Compaq Fortran Installation Guide for OpenVMS Alpha Systems

Order Number: AA–PU3AG–TE

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This guide describes how to install Compaq Fortran and the Compaq Extended Math Library (CXML) on an Alpha processor system running the OpenVMS operating system. It also describes how to read the online release notes.

Revision/Update Information:	This manual supersedes the previous version of this manual, order number AA–PU3AF–TE.
Operating System:	OpenVMS Alpha Version 7.1 (or higher; see Section 1.1)
Software Version:	Compaq Fortran Version 7.5 (or higher)

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Preface

This guide explains how to install Compaq Fortran on an Alpha processor system running the OpenVMS™ operating system. It also describes how to install the Compaq Extended Math Library (CXML), formerly the DIGITAL™ Extended Math Library (DXML). It also describes how to read the online release notes.

Keep this guide with your distribution kit. You will need it to install maintenance updates or to reinstall Compaq Fortran for any other reason.

This manual applies to Version 7.5 of Compaq Fortran and all subsequent releases until a revised installation guide is issued.

Intended Audience

This guide is intended for system managers who install Compaq Fortran.

Structure of This Document

This guide contains the following chapters:

- Chapter 1 describes the hardware and software requirements for Compaq Fortran and CXML installations. It also lists related procedures that you must complete before installing Compaq Fortran.

- Chapter 2 describes how to install Compaq Fortran, including an example installation.

- Chapter 3 describes post-installation considerations.

- Appendix A lists the files installed.

- Appendix B lists the installation messages.

Associated Documentation

In addition to this guide, the Compaq Fortran documentation set includes the following:

- A language reference manual:

  - *Compaq Fortran Language Reference Manual* for the Compaq Fortran language, which fully supports the Fortran 90 and Fortran 95 standards.

  - *DEC Fortran Language Reference Manual* for the Compaq Fortran 77 language.

- A user manual, either the *Compaq Fortran User Manual for OpenVMS Alpha Systems* or the *DEC Fortran User Manual for OpenVMS AXP Systems*

- A letter titled *Read Before Installing or Using Compaq Fortran Version n.n for OpenVMS Alpha Systems* ("read first" cover letter)

- Compaq Fortran online release notes

- CXML online release notes and the *Compaq Extended Math Library Reference Guide*

- CXML example programs in SYS$COMMON:[SYSHLP.EXAMPLES.CXML] (described in the file READ_ME.INDEX in that directory)

For the location of the Compaq Fortran "read first" cover letter and the release notes, see Section 1.1.

Once installed, you can use Compaq Fortran online HELP, which describes the command qualifiers, explains run-time messages, and provides a quick-reference summary of language topics. To use online HELP, type HELP followed by the command name as in the following example:

```
$ HELP FORTRAN
```

The following manuals in the OpenVMS Alpha documentation set contain information relevant to installing software:

- *POLYCENTER Software Installation Utility User's Guide*

- *OpenVMS License Management Utility Manual*

- *OpenVMS System Manager's Manual*, which includes:

  - *OpenVMS System Manager's Manual: Essentials*

  - *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*

- *Guide to OpenVMS Performance Management*

For help understanding OpenVMS error messages, see the *OpenVMS System Messages and Recovery Procedures Reference Manual* or the online HELP /MESSAGE facility.

Sending Compaq Your Comments on This Manual

We welcome your comments on this or any other Compaq Fortran manual. You can send comments to `fortran@compaq.com`.

If you have suggestions for improving a particular section or find any errors, please indicate the title, order number, and section (if available). Compaq also welcomes general comments.

Getting Help from Compaq

If you have a customer support contract and have comments or questions about Compaq Fortran software, you can contact the Compaq Customer Support Center (CSC), preferably using electronic means such as DSNlink. In the United States, customers can call the CSC at 1-800-354-9000 (see Section 3.10).

You can also send comments, questions, and suggestions for product improvements by Internet electronic mail to:

- `fortran@compaq.com`
- `cxml@compaq.com`

Please note, however, that these addresses are for informational inquiries only. They are not formal support channels.

World Wide Web Pages

If you have Internet access and a World Wide Web (WWW) browser, you are invited to view the Compaq Fortran home page, located at the following URL:

`http://www.compaq.com/fortran/`

This Web site contains information about software patch kits, example programs, and additional product information.

There is also a Web site for CXML:

`http://www.compaq.com/math/`

Conventions

Table 1 lists the conventions used in this document.

Table 1   Conventions Used in This Document

Convention	Meaning
UPPERCASE_TEXT	Uppercase letters indicate the name of a command, a file, a parameter, a procedure, or a utility.
$ **SHOW DEFAULT**	In interactive examples, prompts or displayed text appears in a monospaced font. User input appears in bold.
$	The dollar sign indicates the DCL prompt. This prompt may be different on your system.
Ctrl/x	In interactive examples, 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; for example, Ctrl/C or Ctrl/Z.
Return	In code examples, a key name is shown enclosed to indicate that you press a key on a keyboard.
[YES]	Square brackets indicate that the enclosed item is a default value in an installation prompt. Also, square brackets serve as delimiters for a directory name in a file specification.
OpenVMS, OpenVMS Alpha, (VMS)	References to OpenVMS (formerly VMS™), and OpenVMS Alpha refer to the OpenVMS Alpha operating system.
Compaq Fortran (DIGITAL Fortran 90)	References to Compaq Fortran (formerly DIGITAL Fortran 90) refer to the Compaq Fortran compiler, which fully supports the Fortran 90 and Fortran 95 standards (as well as Compaq Fortran extensions).
Compaq Fortran 77 (DIGITAL Fortran 77) (DEC Fortran)	The term Compaq Fortran 77 (formerly DEC Fortran and DIGITAL Fortran 77) refers to the Compaq Fortran 77 compiler, which supports the FORTRAN–77 standard (as well as Compaq Fortran 77 extensions).

In this manual, some version numbers are given as "V$n.n$". When you install Compaq Fortran, the actual version numbers appear on your screen.

1

Preparing for Compaq Fortran Installation

For this release of Compaq Fortran, Compaq provides two separate compilers (Compaq Fortran and Compaq Fortran 77) under one license and one name (Compaq Fortran). You can choose to install and/or use either compiler or both compilers.

By default, the FORTRAN command invokes the Compaq Fortran compiler, which supports the Fortran 90 and 95 standards as well as older versions of the Fortran language. If you choose to also install the older Compaq Fortran 77 compiler, programmers can request the Compaq Fortran 77 compiler by using the /OLD_F77 qualifier on the FORTRAN command line.

You can install the Compaq Extended Math Library (CXML) separately from Compaq Fortran, which allows you to call the CXML routines from either Compaq Fortran or Compaq Fortran 77.

You can install CXML either before or after you install Compaq Fortran. When installing Compaq Fortran, you must install the Compaq Fortran Run-Time Library (RTL) *before* Compaq Fortran (see Chapter 2).

Before starting the installation procedure in Chapter 2, you should complete the preparations explained in this chapter. This chapter includes the following sections:

- Reading the online release notes and "read first" letter (Section 1.1)

- Required operating system components (Section 1.2)

- License registration (Section 1.3)

- Installation procedure requirements, including disk space requirements (Section 1.4)

- Backing up your system disk (Section 1.5)

- Recovering from installation errors (Section 1.6)

1.1 The Software Product Library CD-ROM and Installation-Related Documentation Files

The OpenVMS Alpha Software Product Library CD-ROM (media CD-ROM) set provides the following files:

- Compaq Fortran installation kit files

- Compaq Fortran documentation files, including a "read first" cover letter, this installation guide, and other files

- Online CD-ROM documentation files in the [README] directory on the first media CD-ROM, including a CD-ROM user guide and master list of CD-ROM products

- A CDMENU utility

To determine whether the appropriate media CD-ROM is already mounted on your system, contact the appropriate system manager.

Compaq Fortran provides online release notes and an online "read first" cover letter:

- You can read the online "read first" cover letter provided on the media CD-ROM set or read the printed hardcopy letter.

- You can extract the Compaq Fortran release notes to a file and type or print them before starting Compaq Fortran installation. The Compaq Fortran release notes are also installed on your system *after* installation.

For information about using the CDMENU utility and locating the appropriate media CD-ROM and directory that contains the Compaq Fortran cover letter, see the first few steps in Chapter 2.

Once the appropriate media CD-ROM has been mounted and the appropriate Compaq Fortran documentation directory located, do one of the following:

- Use a TYPE command to display the ASCII version of the Compaq Fortran cover letter (on your screen).

- Use a PRINT command to print the ASCII or PostScript® version of the Compaq Fortran cover letter to a printer.

For information about reading the online release notes before installation, use the PRODUCT EXTRACT RELEASE_NOTES command described in Section 2.1 (step 6).

Compaq strongly recommends that you read the release notes and the cover letter before installing Compaq Fortran. They contain information about changes to the installation and use of Compaq Fortran, such as the minimum version of the OpenVMS Alpha operating system required for this release of Compaq Fortran.

After Compaq Fortran installation, the release notes are installed in:

    SYS$HELP:FORTRAN.RELEASE_NOTES

The release notes are also provided in PostScript form after installation in the following file:

    SYS$HELP:FORTRAN_RELEASE_NOTES.PS

Release notes for CXML are provided separately. After installing CXML, the CXML release notes are installed in:

    SYS$HELP:CXML-*NOTES.TXT

The CXML release notes and the CXML Reference Guide are also provided in PostScript form in the SYS$HELP directory.

1.2 Required Operating System Components

Compaq Fortran Version 7.5 requires the OpenVMS Alpha operating system Version 7.1 or higher.

Future Compaq Fortran releases may require higher versions of the operating system, as described in the online release notes or the *Read Before Installing or Using Compaq Fortran Version n.n for OpenVMS Alpha Systems* (cover) letter.

The OpenVMS Alpha operating system comes with a variety of support options (or components). To use Compaq Fortran, your system should be running a version of the OpenVMS Alpha operating system that includes the base component and the following other components:

- Programming support

- Utilities

For a complete list of the required components, see Compaq Fortran Software Product Description (SPD) on the media CD-ROM.

1.3 License Registration

Before you install and run Compaq Fortran Version 7.5 on a newly-licensed node (or cluster), you must first register a License Product Authorization Key (License PAK), using the License Management Facility (LMF). CXML does not require a License PAK. The specific LMF product names used by Compaq Fortran are listed in Table 1–1:

Table 1–1 LMF Product Names Used by Compaq Fortran

LMF Product Name	Use
FORTRAN FORTRAN90	Unlimited or Personal-Use License
FORTRAN-USER FORTRAN90-USER	Concurrent-Use License

The Compaq Fortran and Compaq Fortran 77 compilers will each accept either a FORTRAN(-USER) or FORTRAN90(-USER) PAK. It is not required that PAKs for both product names of a given license type be loaded.

The License PAK may be shipped along with the kit if you ordered the license and media together; otherwise, it is shipped separately to a location based on your license order. If you are installing Compaq Fortran as an update on a node or cluster already licensed for this software, you have already completed the License PAK registration requirements.

If you are installing prerequisite or optional software along with Compaq Fortran, review the PAK status and install the PAKs for any prerequisite or optional software *before* you install Compaq Fortran.

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

Log in to a privileged account, such as the system manager's account, SYSTEM. You have a choice of two ways to register a license:

- 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 Compaq Fortran on more than one node in a cluster, you will need to perform a license load on the other nodes after you complete this installation. See Section 3.3.

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

1.4 Installation Procedure Requirements

After you have registered and loaded the license PAK and have previously read the appropriate parts of this installation guide, the installation takes approximately 2 to 5 minutes, depending on your system configuration.

1.4.1 Installation Account Privileges and Disk Space

To install Compaq Fortran or CXML, you must be logged in to an account that has at least the following privileges enabled:

- BYPASS
- CMKRNL
- SYSLCK
- SYSPRV

Table 1–2 lists Compaq Fortran's requirements for free disk storage space.

Table 1–2 Disk Space Requirements

Kit Component	During Installation	After Installation
Compaq Fortran Compiler	28,000 blocks	28,000 blocks
Compaq Fortran 77 Compiler	12,000 blocks	12,000 blocks
Compaq Fortran Run-Time Library	10,000 blocks	500 blocks
Compaq Fortran Complete kit	**50,000 blocks**	**40,500 blocks**
Compaq Extended Math Library (optional)	150,000 blocks	150,000 blocks

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

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

For information on installing 64-bit tools support, see Section 2.3.

1.4.2 System Parameters

Installing Compaq Fortran (both compilers) requires certain system parameter settings.

The minimum number of free global pagelets (512-byte subpage unit) and global sections needed is eleven (11) global sections and approximately 20,000 contiguous free global pagelets, plus a sufficient number of contiguous free global pagelets to contain the file SYS$LIBRARY:DCLTABLES.EXE (see Section 1.4.2.1).

If the optional Compaq Extended Math Library is installed, an additional 18 global sections and 50,000 contiguous free global pagelets are required.

These values represent the number of free global pagelets and global sections required for the installation, not the total number you need to run your system and other software.

_____ **Note** _____

If you do not ensure that your system has the necessary global pagelets and global section SYSGEN parameters for the installation, the DCL tables can become corrupted in some situations.

_____

1.4.2.1 Calculating Values for GBLPAGES and GBLSECTIONS

To install and run Compaq Fortran, you must have sufficient free global pagelets and global sections.

Enter the following DCL command to determine the number of global pagelets required by SYS$LIBRARY:DCLTABLES.EXE:

```
$ DIRECTORY/SIZE SYS$LIBRARY:DCLTABLES.EXE
```

This command returns the size (in blocks) of SYS$LIBRARY:DCLTABLES.EXE. As an approximation, use this figure as the number of global pagelets for the file.

You can use the WRITE command with the F$GETSYI lexical function to find the number of free contiguous global pagelets and free global sections. The following example shows how to get this information at your terminal (the default for SYS$OUTPUT):

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

If the value of free global pagelets or global sections is less than the required value (see Section 1.4.2), you must increase the system parameter setting.

Section 1.4.2.2 describes the procedures for increasing these values using AUTOGEN.

1.4.2.2 Changing System Parameter Values with AUTOGEN

If you do not have enough free global pagelets or free global sections to install Compaq Fortran, you can use the AUTOGEN command procedure to increase the GBLPAGES or GBLSECTIONS 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
```

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 specifies the name of the parameter and its value. To modify incremental parameters such as GBLPAGES and GBLSECTIONS, use the ADD_ prefix.

After you make all your changes, exit from the editor.

When you execute the AUTOGEN procedure to recalculate your system parameters, AUTOGEN uses the information in your MODPARAMS.DAT file and also can automatically adjust some of the SYSGEN parameters based on the consumption of resources since the last reboot.

For information about using AUTOGEN and its command-line parameters, see the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*.

1.5 Backing Up Your System Disk

Compaq 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 *Using VMS BACKUP* manual.

1.6 Recovering from Installation Errors

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

- The operating system version is incorrect.

- The privileges or disk space for successful installation are insufficient.

For descriptions of error messages generated by these and related conditions, see the OpenVMS Alpha documentation on system messages and software installation or the online HELP/MESSAGE command. Take the appropriate action described in the message.

For information on system requirements for installing Compaq Fortran, see Section 1.2.

For a list of problems that can cause an unsuccessful installation, see Section 3.9.

To report a problem to Compaq, see Section 3.10.

2

Installing Compaq Fortran

This chapter describes:

- How to read the online release notes before installation.

- How to install Compaq Fortran and CXML using POLYCENTER®
  Software Installation (PCSI) software. PCSI software is bundled with the
  OpenVMS operating system.

- Information about installing optional tools that support 64-bit addressing
  of static data.

Before you start the installation, read Chapter 1, which describes the general
options and requirements for installing Compaq Fortran. After you complete
installation, see Chapter 3.

2.1 Compaq Fortran Installation Instructions

The installation procedure loads Compaq Fortran product distribution files on
to the system disk on the system where you perform the installation.

_____ **Note** _____

You must first install the Compaq Fortran Run-Time Library (RTL)
before you install the Compaq Fortran compiler.

_____

Follow these steps to install Compaq Fortran from the OpenVMS Alpha
Software Products Library CD-ROM set:

1. Log in to a privileged account on the system (or cluster) where you will
   install Compaq Fortran. This account *must* have the following privileges
   enabled:

   - BYPASS

   - CMKRNL

   - SYSLCK

- SYSPRV

Do not proceed with the installation unless your account has the BYPASS, CMKRNL, SYSLCK, and SYSPRV privileges enabled. If your process has the SETPRV privilege, you can enable these privileges by typing the following command:

```
$ SET PROCESS/PRIVILEGE=(BYPASS,CMKRNL,SYSLCK,SYSPRV)
```

To check whether your process has these privileges enabled, type the following command:

```
$ SHOW PROCESS/PRIVILEGES
```

2. To obtain the kit directory location of the Compaq Fortran product distribution files on the appropriate OpenVMS Alpha Software Product Library CD-ROM (media CD-ROM), do one of the following:

- Use the CDMENU utility provided on the media CD-ROM.
- View the CD-ROM master index file on the media CD-ROM.
- Contact the appropriate system manager.

For information about using the CDMENU utility and the CD-ROM files on the media CD-ROM set, see the *Software Product Library CD–ROM User's Guide* (media CD-ROM user guide), which accompanies the media CD-ROM distribution kit. The media CD-ROM user guide and CD-ROM master index file are provided as online files in the [README] directory on the first media CD-ROM.

3. To determine whether the appropriate media CD-ROM is already mounted on your system, type the following command:

```
$ SHOW DEVICE DKA400
```

_____ **Note** _____

DKA400 is the device name used in examples in this document to show where the appropriate media CD-ROM has been mounted.

_____

4. If the media CD-ROM containing the Compaq Fortran installation files is not mounted, either contact the appropriate system manager or insert the appropriate media CD-ROM (write down the volume label) into an available CD-ROM drive. Type the appropriate MOUNT command to mount the media CD-ROM (omit the /FOREIGN qualifier), such as the following:

```
$ MOUNT DKA400 label
```

Where *label* is the volume label of that media CD-ROM.

5. To check that you have located the correct CD-ROM device and directory, use the following DIRECTORY command:

```
$ DIRECTORY *.PCSI

Directory DKA400:[dir.subdir]

DEC-AXPVMS-FORRTL-Vnnnn-x-1.PCSI  DEC-AXPVMS-FORTRAN-Vnnnn-x-1.PCSI

Total of 2 files.
```

6. To extract the Compaq Fortran online release notes before you install Compaq Fortran, type the following command:

```
$ PRODUCT EXTRACT RELEASE_NOTES FORTRAN /SOURCE=disk:[dir] -
$_/FILE=FORTRAN.RELNOTES
```

In this command, **disk:[dir]** is the specification of the disk and directory containing the product installation files. If your process default directory is the directory on the CD-ROM that contains the Compaq Fortran product distribution files, you can specify the /SOURCE directory as /SOURCE=[].

You can view or print the file FORTRAN.RELNOTES before you continue with the installation (next command). For example:

```
$ TYPE/PAGE FORTRAN.RELNOTES
```

7. In addition to the Compaq Fortran compiler (development) kit, Compaq Fortran also provides a separate Run-Time Library kit. The Compaq Fortran Run-Time Library (FORRTL) may be freely redistributed on other OpenVMS Alpha systems provided the terms specified in the Software Product Description (SPD) are honored. A copy of the Compaq Fortran SPD can be found in the [.DOCUMENTATION] subdirectory of the Compaq Fortran product directory on the OpenVMS Alpha Software Product Library CD-ROM.

The Compaq Fortran Run-Time Library kit contains a shared Compaq Fortran and Compaq Fortran 77 Run-Time Library (Fortran RTL) needed to execute (RUN) Fortran programs. The Fortran RTL kit provided with Compaq Fortran compiler media contains changes needed to run Compaq Fortran programs that are not included in the Fortran RTL version supplied with the OpenVMS Alpha operating system Version 7.3 or earlier.

The Fortran RTL kit includes the shareable image DEC$FORRTL.EXE, which is compatible with DEC Fortran for OpenVMS Alpha Version 7.1 or later releases. This compatibility allows you to copy Fortran executable images from other OpenVMS systems and run them on systems where the DEC$FORRTL.EXE from the Compaq Fortran kit is installed.

The Fortran RTL kit also includes an updated version of the Math Library shareable image DPML$SHR.EXE which includes support for the COMPLEX*32 datatype.

To run Compaq Fortran images on other OpenVMS Alpha systems, you *must* install the Fortran RTL kit on those OpenVMS Alpha systems. This Fortran RTL kit can be installed on other licensed OpenVMS systems—see the Compaq Fortran Software Product Description (SPD) for details.

An OpenVMS Alpha release after Version 7.3 includes RTL components which are sufficient to run both Compaq Fortran and Compaq Fortran 77 applications. The RTL kit provided with Compaq Fortran will not replace components provided by OpenVMS Alpha if the existing components are newer.

To install the Compaq Fortran Run-Time Library, type the following PRODUCT INSTALL command:

```
$ PRODUCT INSTALL FORRTL /SOURCE=disk:[dir]
```

Where `disk:[dir]` is the specification of the disk and directory containing the product installation files.

The following text appears for a Run-Time Library installation:

```
The following product has been selected:
    DEC AXPVMS FORRTL V7.x-x              Layered Product

Do you want to continue? [YES] Return

Configuration phase starting ...

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

DEC AXPVMS FORRTL V7.x-x: Compaq Fortran Run-Time Library

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    This software is produced by Compaq Computer Corporation

    This software is licensed under the OpenVMS product license

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

    Copyright 2002 Compaq Information Technologies Group, L.P.
```

```
        Compaq, the Compaq logo, Alpha and OpenVMS are trademarks of
        Compaq Information Technologies Group, L.P. in the U.S. and/or
        other countries.

        Confidential computer software. Valid license from Compaq
        required for possession, use or copying.  Consistent with
        FAR 12.211 and 12.212, Commercial Computer Software, Computer
        Software Documentation, and Technical Data for Commercial
        Items are licensed to the U.S. Government under vendor's
        standard commercial license.

     Ignore PSCI-I-RETAIN messages

      During installation of this product, you may see messages
      of the form:

      %PCSI-I-RETAIN,  'object' 'object-name' was not replaced
         because 'object' from kit does not have higher generation
         number

      These messages indicate that the Run-Time Library components
      on this kit are older than those already installed on your
      OpenVMS system.  This is a normal situation and the messages
      can be ignored.

      You may also see these messages when installing a new
      version of OpenVMS. In this case, it indicates that the
      OpenVMS versions of the Run-Time Library components are older
      than those already on the system.  This will occur with
      installations of OpenVMS 7.3 or earlier.  These messages can
      be ignored also.

      Do you want to continue? [YES] Return

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

 Execution phase starting ...

 The following product will be installed to destination:
     DEC AXPVMS FORRTL V7.x-x            DISK$diskname:[VMS$COMMON.]

 Portion done: 0%...20%...30%...40%...50%...60%...70%...80%...90%...100%

 The following product has been installed:
     DEC AXPVMS FORRTL V7.x-x            Layered Product

 %PCSI-I-IVPEXECUTE, executing test procedure for DEC AXPVMS
    FORRTL V7.x-x ...
 %PCSI-I-IVPSUCCESS, test procedure completed successfully

 DEC AXPVMS FORRTL V7.x-x: Compaq Fortran Run-Time Library

     Release notes are in SYS$HELP:FORRTL.RELEASE_NOTES
```

8. Installation of the Run-Time Library kit takes about one minute (depending
   on your system). When installation has been completed, the DCL $ prompt
   reappears.

9. If DEC Fortran 90 Version 2.0 was previously installed on this system, it must be removed before Compaq Fortran is installed. To determine if DEC Fortran 90 is present, type the following command:

```
$ PRODUCT SHOW PRODUCT FORTRAN90
```

If DEC Fortran 90 is present, something similar to the following text appears:

```
PRODUCT
-------
DEC AXPVMS FORTRAN90 Vn.n

1 item found
```

If DEC Fortran 90 is not present, the following text appears:

```
PRODUCT
-------

0 items found
```

If DEC Fortran 90 is present, remove it by typing the PRODUCT REMOVE command. Specify the product name FORTRAN90. For example:

```
$ PRODUCT REMOVE FORTRAN90
```

The following text appears:

```
The following product has been selected:
    DEC AXPVMS FORTRAN90 V2.0

%PCSI-E-CONREMUNR, optionally remove product DEC AXPVMS FORRTL V2.0
 that is no longer required by another product
Do you want to take this action? [NO] Return
Do you want to continue? [YES] Return
The following product will be removed:
    DEC AXPVMS FORTRAN90 V2.0
%PCSI-I-VOLINFO, estimated space information for volume DISK$vvvvvvvv
-PCSI-I-VOLSPC, -nnnnn required; nnnnnnn available; nnnnnnn net
Portion done: 0%...50%...60%...70%...80%...100%
The following product has been removed:
    DEC AXPVMS FORTRAN90 V2.0
```

For more information on removing Compaq Fortran, see Section 3.7.

10. To install the Compaq Fortran compilers, type the following PRODUCT INSTALL command:

```
$ PRODUCT INSTALL FORTRAN /SOURCE=disk:[dir]
```

Where **disk:[dir]** is the specification of the disk and directory containing the product installation files.

The following text appears:

```
The following product has been selected:
    DEC AXPVMS FORTRAN V7.x-x           Layered Product

Do you want to continue? [YES] Return

Configuration phase starting ...

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

DEC AXPVMS FORTRAN V7.x-x: Compaq Fortran for OpenVMS Alpha Systems

    Copyright 2002 Compaq Information Technologies Group, L.P.

    This software product is sold by Compaq Computer Corporation

    PAKs used: FORTRAN or FORTRAN-USER

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

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      FAR 12.211 and 12.212, Commercial Computer Software, Computer
      Software Documentation, and Technical Data for Commercial
      Items are licensed to the U.S. Government under vendor's
      standard commercial license.

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

Execution phase starting ...

The following product will be installed to destination:
    DEC AXPVMS FORTRAN V7.x-x           DISK$diskname:[VMS$COMMON.]

Portion done: 0%...40%...70%...80%...90%...100%

The following product has been installed:
    DEC AXPVMS FORTRAN V7.x-x           Layered Product

%PCSI-I-IVPEXECUTE, executing test procedure for DEC AXPVMS
    FORTRAN V7.x-x ...
%PCSI-I-IVPSUCCESS, test procedure completed successfully

DEC AXPVMS FORTRAN V7.x-x: Compaq Fortran for OpenVMS Alpha Systems

    Execute SYS$STARTUP:FORT$STARTUP.COM on all other VMScluster nodes

    Type HELP FORTRAN Release_notes for release notes location

    Install Compaq Extended Math Library (CXML) if desired
```

```
    If you wish to install the Compaq Extended Math Library, which
    contains advanced mathematics routines such as BLAS, FFT and
    vector operations, install the CXML kit from the media CD-ROM.
    See the Compaq Fortran Installation Guide for more details.

  Install DEBUG64 (ADB073) to enable 64-bit addressing support

    If your applications will be allocating and accessing data in
    64-bit address space, be sure to install the DEBUG64 kit (ADB073) from
    the media CD-ROM.  This provides enhanced debug and linker support.
    See the Compaq Fortran Installation Guide for more details.

  Insert the following lines in SYS$MANAGER:SYSTARTUP_VMS.COM:
    @SYS$STARTUP:FORT$STARTUP
```

11. Installation takes about 2-5 minutes (depending on your system). When
    installation has been completed, the DCL $ prompt reappears.

12. To obtain a list of files installed, type the following command:

    $ **PRODUCT SHOW OBJECT /PRODUCT=(FORTRAN, FORRTL)**

To use other features of the PCSI utility, see the *POLYCENTER Software
Installation Utility User's Guide*.

2.2 Installing Compaq Extended Math Library

The Compaq Extended Math Library (CXML), an optional component, is a set of
scientific subroutines optimized for Alpha systems, organized into the following
libraries:

- BLAS — Basic Linear Algebra Subprograms

- LAPACK — An extensive library of Linear System and Eigenproblem
  Solvers

- Sparse Linear System Solvers — A library of direct and iterative sparse
  solvers

- Signal Processing — FFTs, sine/cosine transforms, convolution, correlation
  and filters

- SCIPORT — A library of routines compatible with Cray's SCILIB V7.

Further details about CXML can be found at the Compaq Math Library Web
site at http://www.compaq.com/math or in the CXML online documentation.

Before you install the Compaq Extended Math Library (CXML), be aware that
the account and privileges requirements are the same as for Compaq Fortran.
Unless you are installing CXML from the same account immediately after
installing Compaq Fortran, please review steps 1 through 6 in Section 2.1 to
ensure you have the necessary privileges, can locate the CXML installation

files (in the same directory as the Fortran files), and can print out the CXML release notes before installation.

To install the Compaq Extended Math Library, type the following PRODUCT INSTALL command:

```
$ PRODUCT INSTALL CXML /SOURCE=disk:[dir]
```

Where **disk:[dir]** is the specification of the disk and directory containing the product installation files.

The following text appears:

```
The following product has been selected:
    DEC AXPVMS CXML V3.xx-x          Layered Product [Installed]

Do you want to continue? [YES]    Return

Configuration phase starting ...

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

DEC AXPVMS CXML V3.xx-x: Compaq Extended Math Library for OpenVMS Alpha
Systems

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    This software product is sold by Compaq Computer Corporation

* This product does not have any configuration options.

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    FAR 12.211 and 12.212, Commercial Computer Software, Computer
    Software Documentation, and Technical Data for Commercial
    Items are licensed to the U.S. Government under vendor's
    standard commercial license.

Execution phase starting ...

The following product will be installed to destination:
    DEC AXPVMS CXML V3.xx-x                DISK$diskname:[VMS$COMMON.]

Portion done: 0%...40%...90%...100%

The following product has been installed:
    DEC AXPVMS CXML V3.xx-x                Layered Product
```

```
%PCSI-I-IVPEXECUTE, executing test procedure for DEC AXPVMS CXML
   V3.xx-x ...
%PCSI-I-IVPSUCCESS, test procedure completed successfully

DEC AXPVMS CXML V3.xx-x: Compaq Extended Math Library for OpenVMS Alpha Systems

    Release notes at SYS$HELP:CXML-V3xxx-RELEASE-NOTES.TXT.

    Insert the following lines in SYS$MANAGER:SYSTARTUP_VMS.COM:
        @SYS$STARTUP:cxml$startup
$
```

Installation takes about 2-5 minutes (depending on your system). When installation has been completed, the DCL $ prompt reappears.

To obtain a list of files installed, type the following command:

$ **PRODUCT SHOW OBJECT /PRODUCT=CXML**

2.3 Installing 64-Bit Tools Support

If you will be using 64-bit address space data in your applications, you should install the enhanced 64-bit OpenVMS tools on your system, which include the OpenVMS Debugger (DEBUG64) and OpenVMS Linker (LINKER64).

If your system has OpenVMS Version 7.2 installed, and you want to use the ability to allocate static data (local variables and COMMON) in 64-bit address space, you must install the DEBUG64 (ADB073) kit as it provides a new linker, LINKER64, which supports this new feature.

OpenVMS Version 7.2 supports 64-bit allocation of static data, but does not provide LINKER64. OpenVMS versions prior to Version 7.2 do not support 64-bit allocation of static data.

If you have a version of OpenVMS later than Version 7.2, please check its release notes to see if DEBUG64 and LINKER64 functionality is already included. If the DEBUG64 kit is installed, LINKER64 is made the system default linker. It can be used as a general replacement for the OpenVMS-supplied linker.

DEBUG64 may be installed on OpenVMS Versions 6.2 and later. (Note that Compaq Fortran supports OpenVMS Version 7.1 and later.) The DEBUG64 kit is provided on your media CD-ROM in the same directory where the Fortran compiler kit files are located.

For more details on the capabilities of DEBUG64, see the release notes file ADB073.RELEASE_NOTES. You can view the release notes before installation (see below). After installation, the release notes are installed on the system in SYS$HELP:ADB073.RELEASE_NOTES.

Follow these steps to install DEBUG64:

1. Log in to a privileged account on the system (or cluster) where you will install Compaq Fortran. This account *must* have the following privileges enabled:

   - BYPASS

   - CMKRNL

   - SYSLCK

   - SYSPRV

   Do not proceed with the installation unless your account has the BYPASS, CMKRNL, SYSLCK, and SYSPRV privileges enabled. If your process has the SETPRV privilege, you can enable these privileges by typing the following command:

   ```
   $ SET PROCESS/PRIVILEGE=(BYPASS,CMKRNL,SYSLCK,SYSPRV)
   ```

   To check whether your process has these privileges enabled, type the following command:

   ```
   $ SHOW PROCESS/PRIVILEGES
   ```

2. To obtain the kit directory location of the Compaq Fortran product distribution files on the appropriate OpenVMS Alpha Software Product Library CD-ROM (media CD-ROM), do one of the following:

   - Use the CDMENU utility provided on the media CD-ROM.

   - View the CD-ROM master index file on the media CD-ROM.

   - Contact the appropriate system manager.

   For information about using the CDMENU utility and the CD-ROM files on the media CD-ROM set, see the *Software Product Library CD–ROM User's Guide* (media CD-ROM user guide), which accompanies the media CD-ROM distribution kit. The media CD-ROM user guide and CD-ROM master index file are provided as online files in the [README] directory on the first media CD-ROM.

3. To determine whether the appropriate media CD-ROM is already mounted on your system, type the following command:

```
$ SHOW DEVICE DKA400
```

—————————————————————— **Note** ——————————————————————

DKA400 is the device name used in examples in this document to show
where the appropriate media CD-ROM has been mounted.

———

4. If the media CD-ROM containing the Compaq Fortran installation files
   is not mounted, either contact the appropriate system manager or insert
   the appropriate media CD-ROM (write down the volume label) into an
   available CD-ROM drive. Type the appropriate MOUNT command to
   mount the media CD-ROM (omit the /FOREIGN qualifier), such as the
   following:

   ```
   $ MOUNT DKA400 label
   ```

   Where *label* is the volume label of that media CD-ROM.

5. To check that you have located the correct CD-ROM device and directory,
   use the following DIRECTORY command:

   ```
   $ DIRECTORY ADB*.*

   Directory DKA400:[dir.subdir]

   ADB073.A        ADB073.B            ADB073.C        ADB073.D

   Total of 3 files.
   ```

6. To extract the DEBUG64 online release notes before you install the
   DEBUG64 kit, type the following command:

   ```
   $ @SYS$UPDATE:VMSINSTAL ADB073 disk:[dir] OPTIONS N
   ```

   The release notes are copied to SYS$HELP:ADB073.RELEASE_NOTES.
   VMSINSTAL then displays the following text:

   ```
   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]:  Return
   ```

   Select the option number needed and press Return (default is item 2).

   You are given the opportunity to proceed with the installation or exit
   immediately.

7. To install DEBUG64, type the following command:

   $ **@sys$update:vmsinstal adb073 disk:[dir]**

   The following text appears:

   ```
               OpenVMS AXP Software Product Installation Procedure V7.3

   It is 18-DEC-2001 at 15:05.

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

   * Are you satisfied with the backup of your system disk [YES]? Return
   The following products will be processed:

     ADB V7.3

           Beginning installation of ADB V7.3 at 15:05

   %VMSINSTAL-I-RESTORE, Restoring product save set A ...
   %VMSINSTAL-I-RELMOVED, Product's release notes have been moved to SYS$HELP.

       **************************************************************************
       OpenVMS Alpha Debug V7.3

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       Software Documentation, and Technical Data for Commercial
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       standard commercial license.

       **************************************************************************

       This kit installs Debug version V7.3.  It will install on Alpha OpenVMS
       V6.2 to V7.3 systems.

       This kit requires an installed DCE for its client/server configurations
       (see release notes).  If DCE is not installed, the "server" portion of
       the debugger cannot be linked and a warning is printed during the
       installation, for example, "%ADX-W-LINKABORT, NO DEBUGSRVSHR linked,
       SYS$LIBRARY:DCE$LIB_SHR missing (install DCE)".  You can safely ignore
       this message.  The normal operation of the debugger is not affected,
       however, the client/server mode will NOT be operational.

       If DECWindows Motif V1.2 is installed a new Heap Analyzer will be also
       installed on V7.1 or later systems.
   ```

If your system is later upgraded from V6 to V7 or if DCE or MOTIF are
later installed, then this kit MUST be rerun, i.e. the V7.3 debuggers
MUST be reinstalled.

On V7.1-2 and later systems this kit will also optionally install new
process dump and process dump analysis tools: new process dump analysis
DEBUG kernel, new SDA, and new IMGDMP (image dump). Old style process
dumps are NOT compatible with this new style. New process dumps can be
analyzed through the new kept debugger ANALYZE/PROCESS_DUMP/IMAGE_PATH
command (enter it at the DBG> prompt). The DCL ANALYZE/PROCESS_DUMP
command can also be used to invoke the debugger process dump analysis.
You can aslo view new process dumps with the new SDA through the DCL
ANALYZE/CRASH command.

If you chose to install the new process dump and process dump analysis
tools, then new System Code and System Dump Debuggers (SCD and SDD) ARE
also installed.

The debuggers and (optionally) process dump tools installed by this kit
coexist with your regular system supplied ones, that is, it does NOT
replace them. Procedures are included that will allow you to set up to
these new tools or the regular system ones. However, the kit will
replace any previous V7.3 versions that may be installed AND it will
request to remove any earlier network kit debuggers, e.g. V72X.

"%INSTALL-I-NONSHRADR, image installed ignoring '/SHARE=ADDRESS'...
SYSTEM-F-NOPRIV, insufficient privilege or object protection violation"
errors for TRACE and IMGDMP may occur during setup for the IVP. These
errors can be safely ignored for the IVP (which does not actually test
TRACE or IMGDMP). However, to correct TRACE and IMGDMP installation
SYS$STARTUP:DEBUG$STARTUP_V73 must be run from a privileged account
after vmsinstal completes.

* Do you want to install the new process dump tools [YES]? Return

This installation should take 15 minutes or less.

```
* Do you want to run the IVP after the installation [YES]?) Return
* Do you want to run the interactive DECwindows Motif IVP? [NO]?) Return
* Do you want to purge files replaced by this installation [YES]?) Return
* Do you want to remove obsolete versions of network debuggers (recommended)
    [YES]?) Return
%ADB-I-DONEASK, No further questions will be asked during this installation.
%VMSINSTAL-I-RESTORE, Restoring product save set B ...
%VMSINSTAL-I-RESTORE, Restoring product save set C ...
%VMSINSTAL-I-RESTORE, Restoring product save set D ...
%ADB-I-ENDRESTORE, All Debugger savesets have been restored.
%ADB-I-LINKING, Linking V7 images.
%ADB-I-LINKDONE, DEBUGSHR has been linked.
%ADB-I-LINKDONE, DEBUG has been linked.
%ADB-I-LINKDONE, DEBUGUISHR has been linked.
%ADB-I-LINKDONE, DEBUGSRVSHR has been linked.
%ADB-I-LINKDONE, HA_MAIN has been linked.
%ADB-I-LINKDONE, HA_KERNEL has been linked.
%ADB-I-LINKDONE, TRACE has been linked.
%ANALYZE-I-ERRORS, VMI$ROOT:[SYS$LDR]SYS$BASE_IMAGE.EXE;1      0 errors
%ADB-I-LINKDONE, SDA has been linked.
%ADB-I-LINKDONE, IMGDMP, IMGDMP_RIGHTS, and PRGDEVMSG have been linked.
%ADB-I-LINKDONE, Process dump DEBUG kernel has been linked.
%ADB-I-LINKDONE, System dump DEBUG kernel has been linked.
%ADB-I-LINKDONE, System code DEBUG kernel has been linked.
%ADB-I-CLEANUP, Cleanup has been performed.
%ADB-I-PROHELP, Providing Debugger Help files...
%ADB-I-PROMSG, Providing Debugger message image...
%ADB-I-PROMSG, Providing Debugger .CLD file...
%ADB-I-PROEXE, Providing Debugger files...
%ADB-I-PROEXE, Providing Heap Analyzer files...
%ADB-I-PROEXE, Providing new process dump tools...
%ADB-I-UNINSTALL, Uninstalling obsolete network kit debuggers
OpenVMS Debugger Uninstall Procedure
Copyright 2002 Compaq Information Technologies Group, L.P.
OpenVMS Debugger Uninstall Procedure
Copyright 2002 Compaq Information Technologies Group, L.P.
OpenVMS Debugger Uninstall Procedure
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OpenVMS Debugger Uninstall Procedure
Copyright 2002 Compaq Information Technologies Group, L.P.
%ADB-I-PROMSG, Providing startup files ...
```

If you want the debuggers installed by this kit to be the default system
debuggers:

-   Add the following line to the system startup procedure:

        $ @SYS$STARTUP:DEBUG$STARTUP_V73.COM V73

    You should remove any other *DEBUG$STARTUP*.COM reference.

-   Enter the following DCL command from a privileged account on each
    and every Alpha node of your VMScluster that you wish to upgrade:

```
                    @SYS$STARTUP:DEBUG$STARTUP_V73.COM V73

         Note that this is a /SYSTEM table setup (also see
         SYS$STARTUP:DEBUGSETUP.COM) and modifies your DCL command tables.
         The DCL DEBUG /CLIENT and /SERVER switches on pre V7.2 systems
         may not be seen and the /KEPT invocation may not be redirected
         for active processes (until they are logged-off and restarted).

    If you want the regular system supplied debuggers (and process dump tools)
    to be the default, then do the same as above but use "VMS" as the input
    parameter, for example:

                    @SYS$STARTUP:DEBUG$STARTUP_V73.COM VMS

    Users can also individually and dynamically switch debuggers (and process
    dump tools) by using SYS$STARTUP:DEBUGSETUP.COM.  It's input options are
    VMS, V73, or UNSET.  It also needs the logical table /JOB or /SYSTEM
    switch.  For example:

                    @SYS$STARTUP:DEBUGSETUP.COM V73 /JOB

%ADB-I-PROIVP, Providing test files for IVP...

    The Debugger IVP has been moved to the SYS$TEST directory.  To run the
    IVP after installation, first make sure you are setup to use the V73
    debugger, e.g. execute the command "@SYS$STARTUP:DEBUGSETUP V73 /JOB"
    Then, run the character cell IVP by executing the command
    "@SYS$TEST:DBG$IVP.COM" or, if DECWindows Motif has been installed on
    your system, run the interactive DECWindows Motif IVP by executing the
    command "@SYS$TEST:DBG$DW$IVP.COM"

%ADB-I-INSTALLDONE, OpenVMS Alpha Debug V7.3 installation done
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...
OpenVMS Debugger Startup Procedure
Copyright 2002 Compaq Information Technologies Group, L.P.
OpenVMS Debugger Setup Procedure
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OpenVMS Debugger Setup Procedure
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    Beginning the Debug V7.3 Verification Procedure

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    standard commercial license.


    Debug verification procedure successful.
```

```
        Installation of ADB V7.3 completed at 15:08
    Adding history entry in VMI$ROOT:[SYSUPD]VMSINSTAL.HISTORY
    Creating installation data file: VMI$ROOT:[SYSUPD]ADB073.VMI_DATA

        VMSINSTAL procedure done at 15:08)
```

8. Edit your system startup procedure as described in the above displayed text.

3

After Installing Compaq Fortran

The following tasks can be performed after Compaq Fortran is installed:

- Running the Installation Verification Procedure (IVP) separately (Section 3.1)

- Modifying the system-wide startup command procedure (Section 3.2)

- Making the product usable on a VMScluster (Section 3.3)

- Making the recently installed FORTRAN command available to users after installation (Section 3.4)

- Setting user account quotas (Section 3.5)

- Enhancing performance (Section 3.6)

- Removing Compaq Fortran (Section 3.7)

- CXML Post-Installation Startup Options (Section 3.8)

- Troubleshooting tips (Section 3.9)

- Getting help and reporting problems (Section 3.10)

3.1 Running the Installation Verification Procedure Separately

The Compaq Fortran Installation Verification Procedure (IVP) runs automatically *during* Compaq Fortran installation. Similarly, the Compaq Extended Math Library (CXML) IVP runs during CXML installation.

If system problems occur, you should run the Compaq Fortran IVP *separately* to ensure the integrity of the installed files. To run the IVP, type the following command:

```
$ @SYS$TEST:FORT$IVP.COM
```

If any problems are encountered, a message such as the following appears:

```
Compaq Fortran Version 7.n TEST FAILED
```

Similarly, you can run the CXML IVP after installation, or at other times, to ensure the integrity of installed files if system problems have occurred. You need system privileges to run the CXML IVP. To run the CXML IVP, execute the following command procedure:

```
$  @SYS$TEST:CXML_IVP.COM
```

If the IVP runs successfully, you will see the following display:

```
CXML-I-IVP> Completed CXML Vnnnn Installation Verification Procedure
```

3.2 Modifying the System-Wide Startup Command Procedure

Add the following lines to the system-wide startup file (if you have not done so previously), such as the file SYS$MANAGER:SYSTARTUP_VMS.COM or a command procedure that it invokes:

```
$       @SYS$STARTUP:FORT$STARTUP
$       @SYS$STARTUP:CXML$STARTUP
```

These command procedures install Compaq Fortran and CXML images in memory and perform related actions.

The Fortran startup procedure line does not take any parameters (arguments).

The CXML startup procedure line lets you specify certain parameters to:

- Control the default CXML link library
- Specify names of CXML shareable images to be installed as shared images
- Specify names of CXML shareable images to be installed as resident images

Among other things, inserting this line in the startup procedure makes the correct CXML library available automatically, eliminating the need for the user to explicitly specify the CXML link library on the LINK command line.

In addition, individual users can select a user-specific default CXML link library, by executing the SYS$LIBRARY:CXML$SET_LIB command procedure.

For more information on the CXML startup procedure arguments and specifying a user-specific default CXML link library, see Section 3.8.

3.3 VMScluster Considerations

If you want to run Compaq Fortran on multiple nodes of a VMScluster, first check to see that you have the appropriate software license (see Section 1.3). Then perform the following steps *after* you install Compaq Fortran:

1. Issue the LICENSE LOAD command, as described in the *OpenVMS License Management Utility Manual*, to activate the license on each node in the VMScluster on which Compaq Fortran is to be executed.

2. The commands in this step should be executed on all cluster nodes, whether or not they are licensed to use Compaq Fortran; failure to do so may cause unexpected errors for users.

---------------- **Note** ----------------

If you are using a dual-architecture (VAX® and Alpha systems) heterogeneous cluster, before executing these commands, make sure the appropriate logical names have been set to define the scope of the SYSMAN DO commands. For more information, see the *OpenVMS System Manager's Manual*.

While logged in as SYSTEM, or as another username that has the CMKRNL and SYSPRV privileges enabled, use the OpenVMS SYSMAN utility to make the new versions of shareable images available, as follows:

```
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> SET ENVIRONMENT/CLUSTER
%SYSMAN-I-ENV, current command environment:
        Clusterwide on local cluster
        Username SYSTEM       will be used on nonlocal nodes
SYSMAN> DO INSTALL REPLACE SYS$LIBRARY:DCLTABLES.EXE
%SYSMAN-I-OUTPUT, command execution on node NODE1
%SYSMAN-I-OUTPUT, command execution on node NODE2
SYSMAN> DO INSTALL REPLACE SYS$LIBRARY:DEC$FORRTL.EXE
%SYSMAN-I-OUTPUT, command execution on node NODE1
%SYSMAN-I-OUTPUT, command execution on node NODE2
SYSMAN> DO INSTALL REPLACE SYS$LIBRARY:DPML$SHR.EXE
%SYSMAN-I-OUTPUT, command execution on node NODE1
%SYSMAN-I-OUTPUT, command execution on node NODE2
```

If any of the INSTALL commands fail, reboot the affected node.

The SYSMAN utility will cause each DO command to be executed on all nodes of the local cluster.

3. The SYS$STARTUP:FORT$STARTUP.COM file installs the compilers as a known image. This command procedure file should be executed on all cluster nodes using the following DO command:

```
SYSMAN> DO @SYS$STARTUP:FORT$STARTUP
%SYSMAN-I-OUTPUT, command execution on node NODE1
%SYSMAN-I-OUTPUT, command execution on node NODE2
```

4. Finally, exit from SYSMAN.

```
SYSMAN> EXIT
$
```

3.4 Making the FORTRAN Command Available After Installation

Compaq Fortran is now installed and can be invoked by all users with the FORTRAN command.

The installation procedure modifies the DCL command table so that the FORTRAN commands are recognized and processed. However, the previous command table is still in effect for those users who are currently logged in.

All logged-in users who want to use the FORTRAN command must log out and log in again, or use the following DCL command:

```
$ SET COMMAND /TABLES=SYS$LIBRARY:DCLTABLES
```

3.5 User Account Requirements

No special privileges are needed to use Compaq Fortran. There is no benefit from installing the compilers with privileges.

To use Compaq Fortran, a user account does not need to meet any special quota requirements. However, for users who will be compiling very large programs (many program units compiled together) or running very large performance-critical programs, consider the adjusting working set (WSDEF, WSQUOTA, WSEXTENT) and page file (PGFLQUOTA) account quotas to improve performance.

Use the OpenVMS Authorize Utility from a suitably privileged account to change the process quotas in the user authorization file (UAF). Some sites may restrict the use of the Authorize Utility to certain accounts or people.

After the quotas for the account have been changed, the user should log out of the account and log in again for the new quotas to take effect.

For information on using the Authorize Utility, see the *OpenVMS System Manager's Manual: Essentials*.

3.6 Enhancing Compaq Fortran Performance

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

After you install Compaq Fortran, you might want to adjust your system to enhance performance or lower the use of some system resources.

If users will be *compiling* very large programs (many program units compiled together) or *running* very large performance-critical programs, consider the following:

- Check that adequate page file space exists. Large programs need more virtual memory during compilation and execution than small programs. Use the INSTALL command to extend an existing page file or create one or more new page files.

- The SYSGEN parameter virtual page count is related to the total amount of page file space. If you create more page file space, review the virtual page count parameter and increase it if necessary.

- The SYSGEN parameter maximum working set (WSMAX) might also be checked if a larger process working set is needed.

For more information on page file use and SYSGEN parameters, see the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*. For information about system tuning and performance investigation, see the *Guide to OpenVMS Performance Management*.

3.7 Removing Compaq Fortran

To remove Compaq Fortran from the system, use the following command:

```
$ PRODUCT REMOVE FORTRAN
```

You may be asked if you would like to also remove the FORRTL product. Compaq recommends that you answer NO to this prompt.

After removing Compaq Fortran from the system, remove the call to SYS$STARTUP:FORT$STARTUP.COM from your system startup procedure.

To remove Compaq Extended Math Library from the system, use the following command:

```
$ PRODUCT REMOVE CXML
```

After removing Compaq Extended Math Library from the system, remove the call to SYS$STARTUP:CXML$STARTUP.COM from your system startup procedure.

3.8 CXML Post-Installation Startup Options

As part of the post-installation process described in Section 3.2, you need to add the following line to your system's startup procedure:

```
@SYS$STARTUP:CXML$STARTUP
```

Among other things, inserting this line in the startup procedure will make the correct CXML library available automatically, eliminating the need for the user to explicitly specify the CXML link library on the LINK command line.

In addition, individual users can select a user-specific default CXML link library, by executing the SYS$LIBRARY:CXML$SET_LIB command procedure, as described in Section 3.8.2.

This command procedure has three system-wide default parameters, which you can optionally change (as described below). The default parameters control the following things:

- The first parameter sets the default CXML link library. Its default value is "IEEE".

- The second parameter is a list of the names of CXML shareable images to be installed as shared images. Its default value is " " (none).

- The third parameter is a list of the names of CXML shareable images to be installed as resident images. Its default value is " " (none).

If the default parameter values described above are acceptable, you can skip the rest of this step.

If you want to change any of these parameters, use the following instructions.

3.8.1 Setting CXML System-Wide Parameters

First parameter—controls the default CXML link library. If it has the value "IEEE", the library of routines using IEEE floating-point format will be designated as the default CXML link library. If its value is "VAX", the library of VAX floating-point format routines will be designated as the default CXML link library. The default value of this first parameter is "IEEE". If it does not have the value "VAX" or "IEEE", an error message will be given.

Second parameter—a list of the names of CXML shareable images to be installed as shared images. Its default value is "". Allowable names in this list are described in the following table.

Third parameter—a list of the names of CXML shareable images to be installed as resident images. Its default value is "". Allowable names in this list are described Table 3–1.

Table 3–1 Allowable names for the Second and Third CXML Startup Line Parameters

IEEE_BLAS1	VAX_BLAS1
IEEE_BLAS1E	VAX_BLAS1E
IEEE_BLAS2	VAX_BLAS2
IEEE_BLAS3	VAX_BLAS3
IEEE_COMMON	VAX_COMMON
IEEE_LAPACK	VAX_LAPACK
IEEE_SIG_PROC	VAX_SIG_PROC
IEEE_SPARSE	VAX_SPARSE
IEEE_VLIB	VAX_VLIB

The list entries are not case sensitive. If more than one name appears in a list, the names are separated by commas. The list may contain only the above names and comma(s). If a CXML shareable image name appears in both lists, it will be installed as a shared image.

For example, the following command will set the default CXML link library to be the one using IEEE floating-point format and will install the IEEE-format COMMON shareable image along with all the IEEE-format BLAS shareable images as resident images. No other CXML shareable images will be installed.

```
$ @SYS$STARTUP:CXML$STARTUP IEEE "" -
$_ IEEE_BLAS1,IEEE_BLAS1E,IEEE_BLAS2,IEEE_BLAS3,IEEE_COMMON
```

To install CXML images, your system must have sufficient resources available. Refer to the following tables to obtain the total number of global resources required.

If you are installing images as a /SHARED resource, add all relevant entries under the columns "GBLPAGES" and "GBLSECTIONS". Then check that your system is configured with a sufficient number of free global pages and free global sections to accomodate the images to be installed.

If you are installing images as /RESIDENT resources, add all relevant entries under the column "GH_RSRVPGCNT". Check that your system has sufficient free pages in the resident image code area of the granularity hint region (see Table 3–2 and Table 3–3).

Table 3–2 Global System Resoures For Installed Images—IEEE Format

Image Name	GBLPAGES	GBLSECTIONS	GH_RSRVPGCNT
CXML$STS_BLAS1	160	1	8
CXML$STS_BLAS1E	192	1	10
CXML$STS_BLAS2	2224	1	127
CXML$STS_BLAS3	3488	2	213
CXML$STS_COMMON	96	2	1
CXML$STS_LAPACK	7584	2	469
CXML$STS_SIG_PROC	7904	2	489
CXML$STS_SPARSE	1856	1	114
CXML$STS_VLIB	112	2	2

Table 3–3 Global System Resoures For Installed Images—VAX Format

Image Name	GBLPAGES	GBLSECTIONS	GH_RSRVPGCNT
CXML$FGS_BLAS1	160	1	8
CXML$FGS_BLAS1E	192	1	10
CXML$FGS_BLAS2	2224	1	127
CXML$FGS_BLAS3	3488	2	213
CXML$FGS_COMMON	96	2	1
CXML$FGS_LAPACK	7568	2	468
CXML$FGS_SIG_PROC	7904	2	489
CXML$FGS_SPARSE	1856	1	114
CXML$FGS_VLIB	112	2	2

3.8.2 Select a User-Specific Default CXML Link Library

Individual users can change the CXML link library by changed by invoking
SYS$LIBRARY:CXML$SET_LIB from their process.

The system-wide default CXML link library is set using the system startup file
SYS$STARTUP:CXML$STARTUP, as described in Section 3.8.1. In addition,
individual users may change their own specific default library by invoking
SYS$LIBRARY:CXML$SET_LIB themselves. For example, the following
command alters the default CXML link library for the current user to the VAX
format library:

```
$ @SYS$LIBRARY:CXML$SET_LIB VAX
```

For information on using CXML, refer to the *Compaq Extended Math Library
Reference Guide*. Refer also to the Web site http://www.compaq.com/math/.

3.9 Troubleshooting Tips

If your installation is not successful, check for the following possible problems:

- The appropriate PAK must be available to the user performing the installation. The PAK must be registered and loaded *before* you can install Compaq Fortran. For information about registering a PAK, see Section 1.3. Then reinstall Compaq Fortran.

- The DCLTABLES.EXE file should be in the SYS$COMMON:[SYSLIB] directory. There should *not* be a copy of DCLTABLES.EXE in SYS$SPECIFIC:[SYSLIB].

  If a copy of DCLTABLES.EXE is found in a SYS$SPECIFIC root, rename it to DCLTABLES.OLD, do an INSTALL REPLACE SYS$LIBRARY:DCLTABLES, then reinstall Compaq Fortran.

- The system logical name SYS$SYSROOT should not be modified from the preset definition provided by the OpenVMS Alpha operating system.

3.10 Getting Help and Reporting Problems

If you encounter a problem while using Compaq Fortran, report it to Compaq.

If an error occurs while Compaq Fortran is in use and you believe the error is caused by a problem with Compaq Fortran, take one of the following actions:

- If you have a Software Product Services Support Agreement, consider contacting your Customer Support Center (CSC) by telephone (in the United States, 1-800-354-9000) or by using the electronic means provided with your support agreement. You can use DSNlink or other electronic means to report the problem to the CSC.

- Customers without a service contract can arrange for per-call CSC support.

When you initially contact the CSC, please indicate the following:

- The name and version number of the operating system (OpenVMS Alpha) you are using

- The name (Compaq Fortran) and version number of Compaq Fortran you are using

- The hardware system you are using (such as a model number)

- How critical the problem is

- A very brief description of the problem (one sentence if possible)

When you submit information electronically or are speaking on the phone to the appropriate support specialist, you can provide more detailed information. This includes the specific commands used to compile and link the program, the error messages displayed, and relevant detailed information (possibly including source program listings). Please try to narrow the cause of the problem to a specific source module or lines of code.

CSC personnel may ask for additional information, such as listings of any command files, INCLUDE files, relevant data files, and so forth. If the program is longer than 50 lines, submit a copy of it electronically or provide machine-readable media (floppy diskette or magnetic tape).

Experience shows that problem reports sometimes do not contain enough information to duplicate or identify the problem. Concise, complete information helps Compaq give accurate and timely service to software problems.

To obtain information about purchasing Compaq support services, please contact your local sales representative.

You may also send comments and questions about the Compaq Fortran product to the following Internet mail address: fortran@compaq.com.

A
Files Added or Updated During Installation

This appendix lists, for each of the installable kits, the files that are added to or updated on your OpenVMS system during installation. Note that some files may not be installed depending on selected options or your system's configuration or operating system version. In the file names shown, a lowercase "n" indicates a version-dependent digit.

FORTRAN (Fortran Compiler)

```
[SYSEXE]F90$MAIN.EXE
[SYSEXE]FORT$MAIN.EXE
[SYSEXE]FORT$FSPLIT.EXE
[SYSHLP]HELPLIB.HLB (updated)
[SYSHLP]FORTRAN.RELEASE_NOTES
[SYSHLP]FORTRAN_RELEASE_NOTES.PS
[SYSLIB]DCLTABLES.EXE (updated)
[SYSLIB]FORT$FORTRAN-F95.CLD
[SYSLIB]FORT$FORTRAN-F77.CLD
[SYSLIB]FORSYSDEF,TLB
[SYSMSG]F90$MSG.EXE
[SYSMSG]FORT$MSG.EXE
[SYSMSG]FORT$MSG2.EXE
[SYS$STARTUP]FORT$STARTUP.COM
[SYSTEST]FORT$IVP.COM
```

FORRTL (Fortran Run-Time Library)

```
[SYSHLP]FORTRAN.RELEASE_NOTES
[SYSLIB]FORDEF.FOR
[SYSLIB]FORIOSDEF.FOR
[SYSLIB]DEC$FORRTL.EXE
[SYSLIB]STARLET.OLB (updated)
[SYSLIB]IMAGELIB.OLB (updated)
[SYSUPD]FOR$INSTALL_FORRTL.COM
[SYSTEST]FOR$RTL_IVP.COM
[SYSTEST]FOR$RTL_IVP.OBJ
```

CXML (Extended Math Library)

```
[SYSHLP]HELPLIB.HLB (updated)
[SYSHLP]CXML_LAPACK_C.TXT
[SYSHLP]CXML_LAPACK_D.TXT
[SYSHLP]CXML_LAPACK_S.TXT
[SYSHLP]CXML_LAPACK_Z.TXT
[SYSHLP]CXML-Vnnnn-RELEASE-NOTES.TXT
[SYSHLP]CXML-Vnnnn-RELEASE-NOTES.PS
[SYSHLP.EXAMPLES.CXML]READ_ME.INDEX
[SYSHLP.EXAMPLES.CXML]EXAMPLE_LAPACK_1.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_LAPACK_2.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLES_SIG_PROC.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_ITSOL_1.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_ITSOL_2.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_ITSOL_3.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_ITSOL_4.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_ITSOL_5.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_SKYSOL_1.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_SKYSOL_2.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_SKYSOL_3.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_SKYSOL_4.FOR
[SYSHLP.EXAMPLES.CXML]EXAMPLE_ITSOL_1.C
[SYSHLP.EXAMPLES.CXML]EXAMPLE_LAPACK_1.C
[SYSHLP.EXAMPLES.CXML]EXAMPLE_SFFT_1D.C
[SYSHLP.EXAMPLES.CXML]EXAMPLE_SFFT_2D.C
[SYSHLP.EXAMPLES.CXML]EXAMPLE_SKYSOL_1.C
[SYSHLP.EXAMPLES.CXML]EXAMPLE_ITSOL_1.CXX
[SYSHLP.EXAMPLES.CXML]EXAMPLE_SKYSOL_1.CXX
[SYSLIB]CXMLDEF.FOR
[SYSLIB]CXML_DEF.FOR
[SYSLIB]DXMLDEF.FOR
[SYSLIB]DXML_DEF.FOR
[SYSLIB]CXMLDEF.H
[SYSLIB]CXML_DEF.H
[SYSLIB]DXMLDEF.H
[SYSLIB]DXML_DEF.H
[SYSLIB]CXML_EQUIVALENCE_LAPACK.C
[SYSLIB]CXML$EMACS.ML
[SYSLIB]CXML$EVE.TPU
[SYSLIB]CXML$FGS.OLB
[SYSLIB]CXML$FGS_BLAS1.EXE
[SYSLIB]CXML$FGS_BLAS1E.EXE
[SYSLIB]CXML$FGS_BLAS2.EXE
[SYSLIB]CXML$FGS_BLAS3.EXE
[SYSLIB]CXML$FGS_COMMON.EXE
[SYSLIB]CXML$FGS_LAPACK.EXE
[SYSLIB]CXML$FGS_SCIPORT.OLB
[SYSLIB]CXML$FGS_SIG_PROC.EXE
[SYSLIB]CXML$FGS_SPARSE.EXE
[SYSLIB]CXML$FGS_VLIB.EXE
[SYSLIB]CXML$IMAGELIB_GS.OLB
```

```
[SYSLIB]CXML$IMAGELIB_TS.OLB
[SYSLIB]CXML$SET_LIB.COM
[SYSLIB]CXML$STS.OLB
[SYSLIB]CXML$STS_BLAS1.EXE
[SYSLIB]CXML$STS_BLAS1E.EXE
[SYSLIB]CXML$STS_BLAS2.EXE
[SYSLIB]CXML$STS_BLAS3.EXE
[SYSLIB]CXML$STS_COMMON.EXE
[SYSLIB]CXML$STS_LAPACK.EXE
[SYSLIB]CXML$STS_SCIPORT.OLB
[SYSLIB]CXML$STS_SIG_PROC.EXE
[SYSLIB]CXML$STS_SPARSE.EXE
[SYSLIB]CXML$STS_VLIB.EXE
[SYS$STARTUP]CXML$STARTUP.COM
[SYSTEST]CXML_IVP.COM
[SYSTEST.CXML]BLAS_BUILD_TEST.OBJ
[SYSTEST.CXML]LAPACK_BUILD_TEST.OBJ
[SYSTEST.CXML]SIG_PROC_BUILD_TEST.OBJ
[SYSTEST.CXML]SPARSE_BUILD_TEST.OBJ
[SYSTEST.CXML]VLIB_BUILD_TEST.OBJ
[SYSTEST.CXML]IVP_LAPACK_VAX.OBJ
[SYSTEST.CXML]IVP_LAPACK_IEEE.OBJ
[SYSTEST.CXML]IVP_SIG_VAX.OBJ
[SYSTEST.CXML]IVP_SIG_IEEE.OBJ
[SYSTEST.CXML]IVP_SPARSE_B1_VAX.OBJ
[SYSTEST.CXML]IVP_SPARSE_B1_IEEE.OBJ
[SYSTEST.CXML]IVP_SPARSE_IS_VAX.OBJ
[SYSTEST.CXML]IVP_SPARSE_IS_IEEE.OBJ
[SYSTEST.CXML]IVP_SPARSE_SKY_VAX.OBJ
[SYSTEST.CXML]IVP_SPARSE_SKY_IEEE.OBJ
[SYSTEST.CXML]IVP_VLIB_VAX.OBJ
[SYSTEST.CXML]IVP_VLIB_IEEE.OBJ
[SYSUPD]CXML$REMOVE_FILES.COM
```

ADB (Advanced Debugger)

```
[DECW$DEFAULTS.SYSTEM]VMSDEBUG_Vnn.DAT
[SYSEXE]LINKER64.EXE
[SYSEXE]DBGHK$PRCDUMP_KERNEL_Vnn.COM
[SYSEXE]DBGHK$PRCDUMP_KERNEL_Vnn.EXE
[SYSEXE]DBGHK$PRCDUMP_KERNEL_Vnn.MAP
[SYSEXE]DBGHK$SYSDUMP_KERNEL_Vnn.COM
[SYSEXE]DBGHK$SYSDUMP_KERNEL_Vnn.EXE
[SYSEXE]DBGHK$SYSDUMP_KERNEL_Vnn.MAP
[SYSEXE]DBGHK$HOST_KERNEL_Vnn.COM
[SYSEXE]DBGHK$HOST_KERNEL_Vnn.EXE
[SYSEXE]DBGHK$HOST_KERNEL_Vnn.MAP
[SYSEXE]FORCE_PROCESS_DUMP.EXE
[SYSHLP]ADBxxx.RELEASE_NOTES
[SYSHLP]DBG$HELP_Vnn.HLB
[SYSHLP]DBG$UIHELP_Vnn.HLB
[SYSLIB]DCLTABLES.EXE (updated)
[SYSLIB]CS_IN_DEBUG.CLD
[SYSLIB]CS_OUT_DEBUG.CLD
[SYSLIB]Vnn_Vnn_ANALYZE.CLD
[SYSLIB]Vnn_ANALYZE.CLD
[SYSLIB]DEBUG_Vnn.EXE
[SYSLIB]DEBUG_Vnn.MAP
[SYSLIB]DEBUGSHR_Vnn.EXE
[SYSLIB]DEBUGSHR_Vnn.MAP
[SYSLIB]TRACE_Vnn.EXE
[SYSLIB]TRACE_Vnn.MAP
[SYSLIB]DEBUGSRVSHR_Vnn.EXE
[SYSLIB]DEBUGSRVSHR_Vnn.MAP
[SYSLIB]DEBUGUISHR_Vnn.EXE
[SYSLIB]DEBUGUISHR_Vnn.MAP
[SYSLIB]VMSDEBUGUIL_Vnn.UID
[SYSLIB]DBG$HA_Vnn.UID
[SYSLIB]DBG$HA_KERNEL_Vnn.EXE
[SYSLIB]DBG$HA_KERNEL_Vnn.MAP
[SYSLIB]DBG$HA_MAIN_Vnn.EXE
[SYSLIB]DBG$HA_MAIN_Vnn.MAP
[SYSLIB]LIBRTL_INSTRUMENTED.EXE
[SYSLIB]IMGDUMP_Vnn.EXE
[SYSLIB]IMGDUMP_RIGHTS_Vnn.EXE
[SYSLIB]SDA$SHARE_Vnn.EXE
[SYSMSG]DBGTBKMSG_Vnn.EXE
[SYSMSG]PRGDEVMSG_Vnn.EXE
[SYSTEST]DBG$IVP.COM
[SYSTEST]DBG$DW$IVP.COM
[SYSTEST]IVP_IMAGE.PAS
[SYSTEST]IVP_IMAGE.EXE
[SYSTEST]IVP_SCRIPT.TXT
[SYSTEST]IVP_SCRIPT.OUT_OLD
[SYSUPD]DBGKITUNINSTAL.COM
[SYS$STARTUP]DEBUG$SETUP.COM
[SYS$STARTUP]DEBUG$STARTUP_Vnn.COM
```

B

Installation Messages

This appendix lists the more common diagnostic messages you might see
during product installation. If you encounter a message not shown here, use
the HELP/MESSAGE command to display information about it. If you add
the /LOG qualifier to the PRODUCT INSTALL command, many additional
informational messages will be displayed - these can be ignored.

FAILCONF, failed to resolve conflicting requirements for 'object-
           type' 'object-name'

 Explanation: More than one product supplies a managed object of the same
               name, type, and scope. They cannot coexist because of a
               conflict in the objects' properties. Files, directories, and
               library modules are examples of managed objects.

 User Action: If you are installing the FORRTL kit on OpenVMS 7.1, ignore this
               message and continue the installation. Otherwise, report the
               problem to Compaq.

INSTALLERR, error executing DCL INSTALL command

 Explanation: The POLYCENTER Software Installation utility installs a file
               as a known image by having the DCL command INSTALL execute in
               a subprocess. The INSTALL command failed.

 User Action: Take action based on the accompanying messages. If you specify
               the /TRACE qualifier when you retry the operation, you can
               view the command sent to the subprocess.

IVPFAILURE, test procedure completed with an error status

 Explanation: The installation verification test procedure for the product
               completed with an exit status that indicates a failure. If you
               were executing a PRODUCT INSTALL command, the product has been
               completely installed, but its test procedure failed.

User Action: Take action based on the accompanying messages. If you specify
              the /TRACE qualifier when you retry the operation, you can
              view the commands sent to the subprocess and the output
              generated when these commands are executed.

RETAIN, 'object' 'object-name' was not replaced because 'object'
         from kit does not have higher generation number

Explanation: During installation of a software product (or a patch to
              a software product), the specified object (either a file
              or a library module) was not copied from the kit to the
              destination disk. The installation utility found an object
              with the same name already installed on the destination disk
              and that object's generation (sequencing) number was the same
              or greater than the generation number of the object from the
              kit. Therefore, the object with the latest generation number
              (the previously installed item) was left on your destination
              disk.

              This condition typically occurs when you install multiple
              patches or updates to the same product. The installation
              utility performs conflict detection and resolution so that
              your system will always retain the most current files even if
              updates are not installed in chronological order.

User Action: None.