUTOGEN, see the VMS System Management Subkit.

1.5.3.4 Setting Dynamic System-Parameter Values Use the System Generation Utility (SYSGEN) to set dynamic parameters. Dynamic parameters changed with the SYSGEN WRITE ACTIVE command become active immediately without any need to reboot your system. In fact, rebooting returns dynamic system-parameter values to their previous settings.

Once you change dynamic parameter values, complete the installation before rebooting the system. After you finish with the installation, you can reset the dynamic parameters to their previous values or let them reset automatically when you reboot your system.

DEC Trellis requires the dynamic parameter values listed in Table 1–4.

Table 1–4 Required Dynamic Parameter Values

Dynamic Parameter	Value
CLISYMTBL	500

If the dynamic parameter values on your system are less than the values previously listed, use the following series of commands to change the values. This example changes the CLISYMTBL value to 500:

```
$  RUN SYS$SYSTEM:SYSGEN
SYSGEN>  USE ACTIVE
SYSGEN>  SET CLISYMTBL 500
SYSGEN>  WRITE ACTIVE
SYSGEN>  EXIT
```

1.5.4 Process Account Quotas

The account you use to install DEC Trellis must have sufficient quotas to enable you to perform the installation. Table 1–5 summarizes the process quotas required for the installation account.

Table 1–5 Process Account Quotas for the Installing Account

Account Quota	Value
BYTLM	20480
PGFLQUO	60000
WSDEF	1024
WSQUO	15000[1]
WSEXTENT	30000[2]

[1]The value for WSQUO should be about 50% to 75% of WSMAX.

[2]The value for WSEXTENT should be greater than WSMAX to allow the working set to grow to WSMAX if there is no competition for memory.

User account quotas are stored in the file SYSUAF.DAT. Use the VMS Authorize Utility (AUTHORIZE) to verify and change user account quotas. First set your directory to SYS$SYSTEM and then run AUTHORIZE:

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

At the UAF> prompt, enter the SHOW command with an account name to check a particular account. For example:

```
UAF>  SHOW SMITH
```

To change a quota, enter the MODIFY command. The following example changes the FILLM quota for the SMITH account and then exits from the utility:

```
UAF>  MODIFY SMITH /FILLM=50
UAF>  EXIT
```

After you exit from the utility, the system displays messages indicating whether or not changes were made. Once the changes have been made, you must log out and log in again for the new quotas to take effect.

For more information on modifying account quotas, see the description of the Authorize Utility in the VMS System Management Subkit.

1.5.5 VMSINSTAL Requirements

When you invoke VMSINSTAL, it checks the following:

- Whether you have set your default device and directory to SYS$UPDATE
- Whether you are logged in to a privileged account
- Whether you have adequate quotas for installation
- Whether any users are logged in to the system

VMSINSTAL requires the installation account to have a minimum of the following quotas:

ASTLM = 24
BIOLM = 18
BYTLM = 18,000
DIOLM = 18
ENQLM = 30
FILLM = 20

If VMSINSTAL detects any problems during the installation, it notifies you and asks if you want to continue the installation. In some instances, you can enter YES to continue. To stop the installation process and correct the situation, enter NO or press RETURN. Correct the problem and restart the installation.

1.5.6 Backing Up Your System Disk

At the beginning of the installation, VMSINSTAL asks if you have backed up your system disk. Digital recommends that you do a system disk backup before installing any software.

Use the backup procedures that are established at your site. For details on performing a system disk backup, see the section on the Backup Utility in the VMS System Management Subkit.

2

Installing DEC Trellis

This chapter explains how to install DEC Trellis. Section 2.1 contains a step-by-step description of the installation procedure.

2.1 The Installation Procedure

The DEC Trellis installation procedure consists of a series of questions and informational messages. See Appendix A for a sample installation.

To abort the installation procedure at any time, press CTRL/Y. When you press CTRL/Y, the installation procedure deletes all files it has created up to that point and exits. You can then start the installation again.

1 **Invoke VMSINSTAL.**

@SYS$UPDATE:VMSINSTAL saveset-name device-name OPTIONS N

To start the installation, invoke the VMSINSTAL command procedure from a privileged account, such as the SYSTEM account. VMSINSTAL is in the SYS$UPDATE directory. The following list defines the elements of the VMSINSTAL command procedure:

saveset-name
The installation name for the component. For DEC Trellis, use the following installation name:

```
$  @SYS$UPDATE:VMSINSTAL TRELLIS010 MUA6: OPTIONS N
```

device-name
The name of the device on which you plan to mount the media. For example, MUA6: is the device name for a tape drive. It is not necessary to use the console drive for this installation. However, if you do use the console drive, you should replace any media you removed once the installation is complete.

OPTIONS N

An optional parameter that indicates you want to see the question on release notes. If you do not include the OPTIONS N parameter, VMSINSTAL does not ask you about the release notes. You should review the release notes before proceeding with the installation in case they contain additional information about the installation. If you are restarting the installation and have already reviewed the release notes, you do not need to specify OPTIONS N.

Note that there are several other options you can select when you invoke VMSINSTAL.

- Auto_answer option (A): Initially creates a file that contains your answers to VMSINSTALL questions and prompts. You can then use the option (and the answer file) to save time during a reinstallation (typically after upgrading your system).
- Get save set option (G): Lets you store product save sets temporarily on a magnetic tape or in a disk directory.
- File log option (L): Logs all activity to the terminal during installation.
- Alternate root option (R): Lets you install the product to a system root other than that of the running system.

See the VMS documentation on software installation in the VMS System Management Subkit for detailed information on these options. If you specify more than one option, separate the options with commas (OPTIONS A,N).

The following example invokes VMSINSTAL to install DEC Trellis from tape drive MUA6: and shows the system response. This example uses the OPTIONS N release note parameter:

```
$  @SYS$UPDATE:VMSINSTAL TRELLIS010 MUA6: OPTIONS N

      VAX/VMS Software Product Installation Procedure V5.3


It is 25-MAY-1990 at 22:47.
Enter a question mark (?) at any time for help.
```

If you do not supply either the product name or the device name, VMSINSTAL prompts you for this information later in the installation procedure. VMSINSTAL does not prompt you for any options, so be sure to include OPTIONS N on the VMSINSTAL command line to access the release notes during the installation.

2 Confirm system backup.

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

VMSINSTAL asks if you are satisfied with your system backup. You should always back up your system disk before performing an installation. If you are satisfied with the backup of your system disk, press RETURN. Otherwise, enter NO to discontinue the installation. After you back up your system disk, you can restart the installation.

3 Mount the media.

```
Please mount the first volume of the set on MUA6:.
* Are you ready?  YES
%MOUNT-I-MOUNTED, DEC Trellis MOUNTED ON _$$MUA6:  (NODE 1)
The following products will be processed:

  TRELLIS V1.0


    Beginning installation of TRELLIS V1.0 at 22:47

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

You should now mount the first distribution volume on the device you specified when you invoked VMSINSTAL. The device name appears in the line preceding the question. VMSINSTAL then asks you if you are ready to continue with the installation.

If you respond YES to indicate that you are ready, VMSINSTAL displays a message that the media containing DEC Trellis has been mounted on the specified device and that the installation has begun.

If you entered the wrong device name when you invoked VMSINSTAL and need to restart the installation, enter NO in response to the ‘‘Are you ready?’’ question. To abort the installation for other reasons, press CTRL/Y.

4 Mount additional media volumes.

```
%BACKUP-I-READYREAD, mount volume 2 on _MUA6: for reading

Enter "YES" when ready:
```

If your installation kit contains more than one volume, VMSINSTAL prompts you to mount the additional volumes and then asks you to indicate that you are ready for the installation to proceed.

5 Select a release notes option.

```
Release notes included with this kit are always copied to SYS$HELP.

Additional Release Notes Options:

    1.  Display release notes
    2.  Print release notes
    3.  Both 1 and 2
    4.  None of the above

* Select option [2]:
```

If you specified OPTIONS N when you invoked VMSINSTAL, you are now asked to choose one of the four options for reviewing the release notes.

If you select option 1, VMSINSTAL displays the release notes immediately on the console terminal. You can terminate the display at any time by pressing CTRL/C.

If you select option 2, VMSINSTAL prompts you for the name of the print queue that you want to use:

```
* Queue name [SYS$PRINT]:
```

You can press RETURN to send the file to the default output print device or you can enter another queue name.

If you select option 3, VMSINSTAL displays the release notes immediately on the console terminal and then prompts you for a queue name for the printed version.

Select option 4 if you have already reviewed the release notes and are restarting the installation.

Next, VMSINSTAL displays the following question:

```
* Do you want to continue the installation [N]?:  YES
%VMSINSTAL-I-RELMOVED, The product's release notes have been
                                    successfully moved to SYS$HELP.
```

To continue the installation, enter YES. Otherwise, press RETURN. In either case, the release notes are copied to a file in the SYS$HELP directory:

```
SYS$HELP:TRELLIS$010.RELEASE_NOTES
```

After the installation, you can enter the following command to review the release notes through the Help facility:

```
$  HELP TRELLIS RELEASE_NOTES
```

Note *The name of the release notes file installed by VMSINSTAL consists of the current product name and version number. Do not delete release notes for previous versions of DEC Trellis.*

6 **Specify a workspace device.**

```
Trellis requires a rooted directory for storing workspaces.
This location must already exist.
```

```
* Where should workspaces be kept :
```

Specify a value that will be assigned to the TRELLIS$TWSDEV system logical. You must specify a rooted file specification. For example:

```
* Where should workspaces be kept :   $DUA0:[WORKSPACES.]
```

A rooted directory specification is a way to make a directory or subdirectory appear as a logical disk volume. To specify a root directory, the directory *must* contain a trailing period (.) such as DUA22:[ROOT.]. Note that the device specified *cannot* be a rooted logical device itself. For more information, see the *Guide to VMS File Applications*.

See Section 1.4 for more information on TRELLIS$TWSDEV.

7 **Specify a source code device.**

```
Trellis requires a rooted directory for storing DEC Trellis
source code.  This location must already exist.
```

```
* Where should the source code be kept :
```

Specify a value that will be assigned to the TRELLIS$SOURCEDEV system logical. You must specify a rooted file specification, For example:

```
* Where should the source code be kept :  $DUA0:[SOURCES.]
```

A rooted directory specification is a way to make a directory or subdirectory to appear as a logical disk volume. To specify a root directory, the directory *must* contain a trailing period (.), such as DUA22:[ROOT.]. Note that the device specified *cannot* be a rooted logical device itself. For more information, see the *Guide to VMS File Applications*.

The installation will create subdirectories under this device for the workspace source files and any type libraries installed.

8 **Choose the type libraries to install.**

```
Which type libraries should be installed?

*     the example programs [NO]?
*     the SQL type library [NO]?
*     the callin/out development package [NO]?
*     the standalone application package [NO]?
```

Select the type libraries of interest.

9 Respond to license registration queries.

```
Product:       TRELLIS-V-USER
Producer:      DEC
Version:       1.0
Release Date:  12-NOV-1990

* Does this product have an authorization key registered and loaded?
```

The installation procedure displays license information about your product and then asks if you have registered and loaded your Product Authorization Key (PAK).

If you have not registered and loaded your PAK, you must answer NO to this question. You have to register and load your PAK to successfully execute the Installation Verification Procedure. You can complete the installation without a license installed, but you will be unable to execute the IVP or run the product.

10 Choose the Installation Verification Procedure (IVP) option.

```
* Do you want to run the IVP after the installation [YES]?
```

If you have a license installed, the installation procedure now asks if you want to run the IVP. The IVP for DEC Trellis checks that the installation is successful. Digital recommends that you run the IVP.

After DEC Trellis is installed, you can run the IVP independently to verify that the software is available on your system. You might need to run the IVP after a system failure to make sure that users can access DEC Trellis.

11 Purge files.

```
* Do you want to purge files replaced by this installation [YES]?
```

You have the option to purge files from previous versions of DEC Trellis that are superseded by this installation. Digital recommends purging. However, if you need to keep files from the previous version, enter NO in response to the question.

12 Read informational messages.

At this point, the installation procedure displays a number of informational messages that report on the progress of the installation. There are no further questions. If the installation procedure has been successful up to this point, VMSINSTAL moves the new or modified files to their target directories, updates help files, and updates DCL tables, if necessary. If you choose to have files purged, that work is done now. The following message is displayed:

```
%VMSINSTAL-I-MOVEFILES, files will now be moved to their target
                                   directories...
```

13 Observe the Installation Verification Procedure (IVP).

If you choose to run the IVP, VMSINSTAL runs it now. When the IVP runs successfully, you see a number of compiler warnings, and then output from a running Trellis program. For example:

```
 Starting DEC Trellis V1.0 Installation Verification

    Trellis V1.0 - Rev 1.90(3)
    Copyright © Digital Equipment Corporation 1990  All Rights Reserved


Messages for TRELLIS$SOURCEDEV:[SYSTEM]HASHED.TRE;1

    52  component me.hashvalue: Integer
         ^
        INFO: Beware of unimplemented operation GET_HASHVALUE(me) in TIME
        In GET_HASHVALUE(me) in TIME

Messages for TRELLIS$SOURCEDEV:[SYSTEM]MEMORY.TRE;1

    75  operation page_in (mytype)
         ^
        INFO: Beware of unimplemented operation PAGE_IN(mytype) in MEMORY
        In PAGE_IN(mytype) in MEMORY

Messages for TRELLIS$SOURCEDEV:[SYSTEM]OPERATION_OBJECT.TRE;1

    60  operation create (Mytype, op_name: String, mytype_flag: Boolean)
         ^
        INFO: Operations CREATE(me) in PARTIALLY_BOUND_OPERATION_OBJECT and CREATE(me)
in OPERATION_OBJECT have incompatible specifications.
        In CREATE(me) in OPERATION_OBJECT

Messages for TRELLIS$SOURCEDEV:[SYSTEM]READABLE.TRE;1

   101  operation read_from_start (Mytype, s: In_stream)
         ^
        INFO: Beware of unimplemented operation READ_FROM_START(mytype) in READABLE
        In READ_FROM_START(mytype) in READABLE

Messages for TRELLIS$SOURCEDEV:[SYSTEM]SEQUENCE.TRE;1

   213  operation fill (Mytype, length: Integer, x: T)
         ^
        INFO: Beware of unimplemented operation FILL(mytype) in SEQUENCE[]
        In FILL(mytype) in SEQUENCE[]

   419  operation fill_copy (Mytype, length: Integer, x: T)
         ^
        INFO: Beware of unimplemented operation FILL_COPY(mytype) in SEQUENCE[]
        In FILL_COPY(mytype) in SEQUENCE[]


Message Summary
    Informationals: 7
    Caveats:        0
    Errors:         0
```

```
Evaluating THE_TRELLIS_SYSTEM ...
DEC Trellis Installation Verification Procedure:
     beginning execution tests.

Testing Object creation
Testing Garbage Collection: temporary area
...collecting temporary area took: 0 00:00:01.450
Testing File and Stream i/o
Testing Time routines
Testing Real Number routines
Testing Garbage Collection: all areas with reorganization <please wait>
...collecting all areas took: 0 00:00:36.030
Testing Integer routines
Testing String routines
Testing Type routines
...pretty printing all types
...finding closure
Testing Operation Object routines

 ELAPSED:    0 00:00:59.95  CPU: 0:00:51.25  BUFIO: 68  DIRIO: 9  FAULTS: 9753

 DEC Trellis V1.0 Installation Verification Procedure completed successfully.
```

14 **End the installation procedure.**

```
         Installation of TRELLIS V1.0 completed at 23:36

         VMSINSTAL procedure done at 23:37

$
```

The previous messages indicate that the entire installation procedure is complete.

You can now log out of the privileged account:

```
$  LOGOUT
SYSTEM     logged out at 25-MAY-1990 23:37:01.44
```

Note that VMSINSTAL deletes or changes entries in the process symbol tables during the installation. Therefore, if you are going to continue using the system manager's account and you want to restore these symbols, you should log out and log in again.

2.2 Error Recovery

If errors occur during the installation itself or when the Installation Verification Procedure (IVP) is running, VMSINSTAL displays failure messages. If the installation fails, you see the following message:

```
%VMSINSTAL-E-INSFAIL, The installation of DEC Trellis V1.0 has failed.
```

If the IVP fails, you see these messages:

```
The Trellis V1.0 Installation Verification Procedure failed.

%VMSINSTAL-E-IVPFAIL, The IVP for Trellis V1.0 has failed.
```

Errors can occur during the installation if any of the following conditions exist:

- The operating system version is incorrect.
- A prerequisite software version is incorrect.
- The quotas necessary for successful installation are insufficient.
- The system parameter values for successful installation are insufficient.
- The VMS help library is currently in use.
- The product license has not been registered and loaded.

For descriptions of the error messages generated by these conditions, see the VMS documentation on system messages, recovery procedures, and VMS software installation. If you are notified that any of these conditions exist, you should take the appropriate action as described in the message. For information on installation requirements, see Chapter 1.

3
After Installing DEC Trellis

The following tasks take place after installing DEC Trellis:

- Running the Installation Verification Procedure separately
- Editing the system startup and shutdown files
- Modifying system parameter settings
- Setting user account quotas
- Tailoring your system
- Enhancing performance
- Reporting problems

3.1 Running the Installation Verification Procedure Separately

You usually run the Installation Verification Procedure (IVP) during installation. If you want to run the IVP separately to ensure the integrity of installed files should system problems occur, execute the following command procedure:

```
$  @SYS$TEST:TRELLIS$IVP
```

3.2 Editing the System Files

You must edit the system startup file to provide automatic startup of DEC Trellis when your system is rebooted.

Add the command line that executes the DEC Trellis startup file to the system startup file, SYS$MANAGER:SYSTARTUP_V5.COM. DEC Trellis cannot start until after the network has started. You must position this new command line *after* the line that invokes the network startup command procedure. The following example shows the network startup command line followed by the DEC Trellis startup command line:

```
$  @SYS$MANAGER:STARTNET.COM
      .
      .
      .
$  @SYS$STARTUP:TRELLIS$STARTUP.COM
```

3.3 Modifying System Parameters

The installation for DEC Trellis requires that you raise the value of the CLISYMTBL system parameter. Once the installation is complete, lower it to ensure efficient system performance. Table 1–3 contains the values for the parameters under normal operations.

3.4 VAXcluster Considerations

If the processor on which you installed DEC Trellis is a member of a VAXcluster environment, you need to take the following steps to make DEC Trellis available to other cluster members:

1. Load your license on each node in the VAXcluster system that will use DEC Trellis. See Section 3.4.1 about loading licenses on satellite nodes.
2. Install the new DCLTABLES.EXE on each node in the cluster. See Section 3.4.1 about installing new DCL tables on satellite nodes.
3. Run the DEC Trellis startup_command procedure, TRELLIS$STARTUP.COM, on each node in the cluster. See Section 3.4.1 about running startup procedures on satellite nodes.
4. Run the IVP on all satellite nodes to verify that DEC Trellis is accessible from each node. See Section 3.4.1 about running the IVP on satellite nodes.
5. Edit the system startup files of the cluster members on which you want to run DEC Trellis so they invoke the DEC Trellis startup procedure. You must log into each node as SYSTEM to edit the system startup file. See Section 3.2 about editing system files.

3.4.1 Using SYSMAN to Load Licenses, Update DCLTABLES, Run Startup Procedures, and RUN the IVP on Each Node

You can use the VMS SYSMAN utility to load licenses, update the DCL tables, and run the startup procedure and the IVP on each node of your VAXcluster environment. Perform the following steps if you have installed the DEC Trellis License PAK and want to perform these operations on all nodes of a cluster:

```
$  RUN SYS$SYSTEM:SYSMAN
SYSMAN>  SET ENVIRONMENT /CLUSTER /USERNAME=SYSTEM
Remote Password: (supply SYSTEM password here)
SYSMAN>  DO LICENSE LOAD TRELLIS-V-USER
SYSMAN>  INSTALL REPLACE SYS$COMMON:[SYSLIB]DCLTABLES.EXE
SYSMAN>  DO @SYS$STARTUP:TRELLIS$STARTUP
SYSMAN>  DO @SYS$TEST:TRELLIS$IVP
SYSMAN>  EXIT
```

If you want to perform these operations on only certain nodes of a cluster, substitute the /CLUSTER qualifier in the preceeding example with the names of the nodes on which you want to perform the operations.

3.5 Compiling the Initial DEC Trellis Workspaces

The DEC Trellis installation installs the appropriate executables and source files for workspaces, but the standard workspaces are *not* created. These files have to be compiled after the installation has completed. To create these files, execute the command file:

```
$  @TRELLIS$LIB:TRELLIS$COMPILE_WORKSPACES
```

This script will run for 30 to 45 minutes, depending on your configuration. It will create 2 files in TRELLIS$TWSDEV:[COMMON]:

- library.tws
- trellis.tws

3.6 User Account Requirements

To work with DEC Trellis, user accounts on your system must have certain privileges and quotas. The next two sections contain information on these requirements.

3.6.1 Privileges

To use DEC Trellis, each account must have at least the TMPMBX and NETMBX privileges. Use the VMS Authorize Utility to determine if users have the privileges they require.

3.6.2 User Account Quotas

You must make sure that the appropriate user accounts have sufficient quotas to be able to use DEC Trellis. Table 3–1 summarizes the required user account quotas.

Table 3–1 User Account Quotas for Using DEC Trellis

Account Quota	Value
BYTLM	20480
PGFLQUO	60000
WSDEF	1024
WSQUO	15000[1]
WSEXTENT	30000[2]

[1]The value for WSQUO should be about 50% to 75% of WSMAX.

[2]The value for WSEXTENT should be greater than WSMAX to allow the working set to grow to WSMAX if there is no competition for memory.

See Section 1.5.4 for a description of how to verify and change account quotas.

3.7 Tailoring Your System

This section provides information about special system arrangements and cleanup procedures that you can perform after installing DEC Trellis.

3.8 Enhancing DEC Trellis Performance

This section includes information on system tuning and explains how to install DEC Trellis as a shared image.

3.8.1 Tuning Your System

After you install DEC Trellis, you might want to adjust your system to enhance performance or to lower the use of some system resources. In particular, you should look at adjusting WSMAX. DEC Trellis is a memory-intensive program, so increasing the working set size may noticeably increase performance.

3.8.2 Installing DEC Trellis as a Shared Image

If you expect DEC Trellis to be used extensively on your system, you can reduce the system overhead and memory requirements by installing it as a shared image. To install DEC Trellis as a shared image on a system that is currently running, use the VMS Install Utility (INSTALL). Digital recommends that you install DEC Trellis as shared on a system that has been rebooted recently because the available space in the global page table is less likely to be fragmented.

To install DEC Trellis as a shared image, determine the number of available global pages and global sections on your system. See Section 1.5.3.2 for information on how to verify and modify the number of global pages and global sections. Table 1–3 contains the guidelines for setting these parameters.

Once you have reset the system parameter values, invoke the VMS Install Utility from a privileged account and then install DEC Trellis as a shared image:

```
$  INSTALL
INSTALL>  ADD SYS$SHARE:TRELLIS$IMAGESHR.EXE /OPEN /SHARED
INSTALL>  EXIT
```

Now, add the following lines to the appropriate system startup command file so that DEC Trellis is available as a shared image each time the system is started. (If your site has modularized its startup procedures, be sure you add the lines to the correct file. The default startup command file for V5.0 is SYS$MANAGER:SYSTARTUP_V5.COM):

```
$  INSTALL
INSTALL>  ADD SYS$SHARE:TRELLIS$IMAGESHR.EXE /OPEN /SHARED
INSTALL>  EXIT
$
```

When you install DEC Trellis as a shared image, you need to increase the global pages and global sections parameters. Increase global pages (GBLPAGES) by 4000 pages and global sections (GBLSECTIONS) by 20 sections. Refer to Section 1.5.3 for information on changing these parameters.

3.9 Determining and Reporting Problems

If you encounter a problem while using DEC Trellis, report it to Digital. Depending on the nature of the problem and the type of support you have, you can take one of the following actions:

- Submit a Software Performance Report (SPR).
- Fill out and submit a Reader's Comments form if the problem has to do with the DEC Trellis documentation. Reader's Comments forms are at the back of each manual. Use the form from the manual in which you found the error. Include the section and page number.

Review the Software Product Description (SPD) and Warranty Addendum for an explanation of the warranty. If you encounter a problem during the warranty period, report the problem as indicated above or follow alternate instructions provided by Digital for reporting SPD nonconformance problems.

A

Sample Installation

This appendix contains a sample installation of DEC Trellis. This sample was run on a system that had no previous version of DEC Trellis installed.

```
$ @sys$update:vmsinstal trellis010 mua6:

        VAX/VMS Software Product Installation Procedure V5.3


It is 27-SEP-1990 at 11:17.

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

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


The following products will be processed:

  TRELLIS V1.0


        Beginning installation of TRELLIS V1.0 at 11:17

%VMSINSTAL-I-RESTORE, Restoring product save set A ...
%VMSINSTAL-I-RELMOVED , The product's release notes have been successfully moved
 to SYS$HELP.
 Checking version of VMS, ...

 Trellis requires a rooted directory for storing workspaces.
 This location must already exist.

* Where should workspaces be kept : erlbb$dua0:[workspaces.]

 Trellis requires a rooted directory for storing DEC Trellis
 source code.  This location must already exist.

*  Where should the source code be kept
: erlbb$dua0:[sources.]

 Which type libraries should be installed?

*      the example programs [NO]? y
*      the SQL type library [NO]?
*      the callin/out development package [NO]?
*      the standalone application package [NO]?

 Checking disk space, ...
```

```
 Checking quotas,  ...


        Product:      TRELLIS-V-USER
        Producer:     DEC
        Version:      1.0
        Release Date: 12-NOV-1990

* Does this product have an authorization key registered and loaded? yes

 This kit contains an Installation Verification Procedure (IVP)
 to verify the correct installation of the Trellis compiler.

 After the installation is complete, you can invoke the IVP
 at any time to verify that Trellis is installed and working
 correctly by executing the command:

     @SYS$TEST:TRELLIS$IVP

* Do you want to run the IVP after the installation [YES]?
* Do you want to purge files replaced by this installation [YES]?



 All the questions regarding the installation have now been asked.
 The installation will now continue for between 30 and 60 minutes
 depending on your CPU type and the installation options you
 have chosen.

%VMSINSTAL-I-RESTORE, Restoring product save set B ...
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:
[SYSTEST.TRELLIS].
%VMSINSTAL-I-RESTORE, Restoring product save set C ...

 Installing DEC Trellis workspace sources ...
     workspace sources installed.

%VMSINSTAL-I-RESTORE, Restoring product save set D ...

 Installing DEC Trellis type libraries ...
     type libraries installed.


    After the installation completes, create the common set of workspaces
    with the following command:

        $ @TRELLIS$LIB:TRELLIS$COMPILE_WORKSPACES

    See the installation guide for more information.


    To automatically set up Trellis on your system, edit your
    local system start-up command procedure SYS$MANAGER:SYSTARTUP_V5.COM
    so that it invokes the Trellis start-up command procedure.  Add:

            "@SYS$STARTUP:TRELLIS$STARTUP.COM"

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...

 Starting DEC Trellis V1.0 Installation Verification


    Trellis V1.0 - Rev 1.90(3)
    Copyright © Digital Equipment Corporation 1990  All Rights Reserved


Messages for TRELLIS$SOURCEDEV:[SYSTEM]HASHED.TRE;1
```

```
    52  component me.hashvalue: Integer
         ^
        INFO: Beware of unimplemented operation GET_HASHVALUE(me) in TIME
        In GET_HASHVALUE(me) in TIME

Messages for TRELLIS$SOURCEDEV:[SYSTEM]MEMORY.TRE;1

    75  operation page_in (mytype)
         ^
        INFO: Beware of unimplemented operation PAGE_IN(mytype) in MEMORY
        In PAGE_IN(mytype) in MEMORY

Messages for TRELLIS$SOURCEDEV:[SYSTEM]OPERATION_OBJECT.TRE;1

    60  operation create (Mytype, op_name: String, mytype_flag: Boolean)
         ^
        INFO: Operations CREATE(me) in PARTIALLY_BOUND_OPERATION_OBJECT and CREATE(me)
in OPERATION_OBJECT have incompatible specifications.
        In CREATE(me) in OPERATION_OBJECT

Messages for TRELLIS$SOURCEDEV:[SYSTEM]READABLE.TRE;1

   101  operation read_from_start (Mytype, s: In_stream)
         ^
        INFO: Beware of unimplemented operation READ_FROM_START(mytype) in READABLE
        In READ_FROM_START(mytype) in READABLE

Messages for TRELLIS$SOURCEDEV:[SYSTEM]SEQUENCE.TRE;1

   213  operation fill (Mytype, length: Integer, x: T)
         ^
        INFO: Beware of unimplemented operation FILL(mytype) in SEQUENCE[]
        In FILL(mytype) in SEQUENCE[]

   419  operation fill_copy (Mytype, length: Integer, x: T)
         ^
        INFO: Beware of unimplemented operation FILL_COPY(mytype) in SEQUENCE[]
        In FILL_COPY(mytype) in SEQUENCE[]


Message Summary
    Informationals: 7
    Caveats:        0
    Errors:         0

Evaluating THE_TRELLIS_SYSTEM ...
DEC Trellis Installation Verification Procedure:
     beginning execution tests.
```

```
Testing Object creation
Testing Garbage Collection: temporary area
...collecting temporary area took: 0 00:00:01.450
Testing File and Stream i/o
Testing Time routines
Testing Real Number routines
Testing Garbage Collection: all areas with reorganization <please wait>
...collecting all areas took: 0 00:00:36.030
Testing Integer routines
Testing String routines
Testing Type routines
...pretty printing all types
...finding closure
Testing Operation Object routines

 ELAPSED:    0 00:00:59.95  CPU: 0:00:51.25  BUFIO: 68  DIRIO: 9  FAULTS: 9753

 DEC Trellis V1.0 Installation Verification Procedure completed successfully.

        Installation of TRELLIS V1.0 completed at 12:07

        VMSINSTAL procedure done at 12:07
```

B

Files and Logical Names Installed on Your System

The DEC Trellis installation procedure installs a number of files on your system and defines some logical names. Section B.1 lists the files installed. Section B.2 lists the logical names that are added to the system logical name table.

B.1 File Names

The following list contains the names of all files created on your system when DEC Trellis is installed.

- sys$help:trellis$010.release_notes
- sys$system:trellis.exe
- sys$share:trellis$imageshr.exe
- sys$startup:trellis$startup.com
- sys$library:trellis.dat
- sys$test:trellis$ivp.com
- sys$test:trellis.dir
- sys$test:[trellis]non-interactive.tre
- trellis$sourcedev:[000000]system.dir
- trellis$sourcedev:[system]library.files
- trellis$sourcedev:[system]env.files
- trellis$sourcedev:[system]trellis.files
- trellis$sourcedev:[system]trellis$compile_workspaces.com

- trellis$sourcedev:[system]*.tre (lots of files)

Installing the Example programs includes the following files:

- trellis$sourcedev:[000000]examples.dir
- trellis$sourcedev:[examples]box_drawing_tool.tre
- trellis$sourcedev:[examples]sample_tool.tre
- trellis$sourcedev:[examples]student_tools_demo.tre

Installing the SQL library includes the following files:

- trellis$sourcedev:[000000]sql.dir
- trellis$sourcedev:[sql]link_interface.com
- trellis$sourcedev:[sql]sql_interface.opt
- trellis$sourcedev:[sql]sql_interface.sqlmod
- trellis$sourcedev:[sql]sql_interface.tre

Installing the Callin/Callout Development Package includes the following files:

- sys$library:trellis.h
- trellis$sourcedev:[000000]callin.dir
- trellis$sourcedev:[callin]callin_example.c
- trellis$sourcedev:[callin]callin_example.tre
- trellis$sourcedev:[callin]callin_example_input.txt
- trellis$sourcedev:[callin]callin_example_output.check
- trellis$sourcedev:[callin]callin_example_universals.opt
- trellis$sourcedev:[callin]callin_example_libraries.opt
- trellis$sourcedev:[callin]callin_example_make.com
- trellis$sourcedev:[callin]callin_example_readme.
- trellis$sourcedev:[callin]trellis_main.c
- trellis$sourcedev:[callin]trellis_main_make.com
- trellis$sourcedev:[000000]callout.dir
- trellis$sourcedev:[callout]callout.tre
- trellis$sourcedev:[callout]callout_example.tre
- trellis$sourcedev:[callout]callout_example_readme.
- trellis$sourcedev:[000000]builtins.dir

- trellis$sourcedev:[builtins]builtin_example.c
- trellis$sourcedev:[builtins]builtin_example.tre
- trellis$sourcedev:[builtins]builtin_example_universals.opt
- trellis$sourcedev:[builtins]builtin_example_libraries.opt
- trellis$sourcedev:[builtins]builtin_example_make.com
- trellis$sourcedev:[builtins]builtin_example_readme.

Installing the Standalone Application Package includes the following files:

- trellis$sourcedev:[000000]standalone.dir
- trellis$sourcedev:[standalone]standalone_trellis_system.tre
- trellis$sourcedev:[standalone]standalone_trellis_translator.tre

B.2 Logical Names

The following logical names are entered into the system logical name table when DEC Trellis is installed. These names are stored in the product's startup file. They are automatically entered into the system logical name table whenever the system reboots or whenever the software is invoked.

- TRELLIS$SOURCEDEV
- TRELLIS$TWSDEV
- TRELLIS$MAIN
- TRELLIS$IMAGE
- TRELLIS$LIB