Compaq DCE for OpenVMS VAX and OpenVMS Alpha

Installation and Configuration Guide

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This guide describes the installation procedure and the system configuration utility for the Compaq Distributed Computing Environment (DCE) for OpenVMS VAX and OpenVMS Alpha.

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Operating System:	OpenVMS VAX Version 6.2 or higher OpenVMS Alpha Version 6.2 or higher
Software Version:	Compaq DCE for OpenVMS Version 3.0

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Preface

This guide describes the installation procedure and the system configuration utility for the Compaq Distributed Computing Environment (DCE) for OpenVMS VAX and OpenVMS Alpha Version 3.0, which consists of the following services:

- Remote Procedure Call (RPC) service provides connectivity between individual procedures in an application across heterogeneous systems in a transparent way.
- Interface Definition Language (IDL) compiler is required for developing distributed DCE applications.
- Threads service provides user-mode control and synchronization of multiple operations. Threads is packaged with the base operating system.
- Cell Directory Service (CDS) provides a location-independent method of identifying resources within a cell. A cell is the smallest group of DCE systems that share a common naming and security domain.
- DCE Security Service provides authentication and authorization within a cell and is based on MIT's Kerberos private key encryption system.
- Distributed Time Service (DTS) provides date and time synchronization within a cell.

Four kits are installed:

Runtime Services Kit
Application Developer's Kit
CDS Server Kit
Security Server Kit

The Runtime Services Kit contains the following:

- Authenticated CDS Advertiser and Client Support
- CDS Browser
- CDS Control Program (cdscp)
- Authenticated DCE RPC runtime support (supports DECnet, TCP/IP, and UDP)
- Authenticated RPC runtime support (supports DECnet, TCP/IP, and UDP via NTLM security protocol on OpenVMS Alpha Version 7.2-1 and higher.)
- RTI (Remote Task Invocation) RPC for Compaq's ACMSxp TP product
- Security Client Support
- Integrated Login
- A DCE_LOGIN tool for obtaining credentials
- A RGY_EDIT tool for registry maintenance functions

- KINIT, KLIST, and KDESTROY Kerberos tools
- An ACL_EDIT tool for access control lists (ACLs) for DCE objects
- RPC Control Program (rpccp)
- DCE Control Program (dcecp)
- Name Service Interface Daemon (nsid); also known as the PC Nameserver Proxy
- Native Kerberos
- XDS Directory Services
- XDS Object Management

The Application Developer's Kit contains the following:

- The contents of the Runtime Services Kit
- Required DCE application development header files
- Interface Definition Language (IDL) compiler
- Object-Oriented RPC
- Generic Security Service (GSSAPI)
- LSE Templates for IDL
- UUID Generator
- The .H (Include) files and .IDL files for application development
- Sample DCE applications

The CDS Server Kit contains the following:

- CDS server (cdsd)
- Global Directory Agent (GDA)
- PC Name Service Interface Daemon (nsid)

The Security Server Kit contains the following:

- Security server (secd)
- Tool used to create the security database (sec_create_db)
- Security server administrative tool (sec_admin)

Keep this document with your distribution kit. You will need it to install maintenance updates or to reinstall Compaq DCE.

Intended Audience

This guide is intended for managers of distributed computing environments on one or more systems and installers of the Compaq DCE for OpenVMS VAX or OpenVMS Alpha Kit Version 3.0.

Document Structure

This guide is organized as follows:

- Chapter 1 describes the requirements and procedures that you must complete before installing the software.
- Chapter 2 describes the installation process.
- Chapter 3 describes procedures that you must complete after the installation.
- Chapter 4 describes the steps necessary to set up a DCE cell, and the DCE system configuration utility for Compaq DCE for OpenVMS VAX and OpenVMS Alpha.
- Chapter 5 explains how to create a cell and configure the Security server and CDS server on the same system. It also discusses how to configure a client system into an existing DCE cell.
- Chapter 6 describes the steps you need to complete to modify a cell configuration.
- Appendix A lists the directories and files created by the installation procedure and system configuration utility.
- Appendix B contains sample logs of the installation procedure.
- Appendix C contains sample logs of the configuration procedure.

Related Documents

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Conventions

VMScluster systems are now referred to as OpenVMS Cluster systems. Unless otherwise specified, references in this document to OpenVMS Clusters or clusters are synonymous with VMSclusters.

The following conventions are also used in this guide:

Ctrl/*x*	A sequence such as Ctrl/*x* indicates that you must hold down the key labeled Ctrl while you press another key or a pointing device button.
italic text	Italic text indicates important information, complete titles of manuals, or variables. Variables include information that varies in system output (Internal error *number*), in command lines (/PRODUCER=*name*), and in command parameters in text (where *device-name* contains up to five alphanumeric characters).
UPPERCASE TEXT	Uppercase text indicates a command, the name of a routine, the name of a file, or the abbreviation for a system privilege.
`Monospace text`	Monospace text indicates code examples and interactive screen displays. In the C programming language, monospace text identifies the following elements: keywords, the names of independently compiled external functions and files, syntax summaries, and references to variables or identifiers introduced in an example.
Case-sensitivity	OpenVMS operating system commands do not differentiate between uppercase and lowercase. However, many DCE commands do make this distinction. In particular, the system configuration utility interprets names in a case-sensitive manner.

1
Preparing for Installation

This chapter describes the preparations you must make before you install and configure the *Compaq Distributed Computing Environment (DCE) for OpenVMS VAX and OpenVMS Alpha* software.

Compaq DCE is an enabling software technology for the development of distributed applications. It provides a variety of common services needed for the development of distributed applications, such as name services and a standard remote procedure call interface.

1.1 Planning for Installation and Configuration

This section helps you plan for the installation and configuration of the Compaq DCE. It presents a brief overview of some concepts that you need to understand before you install and configure Compaq DCE software. This understanding can help you decide how to configure DCE. Refer to *Understanding DCE* for detailed explanations of DCE concepts.

The installation and configuration procedures set up the DCE environment so that you can use DCE services. Before you can use Compaq DCE software, you must both install the software and configure DCE on your system.

1.1.1 What Is a Cell?

A cell is the basic DCE unit consisting of a group of nodes that share a directory service namespace and a security service registry under a common administration. Usually, the nodes in a cell are in the same geographic area, but cell boundaries are not limited by geography. Although a cell can contain from one to several thousand nodes, each node can belong only to one cell at a time.

The system configuration utility allows you to join an existing cell. The cell must provide a directory server and a security server. These servers may be resident on the same system or may be running on separate systems.

Note that if you rely on DCE time services for time synchronization, by default, you need a minimum of three time servers to synchronize time in a cell. See the section on the DCE Distributed Time Service in the *OSF DCE Administration Guide* for more information.

1.1.2 Creating a Cell

See Chapter 4 for cell configuration guidelines.

1.1.3 Joining a Cell

You need the following information to join a DCE cell:

- Full cell name
- Host name of the DCE Security Server
- Security principal name and password authorized to perform cell administration operations
- Location of the cell's CDS server (on or not on the same LAN as you are)

When the client joining the cell is on the same LAN as the CDS directory master server, the CDS advertiser automatically determines the server's location by using IP (Internet Protocol) broadcast packets. If the CDS master server is not on the LAN, then you need to provide the host name where the CDS master server is running.

1.2 Inspecting the Distribution Kit

The Software Bill of Materials (BOM) included with your distribution kit specifies the contents of your distribution kit. Carefully compare the items you received with the items listed in the BOM. If any components are missing or damaged, contact your Compaq customer service representative before you continue with the installation.

The Read Before Installing letter listed on your BOM provides important information that you should be aware of before you install Compaq DCE. Some of this information may not be included in either this guide or the release notes.

Compaq DCE provides online release notes. Read the release notes before you install the product. They contain information about changes to the product. For example, the release notes contain important information on modifications you should make to TCP/IP parameters before you begin the installation.

1.3 Troubleshooting

The *Compaq DCE for OpenVMS VAX and OpenVMS Alpha Product Guide* includes a chapter on troubleshooting. Read this chapter if you are having installation or configuration problems. For example, the Troubleshooting chapter discusses problems you may encounter with time and time zones.

1.4 Installation Procedure Requirements

The following sections discuss the requirements for installing Compaq DCE.

The length of time the installation takes to complete depends on the type of machine, the load on that machine, and the kit you choose to install.

1.4.1 Required Hardware

To perform the installation, you need the following hardware:

- A processor running OpenVMS VAX or Alpha Version 6.2 or higher.
- A software distribution device, if you are installing the software from media. You need a distribution device that corresponds with the software distribution media.

Note

Systems running OpenVMS Alpha should have access to a CD-ROM reader so you can install the software. Please check to see that you have a CD-ROM reader installed.

1.4.2 Required Software

This section describes the software that must be installed on an OpenVMS system before you can properly perform the installation, configure the system, or use the software. In cases where the minimum version is not specified, refer to the Software Product Description (SPD) for more information.

1.4.2.1 On OpenVMS Alpha and VAX Systems

Before installing Compaq DCE, you need the following software on your system:

- OpenVMS Version 6.2 or higher
- DECnet Phase IV or DECnet/OSI

  DECnet is required only if you run applications that use DECnet as their transport.
- Compaq TCP/IP Services Version 4.2 or higher

  You must have Compaq TCP/IP Services installed and configured on each host from which you plan to execute DCE applications. See *Compaq TCP/IP Services for OpenVMS Installation and Configuration* for more information about the UDP/IP and TCP/IP transports.

  If you plan to use MultiNet or TCPware from Process Software or Pathway from Wollongong (instead of Compaq's TCP/IP Services for OpenVMS), please see the release notes for more information.
- If you are installing the Application Developer's Kit and plan on using the LSE templates, LSE and an appropriate license must be installed before you install DCE.

1.4.3 Time Required for Installation

Depending on your configuration, the installation can take from 10 to 30 minutes.

1.4.4 Disk Space, Global Pages, and Global Sections Required

The disk space, global pages, and global sections requirements of Compaq DCE are different for the DCE Runtime Services Kit (RTK) and for the Application Developer's Kit (ADK). These requirements also differ on OpenVMS VAX and on OpenVMS Alpha systems. Table 1–1 lists the requirements before the installation for each kit on each platform. (Disk space requirements are listed in blocks.) Note that the DCE CDS Server and Security Server images are part of the DCE Kit and are enabled by license PAKs.

Table 1–1 Disk Space, Global Pages, and Global Sections Requirements

Kit	Disk Space	Global Pages	Global Sections
OpenVMS VAX RTK	120,000	3750	40
OpenVMS VAX RTK & ADK	150,000	3750	40
OpenVMS Alpha RTK	48,000	7350	35
OpenVMS Alpha RTK & ADK	58,000	7350	35

To determine how much free disk space is on your system disk, enter the following command:

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

The system responds with a short table; the column labeled Free Blocks shows the amount of storage space remaining on your system disk. If there is not enough disk space to install or to run Compaq DCE, work with your system manager to delete and purge files that are no longer needed.

To determine the number of free global pages and global sections on your system, enter the following commands:

```
$ WRITE SYS$OUTPUT F$GETSYI("FREE_GBLPAGES")

$ WRITE SYS$OUTPUT F$GETSYI("FREE_GBLSECTS")
```

If the values displayed by the system are greater than the minimum required, your system has adequate free global pages and global sections. If the values are less than the minimum required, use the AUTOGEN command procedure to increase the values, as follows:

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

For details on using AUTOGEN, see the *OpenVMS System Manager's Manual*.

1.4.5 Privileges and Quotas Required

To install Compaq DCE for OpenVMS VAX and OpenVMS Alpha, log in to the system manager account. If you are not logged in to the system manager's account during installation, you must have at least the SETPRV privilege. To determine the privileges you have, enter the following command:

```
$ SHOW PROCESS/PRIVILEGES
```

If you do not have sufficient privileges to install Compaq DCE, see your system manager.

The DCE system management utility requires WORLD privileges for the SHOW command and WORLD, SYSPRV, and CMKRNL privileges for all other commands.

You should also check to make sure you have adequate quotas for the installation. You need the following quota values:

- ASTLM = 24
- BIOLM = 18
- BYTLM = 18000
- DIOLM = 18

- ENQLM = 30
- FILLM = 20

Use the OpenVMS Authorize Utility if you want to verify and change process quotas for the installation account in the user authorization file (UAF). For example, to change the BYTLM quota for your installation account, enter the following command sequence:

```
$ RUN SYS$SYSTEM:AUTHORIZE
UAF> MODIFY account-name /BYTLM = 18000
UAF> SHOW account-name
UAF> EXIT
$ LOGOUT
```

After you change the quotas for your installation account, log out of the installation account and log in again for the new quotas to take effect. You can then proceed with the installation.

User account quotas are stored in the file SYSUAF.DAT. For more information on modifying account quotas, see the description of the Authorize Utility in the OpenVMS system management documentation.

1.4.6 Completing License Management Facility Requirements

If you are installing only the Runtime Services Kit of Compaq DCE, you do not need a separate license. The right to use the Compaq DCE Runtime Services Kit is granted with the OpenVMS operating system.

The installation procedure for DCE installs the following kits by default without checking for licences: DCE Runtime Services, CDS Server Kit, and the Security Server Kit. To install the Application Developer's Kit, you must override the installation defaults by answering NO to the following question:

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

If you are installing the Application Developer's Kit and plan on using LSE templates, LSE and an appropriate license must be installed before you install DCE.

To register a license under OpenVMS, first log in to the system manager's account, SYSTEM. Then use either 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.

The license for the Application Developer's Kit is DCE-APP-DEV. The license for the Security Server Kit is DCE-SECURITY. The license for the CDS Server Kit is DCE-CDS.

Although it is necessary to have only one license active for this product, the License Management Facility (LMF) checks for the existence of any valid license. If LMF displays license failures for some of these other licenses, disregard the messages.

If you plan to use Compaq DCE on more than one node in a VMScluster environment, you must register and load a license for each of the other nodes before you configure them.

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

1.4.7 Performing System Backup

Back up your system disk before installing any software. Use the backup procedures established at your site. For details on backing up a system disk, see the *OpenVMS Backup Utility Manual*.

1.4.8 Installing DCE Version 3.0 Over Previous Versions

Note

If you are installing Compaq DCE for OpenVMS VAX or OpenVMS Alpha Version 3.0 over a previous version of DCE, you do not have to reconfigure DCE after the installation. Before the installation, stop the DCE daemons with the following command:

```
$ @SYS$MANAGER:DCE$SETUP CLEAN
```

Then, after the installation, enter the following command:

```
$ @SYS$MANAGER:DCE$SETUP START
```

You must reconfigure if you are installing DCE for the first time or if you are installing a new version over DCE Version 1.0.

If you are installing DCE over an existing Compaq DCE for OpenVMS VAX or OpenVMS Alpha, perform the following steps:

1. Stop the DCE daemons with the following commands:

   ```
   $ @SYS$MANAGER:DCE$SETUP CLEAN
   ```

   If you are installing DCE over an existing Compaq DCE for OpenVMS VAX or OpenVMS Alpha prior to Version 1.5, you do not need to complete the RPC shutdown step. The RPC shutdown is done automatically as part of the CLEAN operation in DCE$SETUP.COM. DCE$RPC_SHUTDOWN should be executed for DCE Version 1.5 only. As in prior versions, DCE$SETUP.COM in DCE Version 3.0 automatically shuts down RPC as part of a CLEAN, STOP, or CONFIG operation.

   ```
   $ @SYS$MANAGER:DCE$RPC_SHUTDOWN
   ```

2. After the installation, enter the following command:

   ```
   $ @SYS$MANAGER:DCE$SETUP START
   ```

2
Installing DCE

This chapter describes the installation procedure for Compaq DCE for OpenVMS VAX and OpenVMS Alpha.

You can use different media to install Compaq DCE. The examples in this chapter show the installation procedure using disk files.

See Appendix B for logs of sample installations.

2.1 About the OpenVMS Installation Procedure

This section gives a brief overview of the OpenVMS installation procedure for Compaq DCE Version 3.0 called DCE$INSTALL.COM. The OpenVMS installation command has the following format:

```
$ @DKA300:[000000]DCE$INSTALL [HELP]
```

where:

- *DKA300:* is a device name on which the distribution volumes will be mounted. Remember that all Alpha systems come with CD-ROM readers.
- DCE$INSTALL is the supplied command procedure that drives the installation.

It is not necessary to use the console drive to install DCE. If you do use the console drive, replace any media you remove from the drive.

Include the optional parameter HELP if you want PCSI to display help information.

When you invoke DCE$INSTALL, it checks the following conditions:

- Whether you are logged in to a privileged account. Install software from the system manager's account with your default device and directory set to SYS$UPDATE.
- Whether you have adequate quotas for installation. See Section 1.4.5 for more information on quota values.

You can stop the installation at any time by pressing Ctrl/C or Ctrl/Y. However, files created up to that point are not deleted. You must delete these files manually, using the OpenVMS DELETE command. Appendix A lists the files and directories created during the installation procedure.

2.2 Starting the Compaq DCE Installation Procedure

See Section 1.4.2 for more information about software requirements.

Start the installation procedure as follows:

1. Log in to the account from which you are installing the Compaq DCE.
2. If you are installing a kit other than the Runtime Services Kit, make sure you have registered the appropriate LMF PAK.
3. Invoke the following command procedure, substituting the correct name of your media device and directory for DKA300 (used in the example):

```
$ @DKA300:[000000]DCE$INSTALL HELP
```

2.3 Continuing the Installation

This section describes the part of the installation procedure that is specific to DCE.

```
$ @DKA300:[000000]dce$install help

        Performing DCE pre-installation tasks...please wait.
```

Creating a DCE$SERVER Account

If you do not already have a DCE$SERVER account, the installation procedure creates one for you with TMPMBX, NETMBX, DETACH, and SYSPRV privileges.

```
    This installation procedure has detected an existing DCE$SERVER
    account. Correct operation of DCE on this system requires that the
    DCE$SERVER account have TMPMBX, NETMBX, DETACH and SYSPRV privileges.

    The installation procedure will modify the DCE$SERVER account to ensure
    that the prerequisite privileges are present.

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

The following product has been selected:
    DEC AXPVMS DCE V3.0                    Layered Product [Installed]

Do you want to continue? [YES]

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 DCE V3.0: DCE V3.0 for OpenVMS Alpha
```

Description of Kits

The installation procedure displays information about the four Compaq DCE kits (Runtime Services Kit, Application Developers' Kit, Security Server Kit, and CDS Server Kit). Depending on the kit, the procedure displays specific information about the kit that will be installed.

```
    Greetings!

    This is DCE V3.0 for OpenVMS Alpha.
    There are four components: the DCE Runtime Services, the
    DCE Application Development Kit, the DCE Security Server,
    and the DCE CDS Server.

     1. The Runtime Services provides the core services necessary to
        execute and manage DCE applications.
```

```
     2. The Application Development Kit provides the services and tools
        required to develop, execute, and manage DCE applications.
        The Runtime Services capability is automatically provided
        with the Application Development Kit.

     3. The security server supplies support for a cell wide security
        database. A cell must have at least one system running a security
        server.

     4. The CDS server supplies support for a cell wide naming database.
        A cell must have at least one system running a CDS server.

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    This product uses the following PAKS: DCE-SECURITY, DCE-CDS, DCE-APP-DEV

    This product currently has 3 Product Authorization Keys:

        Producer      PAK Name        Version      Release Date

        DEC           DCE-SECURITY    V3.0         01-JUL-2000
        DEC           DCE-CDS         V3.0         01-JUL-2000
        DEC           DCE-APP-DEV     V3.0         01-JUL-2000

Do you want the defaults for all options? [YES] NO

    The Application Development Kit is optional and enabled with a PAK.
    It provides the services and tools required to develop, execute, and
    manage DCE applications.

      The Application Development Kit installs:

      + Required DCE application development header files
      + Interface Definition Language Compiler (IDL)
      + Language-Sensitive Editor (LSE) Templates for the Interface
               Definition Language
      + Unique User Identifier (UUID) Generator
      + Sample DCE Applications

    The Application Development Kit [NO] YES

Do you want to review the options? [NO]

Execution phase starting ...

The following product will be installed to destination:
    DEC AXPVMS DCE V3.0                   DISK$SYSTEM:[VMS$COMMON.]

Portion done:
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%

The following product has been installed:
    DEC AXPVMS DCE V3.0                   Layered Product

*** DCE Product installation successful...beginning post-installation.
```

```
    The rights identifier NET$DECLAREOBJECT will now be granted to the
    DCE$SERVER account. You may IGNORE the message:

"%UAF-E-GRANTERR, unable to grant identifier NET$DECLAREOBJECT to
DCE$SERVER-SYSTEM-F-DUPIDENT, duplicate identifier"

    if it should occur.

Press return to Continue
%UAF-E-GRANTERR, unable to grant identifier NET$DECLAREOBJECT to
DCE$SERVER-SYSTEM-F-DUPIDENT, duplicate identifier
```

Installing Language Sensitive Editor (LSE) Templates for IDL

If you are installing DCE on a cluster on which the Language Sensitive Editor (LSE) is installed, the system or the user must have a license to run LSE in order for DCE to install the LSE templates for the Interface Definition Language (IDL) compiler. Type YES to the following question if you have a license to run LSE.

```
Load the Language-Sensitive Editor (LSE) templates for IDL? [Y]: NO

    NOTE: Please add the following to your system's SYS$MANAGER:SYLOGIN.COM.
          These files define foreign commands for using DCE on OpenVMS.

          $ @SYS$MANAGER:DCE$DEFINE_REQUIRED_COMMANDS.COM
          $ @SYS$COMMON:[DCE$LIBRARY]DCE$DEFINE_OPTIONAL_COMMANDS.COM
```

Selecting a TCP/IP Product

You are now asked to update SYS$STARTUP:SYSTARTUP_VMS.COM and choose a TCP/IP product.

```
      Please add the following command to SYS$STARTUP:SYSTARTUP_VMS.COM on your
      system. This ensures that DCE$STARTUP.COM is executed at system boot. The
      parameters supplied to DCE$STARTUP.COM depend on the specific TCP/IP
      product you intend to use. You will now be asked to select the name of
      this TCP/IP product, and the installation will supply you with the
      correct command for SYS$STARTUP:SYSTARTUP_VMS.COM.

        TCP/IP product                          Keyword

        Compaq's TCP/IP Services for OpenVMS    UCX
        Multinet from TGV                       MULTINET
        Pathway from Wollongong                 PATHWAY
        TCPware from Process Software           TCPWARE
        No TCP/IP Available at this time        NONE

Enter one of the keywords from the table above [UCX]:
```

See the release notes for more information on UCX, MultiNet, Pathway, and TCPware.

```
Enter $ @SYS$STARTUP:DCE$STARTUP in your SYS$STARTUP:SYSTARTUP_VMS.COM

%DCE-W-INSTALL, Please increase the sysgen parameter GBLPAGES to 118171

%DCE-S-INSTALL, Installation of OpenVMS DCE V3.0 completed
```

2.4 Installing on a VMScluster

On a VMScluster with a common system disk, you need only install Compaq DCE once. After the initial installation, ensure that a separate license is registered and loaded on each cluster member that you plan to use for DCE services.

If you are installing DCE for OpenVMS over an existing version of DCE on a common system disk in a VMScluster environment, be sure to shut down DCE on all nodes that share the common system disk before the installation.

Note

You must configure each node separately.

To configure each node separately, enter the following command on each node:

```
$ @SYS$MANAGER:DCE$SETUP.COM CONFIG
```

If you are installing Compaq DCE on a VMScluster that does not have a common system disk, you must install the software on each node and configure each node that you plan to use for DCE services.

3
Postinstallation Procedures

This chapter describes postinstallation steps that you need to take and lists ways to recover from errors that you encounter during the installation.

3.1 Postinstallation Tasks

After the installation is completed successfully, note the following.

1. DCE Version 3.0 provides support for the RPC runtime environment and RPC applications (which are not dependent on DCE services) to remain active when DCE is shut down. This requires the use of separate startup files: SYS$STARTUP:DCE$RPC_STARTUP.COM and SYS$STARTUP:DCE$STARTUP.COM.

   On OpenVMS VAX and Alpha Version 7.2 and higher, the RPC runtime environment files are shipped with the operating system. When installing DCE Version 3.0 on OpenVMS VAX and Alpha Version 6.2 through 7.1, DCE provides the RPC runtime environment files.

   On OpenVMS Version 7.2 and higher, the DCE installation may update the RPC files provided by the system if the DCE installation files are more recent.

   If you want all of the configured DCE services to start with the system startup, add the following line to SYS$MANAGER:SYSTARTUP_VMS.COM after the startup commands for the network transports, DECnet, and/or Compaq TCP/IP services:

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

   If you want only the RPC runtime environment to start with the system startup, add the following line to SYS$MANAGER:SYSTARTUP_VMS.COM:

   ```
   $ @SYS$STARTUP:DCE$RPC_STARTUP.COM
   ```

   It is not necessary to run both procedures. Invoking DCE$STARTUP.COM will first start the RPC Runtime, then the DCE services. See Chapter 4 for more information about configuring DCE.

2. Depending on your choice for system startup, add the following commands to SYS$MANAGER:SYSHUTDWN.COM before the shutdown commands for the network transports, DECnet, and/or DEC TCP/IP services:

   - If you have configured DCE services on your system:

     ```
     $ @SYS$STARTUP:DCE$SHUTDOWN.COM
     ```

   - If you have the RPC runtime environment only:

     ```
     $ @SYS$STARTUP:DCE$RPC_SHUTDOWN.COM NOCONFIRM
     ```

If DCE$SHUTDOWN.COM is added to the system shutdown file, it will prompt you for a password before shutting down DCE. This will delay the shutdown until the password is specified.

3. Configure this node by entering the following command:

```
$ @SYS$MANAGER:DCE$SETUP CONFIG
```

You must configure the DCE services before you can use them. See Chapter 5 for more information about configuring DCE.

4. If you are running DCE server applications that are listening over the DECnet Phase IV (ncacn_dnet_nsp) protocol or the DECnet/OSI (ncacn_dnet_nsp) protocol, you must grant the NET$DECLAREOBJECT rights identifier to those processes from which the server runs.

5. Define foreign commands. There are two foreign command definition files: one file contains required commands and the other file is optional. Add the following line to the file SYS$MANAGER:SYLOGIN.COM:

```
$ @SYS$MANAGER:DCE$DEFINE_REQUIRED_COMMANDS.COM
```

DCE$DEFINE_REQUIRED_COMMANDS.COM, the required command definition file, defines the following foreign commands:

- acl_edit, which invokes the ACL editor (Security)
- cdscp, which invokes the CDS control program
- chpass, which invokes the DCE change password utility
- dce$uaf, which invokes the DCE Integrated Login User Authorization File utility
- dtscp, which invokes the DTS control program
- dce$export, which invokes the DCE Integrated Login EXPORT utility
- dce$import, which invokes the DCE Integrated Login IMPORT utility
- dce_config, which invokes the DCE configuration utility
- dce_setup, which invokes the DCE configuration utility
- dceecp, which invokes the DCE control program
- dtscp, which invokes the DCE Time Control program
- dce_login, which validates a principal's identity and obtains network credentials (Security)
- kdestroy, which destroys a principal's login context (Security)
- kinit, which obtains a ticket-granting ticket (Security)
- klist, which lists tickets (Security)
- rgy_edit, which invokes the registry database editor (Security)
- rpccp, which invokes the RPC Control Program
- sec_admin, which invokes the DCE Security Administration utility

If you choose not to execute this command definition file, you cannot use any of the previous programs and commands.

DCE$DEFINE_OPTIONAL_COMMANDS.COM, the optional command definition file, is installed with the Application Development kit and defines the following foreign commands:

- idl, which invokes the IDL compiler
- rpclm, which invokes the RPC Log Manager
- uuidgen, which invokes the UUID generator utility

By default, these utilities use DCL-style interfaces. If you execute the optional foreign commands file, you have access to the version of these utilities that uses the universal interface. There are three possible actions that you can take:

- Define the universal interface for all users on your system to ensure that the same interface is available to users across operating system platforms. Note that all examples that document these four utilities use the universal interface. Include the following line in the file SYS$MANAGER:SYLOGIN.COM:

  ```
  $ @SYS$COMMON:[DCE$LIBRARY]DCE$DEFINE_OPTIONAL_COMMANDS.COM
  ```

- Give users access to only the DCL-style interface. In this case, you do not need to take any action.
- Make the DCL-style interface available to some users, but allow others access to the universal interface. Do not define the optional commands in SYLOGIN.COM. Tell users who want to use the universal interface to include the following line in their account's LOGIN.COM procedure:

  ```
  $ @SYS$COMMON:[DCE$LIBRARY]DCE$DEFINE_OPTIONAL_COMMANDS.COM
  ```

6. If you are installing DCE on a VMScluster, you must take the following steps:

   a. Ensure that a license is registered and loaded on each node in the cluster from which users plan to use DCE. (If you are installing only the Compaq DCE Runtime Services Kit, you already have a right to use the DCE Runtime Services Kit. This right was granted with the OpenVMS operating system license.)

   b. Configure each node in the cluster from which users plan to use DCE by entering the following command:

      ```
      $ @SYS$MANAGER:DCE$SETUP CONFIG
      ```

3.2 Installation Error Recovery

The following list describes errors that you may encounter during installation and provides suggestions about how to recover from those errors:

- **You try to install the OpenVMS VAX kit on an OpenVMS Alpha system (or vice versa).**

  Reinstall with the correct kit.

- **The system does not have the required version of OpenVMS installed.**

  Upgrade the operating system to at least the minimum required version and restart the installation procedure.

- **You run out of disk space.**

Either clean up your disk or install less of the kit.

- **If you plan to run DCE applications by IP, you must have UCX Version 4.2 installed.**

  Install the correct version of UCX. The installation procedure checks for the prerequisites.

- **No network transports were found.**

  You must install and configure DECnet, UCX, or both before running any DCE applications.

- **SYS$SYSTEM:RIGHTSLIST.DAT does not exist on this system.**

  RUN AUTHORIZE and then issue the CREATE/RIGHTS command. RIGHTSLIST.DAT is created for you.

- **Invalid UIC.**

  Find and enter the correct UIC in the correct format.

4

Configuring a DCE Cell

This chapter describes the steps necessary to set up a DCE cell, and the DCE system configuration utility for Compaq DCE for OpenVMS VAX and OpenVMS Alpha. Note that DCE must be configured.

4.1 Overview of the DCE Cell

A cell is the basic DCE unit. It is a group of networked systems and resources that share common DCE services. Usually, the systems in a cell are in the same geographic area, but cell boundaries are not limited by geography. A cell can contain from one to several thousand systems. The boundaries of a cell are typically determined by its purpose, as well as by security, administrative, and performance considerations.

A DCE cell is a group of systems that share a namespace under a common administration. The configuration procedure allows you to configure your system as a DCE client, create a new DCE cell, add a master Cell Directory Service (CDS) server, add a replica CDS server, and add a Distributed Time Service (DTS) local server. When you create a new cell, you automatically configure a Security server.

You do not need to create a DCE cell if you are using only the DCE Remote Procedure Call (RPC) and if your applications use only explicit RPC string bindings to provide the binding information that connects server to clients. If there are other systems in your network already using DCE services, it is possible there may be an existing cell that your system can join. If you are not sure, consult your network administrator to find out which DCE services may already be in use in your network.

At a minimum, a cell configuration includes the DCE Cell Directory Service, the DCE Security Service, and the DCE Distributed Time Service. One system in the cell must provide a DCE Directory Service server to store the cell namespace database. You can choose to install both the Cell Directory Server and the Security Server on the system from which you invoked the procedure, or you can split the two servers and put them on different systems.

Note

You must run the installation and configuration procedures on the system where you are creating a cell before you install and configure DCE on the systems that are joining the cell.

Configuring a DCE Cell
4.1 Overview of the DCE Cell

4.1.1 Creating a Cell

All DCE systems participate in a cell. If you are installing DCE and there is no cell to join, the first system on which you install the software is also the system on which you create the cell. Remember that this system is also the DCE Security Server. You can also make this system your Cell Directory Server.

When you create a cell, you must name it. The cell name must be unique across your global network. The name is used by all cell members to indicate the cell in which they participate. The configuration procedure provides a default name that is unique and is easy to remember. If you choose a name other than the default, the name must be unique. If you want to ensure that separate cells can communicate, the cell name must follow BIND or X.500 naming conventions.

4.1.2 Joining a Cell

Once the first DCE system is installed and configured and a cell is created, you can install and configure the systems that join that cell. During configuration, you need the name of the cell you are joining. Ask your network administrator for the cell name.

4.1.3 Defining a Cell Name

You need to define a name for your DCE cell that is unique in your global network and is the same on all systems that participate in this cell. The DCE naming environment supports two kinds of names: global names and local names. All entries in the DCE Directory Service have a global name that is universally meaningful and usable from anywhere in the DCE naming environment. All Directory Service entries also have a cell-relative name that is meaningful and usable only from within the cell in which that entry exists. If you plan to connect this cell to other DCE cells in your network either now or in the future, it is important that you choose an appropriate name for this cell. You cannot change the name of the cell once the cell has been created. If you are not sure how to choose an appropriate name for your DCE cell, consult Chapter 9 of the *Compaq DCE for OpenVMS VAX and OpenVMS Alpha Product Guide*, or the section on global names in the *OSF DCE Administration Guide — Introduction*. Before you can register the cell in X.500, you must ensure that the Compaq X.500 Directory Service kit is installed on your CDS server.

Compaq recommends that you use the following convention to create DCE cell names: the Internet name of your host system followed by the suffix –cell, followed by the Internet address of your organization. For example, if the Internet name of your system is myhost, and the Internet address of your organization is smallco.bigcompany.com, your cell name, in DCE syntax, would be myhost-cell.smallco.bigcompany.com. This convention has the following benefits:

- The Internet name of your host is unique in your network, so if all DCE users in your network follow this convention, your cell name will also be unique.
- It clearly identifies the system on which the writable copy of the root directory of the cell namespace is located.
- It does not prohibit intercell communication with outside organizations.
- It is easy to remember.

If there is already a cell name defined in a previously existing DCE system configuration, do not change it unless you are removing this system from the cell in which it is currently a member and you are joining a different cell.

When the configuration procedure prompts you for the name of your DCE cell, type the cell name without the /.../ prefix; the prefix is added automatically. For example, if the full global name selected for the cell, in DCE name syntax, is /.../myhost-cell.smallco.bigcompany.com, enter myhost-cell.smallco.bigcompany.com.

4.1.4 Defining a Host Name

You need to define a name for your system that is unique within your DCE cell. You should use the default host name, which is the Internet host name (the name specified before the first dot(.)). The following example shows the default host name derived from the Internet name of myhost.mycompany.com.

```
Please enter your DCE host name [myhost]:
```

4.1.5 Intercell Naming Using DNS

This section provides tips on defining a cell name in the Domain Name System (DNS). Names in DNS are associated with one or more data structures called resource records. The resource records define cells and are stored in a data file. For TCP/IP Services for OpenVMS, this file is called SYS$SPECIFIC:[TCPIP$BIND]<domain name>.DB.

If you are using a UNIX DNS Bind server, it is called /etc/namedb/hosts.db. To create a cell entry, you must edit the data file and create two resource records for each CDS server that maintains a replica of the cell namespace root. The following example shows a cell called ruby.axpnio.dec.com. The cell belongs to the BIND domain axpnio.dec.com. Host alo010.axpnio.dec.com is the master CDS server for the ruby.axpnio.dec.com cell. The BIND server must be authoritative for the domains of the cell name. The BIND master server requires the following entries in its data file:

```
alo010.axpnio.dec.com I A 25.0.0.149
ruby.axpnio.dec.com IN MX 1 alo010.axpnio.dec.com
ruby.axpnio.dec.com IN TXT "1 c8f5f807-487c-11cc-b499-08002b32b0ee
Master /.../ruby.azpnio.dec.com/alo010_ch
c84946a6-487c-11cc-b499-08002b32b0ee alo010.axpnio.dec.com"
```

Note

TXT records must span only one line. The third entry above incorrectly occupies three lines to show the information included in the TXT record. You need to do whatever is required with your text editor of choice to ensure this. Widening your window helps. You should also ensure that the quotes are placed correctly and that the host name is at the end of the record.

The information to the right of the TXT column in the Hesiod Text Entry (that is, 1 c8f5f807-48...) comes directly from the cdscp show cell /.: as dns command. For example, to obtain the information that goes in the ruby.axpnio.dec.com text record (TXT), you would go to a host in the ruby cell, and enter the cdscp show cell /.: as dns command. Then, when the system displays the requested information, cut and paste this information into the record. This method ensures that you do not have any typing errors.

To ensure that the records that you have entered are valid, restart the DNS Bind server process.

4.1.6 Intercell Naming Using LDAP/X.500

This section provides tips on defining a cell name in LDAP/X500.

The cells that will communicate using intercell must be part of the same LDAP/X500 namespace. This is true only if they share a common root in the namespace tree. For example, the cells `/c=us/o=compaq/ou=laser-cell` and `/c=us/o=compaq/ou=ruby-cell` share the root `/c=us/o=compaq`, and would be able to participate in intercell communications.

If your cell is part of an X.500 namespace, answer Yes to the question "Do you want to register the DCE cell in X.500?". If your cell is part of an LDAP namespace, answer Yes to the question "Do you want to register the DCE cell in LDAP?". Additional information about Intercell operations can be found in Chapter 9 of the *Compaq DCE for OpenVMS VAX and OpenVMS Alpha Product Guide*.

4.2 The DCE System Configuration Utility — DCE$SETUP.COM

The DCE$SETUP command procedure begins the configuration process. Many of the system configuration utility prompts have default values associated with them. The default responses are based on your existing configuration, if you have one. Otherwise, default values for the most common DCE system configurations are provided. At each prompt, press RETURN to take the default displayed in brackets, type a question mark (?) for help, or supply the requested information.

The system configuration utility sets up the DCE environment on your node so that you can use DCE services. The system configuration utility leads you through the process of creating or joining a cell.

Note

If you are installing Compaq DCE for OpenVMS VAX or OpenVMS Alpha Version 3.0 over a previous version of DCE, you do not have to reconfigure DCE after the installation. Before the installation, stop the DCE daemons with the following command:

```
$ @SYS$MANAGER:DCE$SETUP CLEAN
```

Then, after the installation, enter the following command:

```
$ @SYS$MANAGER:DCE$SETUP START
```

You must configure if you are installing DCE for the first time or reconfigure if you are installing a new version over DCE Version 1.0.

If you are installing DCE over an existing Compaq DCE for OpenVMS VAX or OpenVMS Alpha, perform the following steps:

1. Stop the DCE daemons with the following command:

   ```
   $ @SYS$MANAGER:DCE$SETUP CLEAN
   ```

2. If installing DCE over version 1.5 of Compaq DCE for OpenVMS VAX or OpenVMS Alpha, also perform the following step to stop the RPC daemon:

   ```
   $ @SYS$MANAGER:DCE$RPC_SHUTDOWN
   ```

3. After the installation, enter the following command:

   ```
   $ @SYS$MANAGER:DCE$SETUP START
   ```

4.2.1 Configuring LDAP, NSI, and GDA

The Lightweight Directory Access Protocol (LDAP) provides access to the X.500 directory services without the overhead of the full Directory Access Protocol (DAP). The simplicity of LDAP, along with the powerful capabilities it inherits from DAP, makes it the defacto standard for Internet directory services and for TCP/IP.

Inside a cell, a directory service is accessed mostly through the name service interface (NSI) implemented as part of the run-time library. Cross-cell directory service is controlled by a global directory agent (GDA), which looks up foreign cell information on behalf of the application in either the Domain Naming Service (DNS) or X.500 database. Once that information is obtained, the application contacts the foreign CDS in the same way as the local CDS.

Once LDAP is configured, applications can request directory services from either CDS or LDAP or both. LDAP is provided as an optional directory service that is independent of CDS and duplicates CDS functionality. LDAP is for customers looking for an alternative to CDS that offers TCP/IP and Internet support.

With LDAP directory service available, GDA can look up foreign cell information by communicating through LDAP to either an LDAP-aware X.500 directory service or a standalone LDAP directory service, in addition to DNS and DAP.

Note that DCE for OpenVMS provides it's own client implementation of LDAP. Prior to installing DCE, a DCE administrator must obtain LDAP server software and install it as an LDAP server in the environment. Next, a DCE administrator must choose LDAP during the DCE installation and configuration procedure and intentionally configure LDAP directory service for a cell.

4.2.2 Kerberos 5 Security

The DCE authentication service is based on Kerberos 5. The Kerberos Key Distribution Center (KDC) is part of the DCE Security Server `secd`. The authorization information that is created by the DCE for OpenVMS privilege server is passed in the Kerberos 5 ticket's authorization field.

DCE provides a Kerberos configuration program (DCE$KCFG.EXE) to assist in the interoperability between DCE Kerberos and standard Kerberos. To find out more information about the `kcfg` program, use the following two commands.

To display individual command switches and their arguments enter:

```
kcfg -?
```

To display a short description of the command and what it does enter:

```
kcfg -h
```

This provides information on the configuration file management, principal registration, and service configuration.

Note

The dcesetup configuration script sets all tickets as forwardable, a default value. If tickets are not set as forwardable, the Kerberos Distribution Center (KDC) server does not provide authentication and authorization information to the telnet process. The command, `kinit -f`, marks tickets as forwardable.

All machines within a cell that plan to use Kerberos-enabled tools need to check and possibly modify the registry and the krb5 configuration with the kcfg executable.

To make sure that Kerberos Version 4 interoperates with Kerberos Version 5, an administrator can use the kcfg -k command to change krb.conf entries. This command needs to be entered on each machine in the cell.

The registry must contain a principal entry that describes the host machine of the KDC server. This principal entry is of the form host/<hostname>. The principal and the associated keytable entry can be created with kcfg -p. This verifies that the host entry exists; if not, it creates the host entry.

4.2.3 Starting the System Configuration Utility

You must be logged in as a privileged user. The SHOW command requires only NETMBX and TMPMBX privileges. All other commands require WORLD, SYSPRV, CMKRNL, and SYSNAM privileges. The CONFIG command requires BYPASS privileges.

You can use the same command to perform an initial configuration or to reconfigure DCE. See the Appendix for several sample configurations. To start the system configuration utility, at the DCL prompt enter the following command:

```
$ @SYS$MANAGER:DCE$SETUP
```

The DCE System Management Main Menu appears:

```
                DCE System Management Main Menu
                       DCE for OpenVMS Alpha V3.0

     1)  Configure     Configure DCE services on this system
     2)  Show          Show DCE configuration and active daemons
     3)  Stop          Terminate all active DCE daemons
     4)  Start         Start all DCE daemons
     5)  Restart       Terminate and restart all DCE daemons
     6)  Clean         Terminate all active DCE daemons and remove
                        all temporary local DCE databases
     7)  Clobber       Terminate all active DCE daemons and remove
                        all permanent local DCE databases
     8)  Test          Run Configuration Verification Program

     0)  Exit          Exit this procedure
     ?)  Help          Display helpful information

Please enter your selection:
```

Enter 1 to view the DCE Configuration Menu. To skip the previous menu and go directly to the DCE Configuration Menu, enter the following command:

```
$ @SYS$MANAGER:DCE$SETUP CONFIG
```

For information on how to configure a DCE cell or how to add a client, see Chapter 5. For information on modifying an existing configuration, see Chapter 6.

5
Configuring DCE

This chapter explains how to create a cell and configure the Security server and CDS server on the same system. It also discusses how to configure a client system into an existing DCE cell.

5.1 DCE System Management Command Procedure

In DCE for OpenVMS Version 3.0, the DCE system management command procedure SYS$MANAGER:DCE$SETUP.COM has been changed. These changes are described in the following sections.

An RPC only configuration can be started with the startup command procedure described in the next section. DCE$SETUP stops RPCD during configuration. In DCE for OpenVMS Version 1.5, DCE$SETUP was modified not to stop RPCD. Changes in the DCE daemons required reverting to the previous behavior. DCE$SETUP.COM has been rewritten to add the new functionality for DCE R1.2.2, and to more closely match the configuration program for DCE for Tru64 UNIX.

5.1.1 Starting and Stopping the RPC Daemon

The RPC daemon can be started and stopped with the command files DCE$RPC_STARTUP.COM and DCE$RPC_SHUTDOWN.COM. These files are located in SYS$COMMON:[SYSMGR].

To start the RPC daemon, execute DCE$RPC_STARTUP.COM. You can specify the following option:

```
[NO]CONFIRM          Turns user prompting on or off.  CONFIRM is the default.
```

To stop the RPC daemon, execute DCE$RPC_SHUTDOWN.COM. You can specify the following options in any order:

```
[NO]CONFIRM          Turns user prompting on or off.  CONFIRM is the default.
CLEAN                Deletes all entries from the RPC endpoint database.
```

Note

Do not stop the RPC daemons if any RPC applications are running on the system.

5.1.2 Limiting RPC Transports

The RPC daemon can limit the protocols used by RPC applications. To restrict the protocols that can be used, set a logical name RPC_SUPPORTED_PROTSEQS to contain the valid protocols separated by a colon. Valid protocols are `ncadg_ip_udp`, `ncacn_ip_tcp`, and `ncacn_dnet_nsp`. For example:

```
$ DEFINE RPC_SUPPORTED_PROTSEQS "ncadg_ip_udp:ncacn_ip_tcp"
```

This prevents applications and servers from registering endpoints that utilize DECnet.

5.1.3 Logical Names Created During Configuration

The configuration process creates the following logical names:

Logical Name	Description
DCE	Defines a search list pointing to directories SYS$COMMON:[DCE$LIBRARY] and SYS$LIBRARY. These directories contain the Application Developer's Kit include files and other files for creating DCE applications.
DCE$COMMON,DCE_ COMMON	Points to the directory SYS$COMMON:[DCELOCAL]. This directory holds DCE-specific files common to all DCE hosts in a cluster.
DCE$LOCAL,DCE_LOCAL	Points to the directory DCE$SPECIFIC:. This directory defines the top of the DCE directory hierarchy.
DCE$SPECIFIC	Points to the directory SYS$SPECIFIC:[DCELOCAL]. This directory is for internal use only.
DCE$SYSROOT	Points to the directories DCE$SPECIFIC:, DCE$COMMON:. This logical is used to find DCE files that may be in either system-specific or cluster-general trees.
TCL_LIBRARY	Points to the directory DCE_COMMON/TCL (UNIX file syntax). This directory holds files that allow the TCL interface to the DCE command line programs to function.

The logical names with a dollar sign in them define VMS style directory syntax. The logical names with underscores in them define UNIX style directory syntax (for use by various DCE internal applications).

5.1.4 Configuring on a VMScluster

You must configure each node in a VMScluster separately by entering the following command on each node:

```
$ @SYS$MANAGER:DCE$SETUP CONFIG
```

5.2 Overview of New Cell Configuration

To configure a new cell, you must complete the following steps:

1. To begin your initial cell creation and server configuration, invoke the DCE configuration utility.
2. If you are creating a new cell or adding a CDS server, choose option 6 (Terminate all active DCE daemons and remove all temporary local DCE databases) to stop the DCE daemons in a controlled manner. Be sure to back up your security and CDS databases before proceeding if this has not been done.
3. Choose option 1 from the DCE Setup Main Menu to configure DCE services on your system. You must have system privileges to modify the DCE system configuration.

The procedure displays the following menu:

```
          DCE Configuration Menu
          DCE for OpenVMS Alpha V3.0

   1)  Client           Configure this system as a DCE client
   2)  New Cell         Create a new DCE cell
   3)  CDS Server       Add Master CDS Server
   4)  Modify           Modify DCE cell configuration
   5)  RPC_Only         Configure this system for RPC only

   0)  Exit             Exit this procedure
   ?)  Help             Display helpful information

Please enter your selection:
```

Table 5–1 provides descriptions of the options available on the DCE Configuration Menu.

Table 5–1 Configuration Menu Options

Option	Description
Client	Provides full DCE RPC services, client services for CDS and Security, and optional time services. A DCE client system must join an existing DCE cell with a security registry and a CDS master server available on other systems in the cell.
New Cell	Provides full DCE RPC services, a security registry server for the cell, a CDS master server, a DTS server, and the NSI agent for name service independent access to directory services from PC client systems. There can be only one security registry and CDS master server in a cell, although they need not reside on the same host.
CDS Server	Provides a DCE client system with a CDS master server added. This option is used if a split server configuration is desired, and the new cell (on another system) was configured without a CDS master server.
Modify	Provides a submenu of additional configuration options that are available after the initial configuration has completed.
RPC_Only	Provides a subset of the DCE RPC services. If DCE Version 3.0 is installed on an OpenVMS Alpha system running Version 7.2-1 or higher, NTLM security may be utilized for authenticated RPC requests. With an RPC only configuration, there are no RPC name service interface routines available. This configuration will, however, allow applications to communicate if full string bindings are supplied by the RPC client, or if the client requests the port number to complete the partial string binding from the end point mapper (DCED daemon).

4. Choose option 2 to create a new DCE cell.
5. At each prompt, you can press RETURN to take the default displayed in brackets or enter a question mark (?) for help. When prompted, select a cell name and a host name; the name is used again when you configure DCE client systems.
6. The configuration utility asks if you want to configure the host as a CDS server. Answer Y to configure the CDS and security servers on the same system. Answer N to perform a split server installation in which you configure the security server on the current host and the CDS server on a different host.

7. If you answered Y to configure the CDS and security servers on the same system, the utility asks:

   ```
   Will there be any DCE pre-R1.1 CDS servers in this cell? (YES/NO/?) [N]:
   ```

   If your cell will be running any CDS servers based on OSF DCE Release 1.0.3a or lower (equivalent to Compaq DCE for OpenVMS Version 1.5 or lower), you should answer Y. The configuration utility sets the directory version number to 3.0 for compatibility with pre-R1.1 servers. This setting disables the use of OSF DCE Release 1.1 features such as alias cells, CDS delegation ACLs, and so on.

   If all CDS servers in your cell will be based on Compaq DCE for OpenVMS Version 3.0 (or higher) and based on OSF DCE Release 1.1 (or higher), answer N.

   The configuration utility sets the directory version number to 4.0 for compatibility with Compaq DCE for OpenVMS Version 3.0 CDS servers (OSF DCE Releases 1.2.2). This enables the use of OSF DCE Release 1.1 features such as alias cells, CDS delegation ACLs, and so on, and OSF DCE Release 1.2.2 features. Once the directory version is set to 4.0, you cannot set it back to 3.0.

8. You are prompted to confirm the system time; it is important that you check the current time before you respond.

9. The configuration utility will prompt for the Domain Name and DNS server address.

10. If DECnet/OSI is installed on your system, the configuration utility displays the following message and then asks several questions about configuring a DCE Distributed Time Service server on your system.

    ```
    You seem to have DECnet/OSI installed on this system. DECnet/OSI
    includes a distributed time synchronization service (DECdts), which
    does not currently support the DCE Distributed Time Service (DCE DTS)
    functionality. The DCE DTS in this release provides full DECdts
    functionality. This installation will stop DECdts and use DCE DTS
    instead. For further clarification, please consult the Compaq DCE
    for OpenVMS VAX and OpenVMS Alpha Product Guide.
    ```

    Even though DCE DTS will be used, it is possible to accept time from DECdts servers.

    ```
    Should this node accept time from DECdts servers? (YES/NO/?) [N]:

    Do you want this system to be a DTS Server (YES/NO/?) [Y]:

    Do you want this system to be a DTS Global Server (YES/NO/?) [N]:

    Does this cell use multiple LANs? (YES/NO/?) [N]:
    ```

    Answer the questions appropriately.

11. The configuration utility asks if you want to run the MIT Kerberos 5 services on this machine. A Y answer runs the configuration utility.

    ```
    Do you intend to run MIT Kerberos 5 services on this machine? (YES/NO/?)  [N]
    ```

12. The configuration utility asks if you want to configure the LDAP name service on this system. A yes answer prompts the question, "Do you want to configure the system as an LDAP client?" and requires that you enter further information regarding LDAP services.

    ```
    Do you want to configure the LDAP name service? (YES/NO/?) [N]:
    ```

13. The configuration utility asks if you want to configure gdad to use LDAP. (gdad is the daemon for Global Directory Agent.)

```
Do you want to configure gdad to use LDAP? (YES/NO/?) [N]:
```

14. Next, the screen displays your selections and asks whether to save them as your DCE system configuration. Answer Y.

15. All previous temporary and permanent DCE databases and configuration files are now removed prior to starting the new configuration.

16. The configuration utility asks you to enter some random keystrokes in order to supply a keyseed for the security server.

```
*********************************************************************
*  Starting the security server requires that you supply            *
*  a 'keyseed.'  When asked for a 'keyseed,' type some              *
*  random, alphanumeric keystrokes, followed by RETURN.             *
*  (You won't be required to remember what you type.)               *
*********************************************************************

Enter keyseed for initial database master key:
```

17. The configuration utility asks you to enter the password for the cell_admin account, and asks for confirmation.

```
Please type new password for cell_admin (or '?' for help):

Type again to confirm:
```

18. The DCE daemons are started and configuration information is set up. After the dts daemon is started, you are prompted to run the DCE Configuration Verification Program (CVP). Press RETURN to start the CVP.

19. To verify that all requested services are configured, choose option 2 (Show DCE configuration and active daemons) from the DCE Setup Main Menu. The screen displays all configured DCE services and active DCE daemons.

You have completed creating a cell.

5.3 Configuring Your System as a DCE Client with Run-Time Services

If you want to add your system to an existing cell, choose option 1 (Configure this system as a DCE Client) from the Configuration Choice Menu. This option configures the run-time services subset on your system.

Note

During the initial DCE client configuration, the client software may have problems locating the Cell Directory Service server if the Internet protocol netmask for your client machine is not consistent with the netmask used by other machines operating on the same LAN segment. You might need to consult your network administrator to determine the correct value to use as a netmask on your network.

When you choose option 1, the procedure displays the following messages:

```
Starting DCE client configuration . . .

At each prompt, enter your response.  You may enter RETURN for
the default response, displayed in [brackets], or '?' for help.
Entering a CONTROL-Z will terminate this configuration request.

Press RETURN to continue . . .

Removing temporary local DCE databases and configuration files

Removing permanent local DCE databases and configuration files

               Starting client configuration

    Initializing RPC & Security Client Services daemon (DCE$DCED) . . .
%RUN-S-PROC-ID, identification of created process is 2380A9A6

    Starting RPC & Security Client Services daemon (DCE$DCED) . . .
% RUN-S-PROC-ID, identification of created process is 238110A8
```

The configuration utility asks whether to search the LAN for known cells within the broadcast range of your system.

```
Would you like to search the LAN for known cells? (YES/NO/?) [Y]:
```

If you know the name of your DCE cell, answer N. As prompted, supply the name of your DCE cell, your DCE host name, and the host name of your cell's master CDS server. You also need to specify whether your host can broadcast to the host where the master CDS server is installed.

Answer Y to see a list of available DCE cells. As prompted, supply your DCE host name. At the next prompt, supply the appropriate DCE cell name from the list.

```
    Gathering list of currently accessible cells (please wait)

Please enter your DCE hostname [dcehost]:

The following cells were discovered within broadcast range of this system:

Buster-cell
Kauai-cell
Myhost-cell
Tahoe-cell

Please enter the name of your DCE cell [buster-cell]:
```

If you do not know the name of the cell you want to join, consult your network administrator. Do not add the /.../ prefix to the cell name; the procedure automatically adds it.

The prompt might contain a cell name that is the last configured cell name for this host or the first cell name from the alphabetical list of available cells. If you enter a cell name that is not on the list of cell names, the procedure assumes you are performing a WAN configuration, and asks you whether the CDS server is located on the same LAN or subnet.

```
Is the CDS Master Server within broadcast range (YES/NO/?) [N]:
```

After you enter your cell name, the procedure continues, displaying information similar to the following, but dependent on your configuration:

```
Terminating RPC Services/Dce Security Client daemon (DCE$DCED) . . .

        ***  RPC (DCED) shutdown successful  ***

    Starting RPC & Security Client Services daemon (DCE$DCED) . . .
% RUN-S-PROC-ID, identification of created process is 238110B0
```

```
    Starting CDS Name Service Advertiser daemon (DCE$CDSADVER) . . .
% RUN-S-PROC-ID, identification of created process is 238110B1

    Starting CDS Name Service Client daemon (DCE$CDSCLERK) . . .
% RUN-S-PROC-ID, identification of created process is 238110B2

Could not find security master using dcecp registry show

            Attempting to locate security server
            Found security server
            Creating dce$local:[etc.security]pe_site.; file
            Checking local system time
            Looking for DTS servers in the LAN profile
            Looking for Global DTS servers in this cell
            Found DTS server

    The local system time is: Wed October 13 12:01:14 1999

Is this time correct? (y/n):
```

Make sure you check that the correct time is displayed before you continue with the configuration. If the time is incorrect, answer N, and the procedure exits to the operating system to allow you to reset the system time. After you correct or verify the time, answer Y, and the procedure resumes.

If DECnet/OSI is installed on your system, the configuration utility displays the following message and then asks several questions about configuring a DCE Distributed Time Service server on your system.

```
You seem to have DECnet/OSI installed on this system. DECnet/OSI
includes a distributed time synchronization service (DECdts), which
does not currently support the DCE Distributed Time Service (DCE DTS)
functionality. The DCE DTS in this release provides full DECdts
functionality.  This installation will stop DECdts and use DCE DTS
instead.  For further clarification, please consult the Compaq DCE
for OpenVMS VAX and OpenVMS Alpha Product Guide.
```

Even though DCE DTS will be used, it is possible to accept time from DECdts servers.

```
Should this node accept time from DECdts servers? (YES/NO/?) [N]:
```

Answer Y to accept time from any DECnet/OSI DECdts server; however, time from this source is unauthenticated. If you answer N, this system accepts time only from DCE time servers.

If DECnet/OSI is not installed on your system, the configuration utility omits the previous DECdts questions and instead, asks:

```
Do you need the Distributed Time Service (YES/NO/?) [Y]:
```

Answer Y to configure the host as a DTS client.

The configuration utility asks if you want to run the MIT Kerberos 5 services on this machine. An answer of Y runs the configuration utility.

```
Do you intend to run MIT Kerberos 5 services on this machine? (YES/NO/?)  [N]:
```

After you respond to the prompt, the procedure stops the CDS advertiser and clerk and asks you to perform a dce_login operation, as follows:

```
    Terminating CDS Name Service Advertiser daemon (DCE$CDSADVER) . . .

    Terminating CDS Name Service Client daemon (DCE$CDSCLERK) . . .

Please enter the principal name to be used [cell_admin]:
Please enter the password for principal "cell_admin" (or ? for help):
```

Obtain the password from your system administrator. After you perform the dce_login operation, the procedure begins configuring the security client software. If this system was previously configured as a DCE client or your cell has another host with the same name, the configuration utility also displays a list of client principals that already exist for this system and asks whether to delete the principals. You must delete these principals to continue with the configuration.

```
    Configuring security client
     Creating Dce$Specific:[krb5]krb.conf

The following principal(s) already exist under /hosts/dcehost/:

/./buster-cell/hosts/dcehost/self


Do you wish to delete these principals? (YES/NO/?) [Y]:

        Deleting client principals

        Creating ktab entry for client

    Terminating RPC & Security Client Services daemon (DCE$DCED) . . .

    Starting RPC & Security Client Services daemon (DCE$DCED) . . .
%RUN-S-PROC-ID, identification of created process is 238110B3

    Starting sec_client service (please wait).


    This machine is now a security client.

Press <RETURN> to continue . . .

    Configuring CDS client
        Creating the cds.conf file

    Starting CDS Name Service Advertiser daemon (DCE$CDSADVER) . . .
%RUN-S-PROC-ID, identification of created process is 238110B4

    Starting CDS Name Service Client daemon (DCE$CDSCLERK) . . .
%RUN-S-PROC-ID, identification of created process is 238110B5

Testing access to CDS server (please wait).


Logging in to DCE using principal "cell_admin" . . .
Checking TCP/IP local host database address of "dcehost". Please wait . . .

Configuring client host objects in cell namespace . . .

        Creating /.:/hosts/dcehost objects in name space

Checking TCP/IP local host database for address of "dcehost". Please
wait . . .
```

If your cell uses multiple LANs, you are prompted as follows:

```
Please enter the name of your LAN [1.2.3]:
```

If your LAN has not been defined in the namespace, you are asked whether you want to define it. The configuration procedure then continues:

```
    This machine is now a CDS client.

        Stopping sec_client service...

    Starting sec_client service (please wait).
```

```
            Modifying acls on /.:/hosts/dcehost/config
               secval
               xattrschema
               srvrexec
               keytab
               keytab/self
               hostdata
               hostdata/dce_cf.db
               hostdata/cell_name
               hostdata/pe_site
               hostdata/cds_attributes
               hostdata/cds_globalnames
               hostdata/host_name
               hostdata/cell_aliases
               hostdata/post_processors
               hostdata/svc_routing
               hostdata/cds.conf
               hostdata/passwd_override
               hostdata/group_override
               hostdata/krb.conf
               srvrconf
        Logging in to DCE using principal "cell_admin" . . .

            Configuring DTS daemon as client (DCE$DTSD)

            Starting Distributed Time Service daemon (DCE$DTSD) . . .
        %RUN-S-PROC-ID, identification of created process is 238110B5
    This machine is now a DTS clerk.

    Do you want to run the DCE Configuration Verification Program? (YES/NO/?) [Y]:
```

The DCE Configuration Verification Program (CVP) exercises the components of DCE that are running in this cell. It requires approximately 1 to 2 minutes to run.

If you type y to run the CVP at this time, you see the following display:

```
Executing DCE for OpenVMS Alpha V3.0 CVP (please wait)

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.
.
.
.
.
.
.
.
.
.
.

DCE for OpenVMS Alpha V3.0 CVP completed successfully
```

When the procedure is completed, the DCE Setup Main Menu is displayed again.

5.4 Split Server Configuration (Adding a Master CDS Server)

This section discusses a split server installation in which a new cell and the master Security Server are created on one system and the master CDS Server is configured on another system. The master CDS Server maintains the master replica of the cell root directory.

A split server configuration has four phases:

- Begin creating the new cell and master Security Server on one system.
- Begin creating the master CDS Server on another system.
- Complete creating the new cell and master Security on the first system.
- Complete creating the master CDS Server on the second system.

5.4.1 Creating a New Cell and Master Security Server

This is the first phase of a split server configuration. Begin this phase by creating the new cell on the machine where the master security server will reside. Choose option 2 (Create a new DCE cell) from the Configuration Choice Menu. Answer the prompts appropriately for the cell name and host name. Then answer N at the following prompt:

```
Do you wish to configure myhost as a CDS server? (YES/NO/?) [Y]: N
```

Proceed through the rest of the configuration answering the remaining questions as shown in section 5.1, until you get to the following:

```
*******************************************************************************
* This system has now been configured as a security server.                   *
* Since you chose not to configure this system as a CDS server,               *
* you must now configure another system as the Master CDS Server              *
* for this cell (Option 1 on the dcesetup Main Menu, Option 3 on              *
* the Configuration Choice Menu.)                                             *
*                                                                             *
* When the Master CDS server has been installed and configured,               *
* press the <RETURN> key to continue configuring this system.                 *
*******************************************************************************
```

Go to the machine where you will configure the master CDS Server.

5.4.2 Creating a Master CDS Server on Another System

This is the second phase of a split server configuration. You must have created a new cell and begun configuring the security server on another machine. Log on to the system on which you want to install the CDS master server, and choose option 3 (Add Master CDS Server) from the Configuration Choice Menu.

Answer the following prompts:

```
Please enter the name of your DCE cell []:

Please enter your DCE hostname [myhost2]:
```

The procedure asks:

```
Will there be any DCE pre-R1.1 CDS servers in this cell? (YES/NO/?) [N]:
```

If your cell will be running any CDS servers based on OSF DCE Release 1.0.3a or lower, you should answer Y. The configuration utility sets the directory version number to 3.0 for compatibility with pre-R1.1 servers. This disables the use of OSF DCE Release 1.1 features such as alias cells, CDS delegation ACLs, and so on.

If all CDS servers in your cell will be based on DCE for OpenVMS Version 3.0 or higher (or an equivalent DCE version based on OSF DCE Release 1.1 or higher) answer N. The configuration utility sets the directory version number to 4.0 for compatibility with DCE for OpenVMS (Version 3.0 or OSF DCE Release 1.1 or higher) CDS servers. This enables the use of OSF DCE Release 1.1 features such

as alias cells, CDS delegation ACLs, and so on. Once the directory version is set to 4.0, you cannot set it back to 3.0.

The procedure configures accordingly and prompts you to enter the host name of the security server that you just configured.

```
What is the hostname of the Security Server for this cell? []:
```

The configuration procedure continues, and requests additional client information as described in section 5.2. The procedure configures the requested services, and then prompts you to complete the configuration of the security server on the other machine before continuing:

```
*******************************************************************************
* This system has now been configured as the Master CDS Server.               *
*                                                                             *
* Before continuing, complete the configuration of the Security               *
* Server...                                                                   *
*******************************************************************************

  Press <RETURN> to continue:
```

Return to the system on which you configured the security server.

5.4.3 Completing the Security Server Configuration

This is the third phase of a split server configuration. You must have created a new cell and begun configuring the Security Server on one machine. Then you created a master CDS Server on another machine. Now you will complete the Security Server configuration on the first machine.

Return to the system on which you configured the Security Server and press the RETURN key. The following prompt is displayed:

```
What is the hostname of the Master CDS Server for this cell [ ]:
```

The configuration procedure proceeds as described in the section Overview of New Cell Configuration.

Once the Security Server configuration is complete, return to the host on which you are configuring the master CDS Server and complete the installation.

5.4.4 Completing the CDS Master Server Configuration

This is the fourth and final phase of a split server configuration. You must have created a new cell and begun configuring the security server on one machine. Then you created a master CDS server on another machine. You completed the security server configuration on the first machine. Now you will complete the CDS master server configuration.

Completion of this phase consists of running the configuration verification program:

```
Do you want to run the DCE Configuration Verification Program? (YES/NO/?) [Y]:
```

You can run the CVP now by answering Y, or you can run the CVP at a later time by answering N. The procedure completes the configuration and returns to the DCE Setup Main Menu. Choose option 2 (Show DCE configuration and active daemons) from the DCE Setup Main Menu to verify your configuration choices.

5.5 Migrating Your Cell

Some DCE cells may be running security or CDS servers on hosts with different versions of DCE. This might happen because a cell has DCE software from multiple vendors, each supplying upgrades at different times. Or perhaps upgrading all the hosts simultaneously is not feasible.

DCE for OpenVMS Version 3.0 security servers and CDS servers can interoperate with older servers (based on OSF DCE Release 1.0.3a, 1.0.2, and so on). However, new DCE security features associated with OSF DCE Release 1.1 and DCE Release 1.2.2 will generally not be available until all security server replicas in your cell are based on OSF DCE Release 1.1 and 1.2.2. Additionally, new CDS capabilities will not be available until all security servers and some or all CDS servers are based on OSF DCE Release 1.1 and 1.2.2.

If your cell contains older versions of Security or CDS Servers, you will need to migrate (gradually upgrade) older servers until all of them are running DCE server software based on OSF DCE Release 1.1 and 1.2.2. Once all Security or CDS Servers have been upgraded, you must perform some additional steps so that your servers can provide the new security and CDS capabilities.

Security Servers and CDS Servers use separate procedures to complete migration. Security Migration provides the instructions for completing Security server migration. CDS migration provides the instructions for completing CDS Server migration.

5.5.1 Security Migration

After you install the new security server version on a host where an older version security replica (master or slave) exists, that replica will operate with the new Security Server, but with the behavior of the older version server. Note that a server based on OSF DCE 1.1 or higher cannot create a new replica and operate it as an older version replica. Once OSF DCE Release 1.1 has been installed on all hosts that have security replicas, you must issue a single cell-wide command that simultaneously migrates all the replicas to operate at the level of DCE 1.1. At this point the cell will support new security features such as extended registry attributes.

Note

Once you have migrated the security servers to DCE 1.1 or higher, it is not possible to create a replica on a host running an earlier version.

If all of the Security Server replicas in your cell are based on OSF DCE Release 1.1, you can perform the final migration steps in this section.

If your cell is still running any Security Servers based on a DCE release prior to OSF DCE Release 1.1, do not complete the upgrade steps in this section. The upgrade steps will advance some security database attributes. Older servers cannot operate on newer version databases.

Once you have installed and configured DCE for OpenVMS Version 3.0 Security Servers in your cell, perform the following actions as cell administrator:

1. Ensure that at lease one security replica can write to the cell profile. Use the following operation to check the cell-profile ACL for: `user:dce-rgy:rw-t---`.

```
$ dcecp -c acl show -io /.:/cell_profile
```

2. On all Security Servers, set the server version to: secd.dce.1.1.

```
$ dcecp -c registry modify -version secd.dce.1.1
```

3. Verify that the version has been set to secd.dce.1.1.

```
$ dcecp -c registry show
```

Note

If you have not updated all 1.0.3 security replicas to DCE 1.1, any original 1.0.3 replicas will be stopped when you move the registry version forward to DCE 1.1. You may want to verify that any original 1.0.3 replicas are no longer running.

5.5.2 CDS Migration

If you have installed and configured DCE for OpenVMS Version 3.0 CDS servers in your cell, you might need to perform additional steps to complete the upgrade process.

If you created a new DCE cell and, during the dcesetup process, you set the default directory version information for each CDS server to Version 4.0, you do not need to perform the migration steps in this section.

If your cell is still running any security or CDS servers based on a DCE release prior to OSF DCE Release 1.1, do not complete the upgrade steps in this section. The upgrade steps will advance some security database and CDS directory attributes. Older servers cannot operate on newer version databases or directories.

DCE for OpenVMS Version 3.0 (or equivalent) features, such as hierarchical cells and alias cells, will be available only when all of your cell's security and CDS servers are running DCE for OpenVMS Version 3.0 or higher and the upgrade steps have been completed. Refer to the DCE for OpenVMS Product Guide and to the OSF DCE documentation for descriptions of available features.

Once the necessary DCE servers have been upgraded to DCE software based on OSF DCE Release 1.1 or 1.2.2, you can perform the migration steps in this section. The migration steps will enable the use of hierarchical cells, alias cells, and delegation.

Note

Directory version information can only be set forward. If you migrate a CDS server to OSF DCE 1.1 or 1.2.2 behavior, you cannot revert that server to 1.0.3 behavior.

Once you have installed and configured DCE for OpenVMS Version 3.0 (or equivalent) security servers and CDS servers, perform the following actions as cell administrator:

1. If you have not done so, perform the security migration steps in Security Migration.

2. For all CDS clearinghouses, manually update the CDS_UpgradeTo attribute to 4.0. The following two operations ensure that new directories created in this clearinghouse will receive the correct directory version number:

```
$ dcecp -c clearinghouse modify chname -add \{CDS_UpgradeTo 4.0 \}
$ dcecp -c clearinghouse verify chname
```

3. Manually upgrade all older directory version information to 4.0 as follows:

```
$ dcecp -c directory modify /.: -upgrade -tree
```

The `-tree` option operates recursively on all subdirectories (in this example, it operates on the entire cell). This command does not work unless all CDS servers housing the affected directories are running DCE for OpenVMS Version 3.0. This command can take a long time to execute depending on the size of the namespace.

5.6 Running the DCE Configuration Verification Program

Once the DCE daemons are started, you can run the DCE Configuration Verification Program (CVP) to ensure that the DCE services are properly installed. The procedure prompts you with the following message:

```
Do you want to run the DCE Configuration Verification Program? (YES/NO/?)[Y]:
```

If you enter Y or press RETURN, the procedure indicates that the CVP is running.

```
Executing DCE for OpenVMS Alpha V3.0 CVP (please wait)

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Verifying
.
.
.
.
.
.
.
.
.
.
.
```

The CVP invokes tests of the 10 DCE RPC interfaces, printing a dot (.) as each test is successful. A completely successful test execution results in 10 dots printed in succession. When the CVP tests are completed successfully, you receive the following message:

```
DCE for OpenVMS V3.0 CVP completed successfully
```

Note

You can repeat the CVP whenever you want by choosing option 8 (Run Configuration Verification Program) from the DCE Setup Main Menu.

After you run the CVP, the configuration procedure updates your system startup procedure so that the daemons restart automatically whenever the system is rebooted.

5.7 Error Recovery During Configuration

If the procedure encounters any errors during DCE system configuration, it displays error messages. Some errors are not fatal, and the procedure attempts to continue. Other errors are fatal, and the procedure terminates. If a fatal error is encountered while the procedure is starting the DCE daemons, the procedure attempts to stop any daemons that have already been started. This returns the system to its original state before you began the configuration.

If you receive an error message at any time while running the DCE System Configuration utility, you can get more detailed information about the cause of the error by examining the associated log file in SYS$MANAGER:DCE$SETUP.LOG. This log file contains a record of the operations invoked by the System Configuration utility the last time it was executed, and may help you diagnose the cause of the problem.

Sometimes the cause of an error is transitory and may not recur if you repeat the operation.

6
Modifying Cell Configuration

This chapter describes the steps you need to complete to modify a cell configuration.

6.1 Modify Configuration Menu

The Modify Configuration Menu varies slightly depending on which components are currently enabled. If a component is enabled, the menu displays the option to disable it. If the component is disabled, the menu displays the option to enable it. In the following view, all options are disabled.

```
*** Modify Configuration Menu ***

DCE for OpenVMS Alpha V3.0

 1)     Add Replica CDS Server
 2)     Add Replica Security Server
 3)     Change from DTS Global Server to DTS Local Server
 4)     Change from DTS Global Server to DTS clerk
 5)     Add Null Time Provider
 6)     Add NTP Time Provider
 7)     Enable Auditing
 8)     Enable DCE Integrated Login
 9)     Enable Kerberos 5
10)     Configure LDAP Name Service
11)     Add LDAP Client Service
12)     Enable LDAP GDA
13)     Register in X.500

 0)  Exit        Return to previous menu
 ?)  Help        Display helpful information

Please enter your selection:
```

Table 6–1 provides descriptions of the options available on the DCE Modify Configuration Menu.

Table 6–1 Modify Configuration Menu Options

Option	Description
Add Replica CDS Server	Adds a CDS Replica clearinghouse to the configuration on this host. The host must be an existing client or split cell configuration.
Add Replica Security Server	Adds a Security Replica to the configuration on this host. The host must be an existing client or split cell.
Change from DTS Global Server to DTS Local Server	Downgrades an existing DTS Global Server to a DTS Local Server on this host.

(continued on next page)

Table 6–1 (Cont.) Modify Configuration Menu Options

Option	Description
Change from DTS Global Server to DTS clerk	Downgrades an existing DTS Global Server to a DTS clerk on this host.
Add Null Time Provider	Adds a DTS Null Time Provider to the existing configuration on this host.
Add NTP Time Provider	Adds a DTS NTP Time Provider to the existing configuration on this host.
Enable Auditing	Enables the DCE auditing daemon to allow the capture and display of DCE audit trails.
Enable DCE Integrated Login	Provides support for Integrated Login, which combines the DCE and OpenVMS login procedures. See the *Compaq DCE for OpenVMS VAX and OpenVMS Alpha Product Guide* for information about Integrated Login.
Enable Kerberos 5	Enable DCE on this host to coexist with other Kerberos 5 implementations.
Configure LDAP Name Service	Configure the LDAP Name Service on this host to allow DCE to utilize LDAP as a transport for Intercell communications and NSID.
Add LDAP Client Service	Adds host-specific information in the LDAP namespace; that is, creates server, group, and profile entries for LDAP like those entries that are used for CDS during the DCE client configuration.
Enable LDAP GDA	Enables DCE's Global Directory Agent (GDA) to use LDAP to perform cross-cell directory service operations.
Register in X.500	Registers the host DCE information in the X.500 namespace, allowing the cell to use X.500 to perform cross-cell directory service operations.

6.2 Adding a Replica CDS Server

If you want to create a replica of the master CDS server on your machine, you can do so on a system that has already been configured as a client, or on a system that has not yet been configured for DCE. The following example assumes no prior configuration.

Choose option 1 (Add Replica CDS Server) from the Modify Configuration Menu. The configuration utility asks whether to search the LAN for known cells within broadcast range of your system.

```
Would you like to search the LAN for known cells? (YES/NO/?) [Y] :
```

If you know the name of your DCE cell, answer N. As prompted, supply the name of your DCE cell, your DCE host name, and the host name of your cell's master CDS server. You also need to specify whether your host can broadcast to the host where the master CDS server is installed.

Answer Y to see a list of available DCE cells. As prompted, supply your DCE host name. At the next prompt, supply the appropriate DCE cell name from the list.

You are asked to enter your DCE host name:

```
Please enter your DCE host name [myhost]:
```

The procedure then displays a list of the cells within broadcast range of your system and asks you to enter the name of your DCE cell. After you enter the cell name, the procedure displays the following messages and asks whether the local system time is correct:

```
Gathering list of currently accessible cells

The following cells were discovered within broadcast range of this system:

buster_cell
kauai_cell
myhost_cell
tahoe_cell

Please enter the name of your DCE cell: myhost_cell.

Please enter your DCE hostname [myhost]

    Terminating RPC Services/DCE Security Client daemon (DCE$DCED)  . . .

        *** RPC (DCED) shutdown successful  ***


    Starting RPC & Security Client Services daemon (DCE$DCED) . . .
%RUN-S-PROC-ID, identification of created process is 238110C0

    Starting CDS Name Service Advertiser daemon (DCE$CDSADVER) . . .
 %RUN-S-PROC-ID, identification of created process is 238110C1

    Starting CDS Name Service Client daemon (DCE$CDSCLERK) . . .
 %RUN-S-PROC-ID, identification of created process is 238110C2

Testing access to CDS server (please wait)...

        Attempting to locate security server
        Found security server
        Creating dce$local:[etc.security]pe_site.; file
        Checking local system time
        Looking for DTS servers in this LAN
        Found DTS server

    The local system time is: Wed Jul 12 11:31:52 1998

Is this time correct? (y/n):
```

Please check the time before you respond to this prompt.

Make sure you check that the correct time is displayed before you continue with the configuration. If the time is incorrect, answer N, and the procedure exits to the operating system to allow you to reset the system time. After you correct or verify the time, answer Y, and the procedure continues with the following message (if you have DECnet/OSI installed and configured):

```
You seem to have DECnet/OSI installed on this system. DECnet/OSI
includes a distributed time synchronization service (DECdts), which
does not currently support the DCE Distributed Time Service (DCE DTS)
functionality. The DCE DTS in this release provides full DECdts
functionality. This installation will stop DECdts and use DCE DTS
instead. For further clarification, please consult the Compaq DCE
for OpenVMS VAX and OpenVMS Alpha Product Guide.
```

Even though DCE DTS will be used, it is possible to accept time from DECdts servers.

```
Should this node accept time from DECdts servers? (YES/NO/?) [N]:
```

Answer Y to accept time from any DECnet/OSI DECdts server; however, time from this source is unauthenticated. If you answer N, this system accepts time only from DCE DTS servers.

```
Do you want this system to be a DTS Local Server (YES/NO/?) [N]:
```

If DECnet/OSI is not installed, this system must be configured as either a DTS clerk or a DTS server. For a complete description on the differences between DTS clerks and servers, please consult the section on how DTS works in the OSF DCE Administration Guide. Compaq recommends that you configure three DTS servers per cell.

After you respond, the procedure stops the CDS advertiser and asks you to perform a dce_login operation. After you log in, the procedure configures the system as a client system and asks for a clearinghouse name:

```
    Starting CDS Name Service Server daemon (DCE$CDSD) . . .
%RUN-S-PROC-ID, identification of created process is 238110C3
```

When configuring the CDS server, the procedure asks:

```
What is the name for this clearinghouse? [myhost_ch]:
```

Specify a name for this clearinghouse that is unique in this cell. The procedure displays the following messages and asks whether you want to replicate more directories.

```
          Initializing the name space for additional CDS server...
           Modifying acls on /.:/myhost_ch
           Modifying acls on /.:/hosts/myhost/cds-server
           Modifying acls on /.:/hosts/myhost/cds-gda
Do you wish to replicate more directories? (YES/NO/?):
```

The root directory from the CDS master server has just been replicated. You can replicate more directories if you want by answering Y. Next, you are prompted for the name of a CDS directory to be replicated.

```
Enter the name of a CDS directory to be replicated:
```

Enter the name of a CDS directory existing in the master CDS namespace that you want to replicate on this system. Type the directory name without the /.:/ prefix; it is added automatically. When you are finished, press only the RETURN key. The procedure displays the following messages and asks whether you want to run the CVP.

If your system is already configured as a CDS Replica Server, this option will show "Remove Replica CDS Server" on the Modify Configuration Menu.

Choose this option if you want to remove a CDS Replica Server from your DCE configuration. You will not affect the rest of your system's DCE configuration.

6.3 Adding a Security Replica

If you want to add a replica security server to your system, choose option 2 (Add Replica Security Server) from the Modify Configuration Menu. When you choose this option, the procedure will configure the system as a DCE client system if it is not already so configured.

Once the client configuration has neared completion, or if the system is currently a DCE client, the following messages will be displayed:

```
Configuring security replica server (DCE$SECD)
```

The procedure will prompt you to enter the security replica name.

```
Enter the security replica name (without subsys/dce/sec) [dcehost]:
```

After you enter your security replica name, you are prompted to enter a keyseed. Enter several random characters.

```
*********************************************************************
* Starting the security server requires that you supply             *
* a 'keyseed.' When asked for a 'keyseed,' type some                *
* random, alphanumeric keystrokes, followed by RETURN.              *
* (You won't be required to remember what you type.)                *
*********************************************************************

Enter keyseed for initial database master key:
```

The procedure continues, displaying information similar to the following, but dependent on your configuration:

```
Modifying acls on /.:/sec/replist...

Modifying acls on /.:/subsys/dce/sec...

Modifying acls on /.:/sec...

Modifying acls on /.:...

Modifying acls on /.:/cell-profile...

    Starting Security Service Server daemon (DCE$SECD) . . .

        Waiting for registry propagation...

Do you want to run the DCE Configuration Verification Program? (y/n/?) [y]:
```

If your system is already configured as a Security Replica Server, option in the Modify Configuration Menu shows "Remove Replica Security Server".

Choose option 2 if you want to remove a Security Replica from your DCE configuration. Its removal does not affect the rest of your system's DCE configuration.

When the procedure is completed, the Modify Configuration Menu is displayed again.

6.4 Adding/Removing a DTS Local Server

If you want to add a DTS server to your machine, you can do so on a system that has already been configured as a client, or on a system that has not yet been configured for DCE. Choose option 3 (Add DTS Local Server) from the Modify Configuration Menu.

If the system has not yet been configured for DCE, it will be configured as a DCE client.

Also choose option 3 if you want to modify your configuration from a DTS Local Server to a DTS clerk. This operation does not affect the rest of your system's DCE configuration.

6.5 Adding a DTS Global Server

If you want to add a DTS Global Server to your system, choose option 4 (Add DTS Global Server) from the Modify Configuration Menu.

If your system is already configured as a DTS Global Server, option 4 shows Change from DTS Global Server to DTS Clerk. Choose this option if you want to modify your configuration from a DTS Global Server to a DTS Clerk.

When the procedure is completed, the Modify Configuration Menu is displayed again.

6.6 Adding a Null Time Provider

The null time provider allows DTS to set the inaccuracy without setting the time or in any way modifying the host system time. Refer to the OSF DCE Administration Guide — Core Components volume for further information about getting time from Network Time Protocol (NTP) time sources.

If you want to add a null time provider to your system, choose option 5 (Add Null Time Provider) from the Modify Configuration Menu.

The configuration adds and starts the null time provider, displaying the following messages:

```
          Starting Null Time Provider (dts_null_provider)...

   Press <RETURN> to continue:
```

Press RETURN. When the procedure is completed, the Modify Configuration Menu is displayed again.

6.7 Adding an NTP Time Provider

If your site uses Network Time Protocol (NTP) to set system time, you can use those time signals to synchronize DTS. Briefly, one DTS server uses the NTP time provider software to synchronize with NTP. That DTS server synchronizes with other DTS servers using DTS time signals. Refer to the OSF DCE Administration Guide — Core Components volume for further information about getting time from NTP time sources.

If you want to add an NTP time provider to your system, choose option 6 (Add NTP Time Provider) from the Modify Configuration Menu.

The configuration adds and starts the null time provider, displaying the following messages:

```
      Starting NTP Time Provider (dts_ntp_provider)...

         Enter the hostname where the NTP server is running: dcedts.lkg.dec.com

   Press RETURN to continue:
```

Press RETURN. When the procedure is completed, the Modify Configuration Menu is displayed again.

6.8 Enabling Auditing

DCE auditing facilities detect and record critical events in distributed applications. To enable DCE auditing facilities on your machine, choose option 7 (Enable Auditing) from the Modify Configuration Menu.

The procedure begins configuring the Audit daemon and prompts you to log in to the cell.

```
            Starting Audit daemon (auditd).

    Please enter the principal name to be used [cell_admin]:
    Please enter the password for "cell_admin" (or ? for help):
```

After you log in, the procedure creates default filters and completes configuring the Audit daemon.

```
            Creating default filters for security, dts, and audit

        Successfully configured Audit daemon

    Press <RETURN> to continue:
```

If auditing was previously enabled on your system, option 7 displays as "Disable Auditing". Choose this option if you want to disable auditing on your system.

When the procedure is completed, the Modify Configuration Menu is displayed again.

6.9 Enabling DCE Integrated Login

If you want users to have the ability to obtain DCE credentials when they interactively log in to OpenVMS, and to automatically synchronize DCE and OpenVMS passwords, then choose option 8 from the Modify Configuration Menu. For more information on DCE Integrated Login, see the *Compaq DCE for OpenVMS VAX and OpenVMS Alpha Product Guide*.

If DCE Integrated Login was previously enabled on your system, option 8 displays as "Disable DCE Integrated Login". Choose this option if you want to disable DCE Integrated Login on your system.

When the procedure is completed, the Modify Configuration Menu is displayed again.

6.10 Enabling Kerberos 5

If you expect to need to interoperate with non-DCE Kerberos, choose option 9 from the Modify Configuration Menu. This option sets up the DCE Kerberos files so that they can be shared with non-DCE Kerberos implementations in order to facilitate better interoperability.

The following messages are displayed:

```
   Do you intend to run MIT Kerberos 5 services on this machine? (YES/NO/?) [N]:

        Configuring Kerberos.
```

When the procedure is completed, the Modify Configuration Menu is displayed again.

6.11 Configuring the LDAP Name Service

Note

You will need a working LDAP server somewhere on your network to configure DCE to use LDAP. Consult your LDAP documentation for information on terminology and setting up an LDAP server.

Configuring the LDAP name service involves three steps on the Modify Configuration Menu. Here, the first step defines to the system the extent of potential additional capabilities. If fully configured, LDAP provides a second path to access the X.500 directory service, requires less overhead than DAP, and provides support for the TCP/IP protocol.

Choose option 10 to add the LDAP name service to the configuration.

Next, to configure the LDAP name service, specify the location of the LDAP server and the distinguished name (DN) of your DCE cell as it appears in the LDAP name space.

You are prompted for necessary information in the following script. You can press '?' at the prompt for help.

```
Modify LDAP name service configuration

Please enter the hostname of the LDAP server [localhost]:
```

The LDAP server must be known to the network by a name.

```
Please enter the port number of the LDAP server [389]:
```

If no other port number is specified, press <RETURN> to specify the default value, port 389.

```
Please enter the authentication dn to the LDAP server []:
```

Enter the distinguished name associated with the LDAP server to authenticate the LDAP server to DCE.

```
Please enter the password of the authentication dn:
Type again to confirm:

Please enter the cell dn in LDAP syntax []:
```

Enter the distinguished name of the cell.

```
    Checking existing LDAP name service configuration
        Testing LDAP server access...
```

If you provide the wrong information, you see this message:

```
*** Error contacting the LDAP server
Please verify the LDAP configuration you provided is correct.

Press <RETURN> to continue:
```

When the procedure is completed, the Modify Configuration Menu is displayed again.

6.12 Adding LDAP Client Service

The LDAP Client Service option adds or removes host-specific information in the LDAP namespace; that is, to create server, group, and profile entries for LDAP like those entries that are used in CDS during the DCE client configuration. Examples of such entries include everything under /.:/hosts/HOST_NAME.

Choose option 11 to configure LDAP Client Service. When the procedure is completed, the Modify Configuration Menu is displayed again.

6.13 Configuring LDAP Support for the Global Directory Assistant

After enabling LDAP and adding LDAP Client Service, it is necessary to connect LDAP to the global directory agent (GDA). Cross-cell directory service is controlled by a GDA, which looks up foreign cell information on behalf of the application in either the Domain Naming Service (DNS) or X.500 database. Applications can request directory services from either CDS or LDAP or both. LDAP is provided as an optional directory service that is independent of CDS and duplicates CDS functionality.

Choose option 12 to configure communication between LDAP and the GDA.

To complete the configuration of the LDAP name service, you need to specify the location of the LDAP server, and the distinguished name of your DCE cell as it appears in the LDAP name space. You are prompted for necessary information in the following dialog. You can always press '?' at the prompt for help.

```
    Modify GDA LDAP configuration

    Please enter the hostname of the LDAP server [localhost]: cell

    Please enter the port number of the LDAP server [389]:

    Please enter the authentication dn to the LDAP server []:

    Please enter the authentication dn to the LDAP server []:

    Please enter the password of the authentication dn:
    Type again to confirm:

    Please enter the cell dn in LDAP syntax []:

        Re-starting Global Directory Agent daemon

    Starting Global Directory Agent daemon (gdad)...
%RUN-S-PROC-ID, identification of created process is 238110C8

    LDAP is successfully enabled for gdad
```

When the procedure is completed, the DCE Setup Main Menu is displayed again.

6.14 Registering a Cell in X.500

To search for destinations in other cells requires connection with a directory service database. All cross-cell directory name searches are controlled by the global directory agent (GDA), which looks up foreign cell information on behalf of an application in either the Domain Naming Service (DNS) or X.500 database.

Choose option 13 to set up communications between your configured cell and the X.500 directory service.

If you select the Register in X.500 option, you next see the X.500 menu. It requires you to specify an object class for your cell.

Enter the X.500 object class corresponding to your cell name. For example, if your cell name is /.../c=mycountry /o=mycompany/ou=mylocation, the object class is Organizational Unit.

```
 1) Organizational Unit
 2) Organization
 3) Organization Role
 4) Country
 5) Locality
 6) Application Entity
 7) Application Process
 8) Group of Names
 9) Device
10) Person
11) Return to Main Menu

Please enter the object class for cell :
```

Every entry in X.500 is classified according to the characteristics of the real world object that it represents. Before the cell entry can be created in the X.500 directory, you must specify the class of the entry.

For example, if you choose option 1, the organizational unit class is specified.

The superior entries must exist before the cell entry can be created. In the above example, c=mycountry/o=mycompany must exist prior to choosing the cell registration option.

If the cell entry exists, you are asked to confirm if the cell attribute information needs to be replaced.

COMPAQ cell registration, which is compatible with OSF DCE GDS, saves the cell information in special CDS-Cell and CDS-Replicas attributes.

If the cell registration fails, the following error is displayed:

```
*** Error: Unable to register cell information in X.500
```

Please refer to the dcesetup log file SYS$MANAGER:DCE$SETUP.LOG for more information.

If the procedure is completed successfully, the Modify Configuration Menu is displayeded again.

A

Files Created or Used on Your System

This appendix lists the directories and files that are created or used on your system by Compaq DCE for OpenVMS VAX and OpenVMS Alpha.

A.1 Installation Files

The following files are created when you install Compaq DCE for OpenVMS VAX or Compaq DCE for OpenVMS Alpha:

[1][SYSEXE]DCE$ADD_ID.EXE
[SYSHLP]DCE030.RELEASE_NOTES
[SYSUPD]DCE$COMPARE_VERSIONS.COM
[SYSUPD]DCE$GET_IMAGE_VERSION.COM

A.2 Run-Time Services Kit Files

The following files are created when you install the Compaq DCE Run-Time Services Kit:

Startup/Configuration files

[SYS$STARTUP]DCE$STARTUP.COM
[SYS$STARTUP]DCE$SHUTDOWN.COM

[SYSHLP]DCEDCL.HLP

[SYSMGR]DCE$DEFINE_REQUIRED_COMMANDS.COM
[1][SYSMGR]DCE$RPC_SHUTDOWN.COM
[1][SYSMGR]DCE$RPC_STARTUP.COM
[SYSMGR]DCE$SETUP.COM
[SYSMGR]DCE$SETUP_MULTINET.COM
[SYSMGR]DCE$SETUP_NONE.COM
[SYSMGR]DCE$SETUP_PATHWAY.COM
[SYSMGR]DCE$SETUP_TCPWARE.COM
[SYSMGR]DCE$SETUP_UCX.COM

[SYSEXE]DCE$SEC_SETUP.EXE
[SYSEXE]DCE$GETCELLS.EXE
[SYSEXE]DCE$GETCELLINFO.EXE
[SYSEXE]DCE$KCFG.EXE

Data files

[DCELOCAL.VAR.SVC]ROUTING.;
[DCELOCAL.ETC]CODE_SET_REGISTRY.TXT
[DCELOCAL.ETC]CDS_ATTRIBUTES.DAT
[DCELOCAL.ETC]CDS_GLOBALNAMES.;
[DCELOCAL.ETC]CDSCP.BPT
[DCELOCAL.ETC]DTSCP.BPT
[DECW$DEFAULTS.USER]DC$CDSBROWSER.UID
[SYSUPD]DTSS$INSTALL_TIMEZONE_RULE.COM

---

[1] These files are installed by OpenVMS or by DCE if the OpenVMS version is prior to version 7.2-1.

Files Created or Used on Your System
A.2 Run-Time Services Kit Files

Tools

```
[DCELOCAL.DCECP]ATTRLIST.DCP
[DCELOCAL.DCECP]ATTR_EVAL.TCL
[DCELOCAL.DCECP]BCKP_CDS.DCP
[DCELOCAL.DCECP]BCKP_SEC.DCP
[DCELOCAL.DCECP]CELL.DCP
[DCELOCAL.DCECP]CELLALIAS.DCP
[DCELOCAL.DCECP]CP.COM
[DCELOCAL.DCECP]DIR_OPS.DCECP
[DCELOCAL.DCECP]DTS.DCP
[DCELOCAL.DCECP]GETIP.COM
[DCELOCAL.DCECP]GETSYI.COM
[DCELOCAL.DCECP]GREP.COM
[DCELOCAL.DCECP]HELP.DCP
[DCELOCAL.DCECP]HOST.DCP
[DCELOCAL.DCECP]HOSTVAR.DCP
[DCELOCAL.DCECP]INIT.DCECP
[DCELOCAL.DCECP]LS.COM
[DCELOCAL.DCECP]PARSEARGS.DCP
[DCELOCAL.DCECP]REGISTRY.DCP
[DCELOCAL.DCECP]RM.COM
[DCELOCAL.DCECP]TAR.COM
[DCELOCAL.DCECP]TCLINDEX.;
[DCELOCAL.DCECP]USER.DCP
[DCELOCAL.DCECP]UNAME.COM
[DCELOCAL.DCECP]UTILITY.DCP
[DCELOCAL.DCECP]VERB-OBJECT.DCP

[DCELOCAL.TCL]INIT.TCL
[DCELOCAL.TCL]PARRAY.TCL
[DCELOCAL.TCL]TCLINDEX.;

[SYSHLP.EXAMPLES.DCE.TOOLS]JPI.COM
```

Executable/Library files

```
1[SYSLIB]DCE$LIB_SHR.EXE
1[SYSLIB]DCE$KERNEL.EXE
1[SYSLIB]DCE$SOCKSHR_IP.EXE
1[SYSLIB]DCE$SHCKSHR_DNET_IV.EXE
1[SYSLIB]DCE$SOCKSHR_DNET_OSI.EXE
1[SYSLIB]DCE$SOCKSHR_TPS.EXE
1[SYSLIB]DTSS$SHR.EXE
[SYSLIB]DCE$NSEDIT_SHR.EXE
[SYSLIB]DXD$CDS_SHR.EXE
[SYSLIB]DCE$UAF_SHR.EXE
[SYSLIB]DCE$LGI_CALLOUTS.EXE
1[SYSLIB]DTSS$RUNDOWN.EXE

[SYSLHP.EXAMPLES.DCE.X500]DXD$XDS_SHR.EXE

[SYSUPD]DCE$UAF_CONVERT.EXE
```

[SYSEXE]DCE$UUIDGEN.EXE
[SYSEXE]DCE$TCL.EXE
[2][SYSEXE]ZIC.EXE
[1][SYSEXE]RPCCP.EXE
[1][SYSEXE]DCE$DCED.EXE
[1][SYSEXE]DCE$RPCPERF_CLIENT.EXE
[1][SYSEXE]DCE$RPCPERF_SERVER.EXE
[SYSEXE]DCE$NSID.EXE
[SYSEXE]DCE$DCESX.EXE
[SYSEXE]DCE$NSEDIT.EXE
[SYSEXE]DCE$CADUMP.EXE
[SYSEXE]DCE$CDSADVER.EXE
[SYSEXE]DCE$CDSCLERK.EXE
[SYSEXE]DCE$CDSCP.EXE
[SYSEXE]DCE$CDSBROWSER.EXE
[3][SYSEXE]DCE$CDSD.EXE
[3][SYSEXE]DCE$CDSD_DBDUMP.EXE
[3][SYSEXE]DCE$CDSD_DIAG.EXE
[3][SYSEXE]DCE$GDAD.EXE
[SYSEXE]DCE$X500_ADDCELL.EXE
[SYSEXE]DCE$LDAPSEARCH.EXE
[SYSEXE]DCE$LDAPMODIFY.EXE
[SYSEXE]DCE$LDAPDELETE.EXE
[SYSEXE]DCE$LDAPMODRDN.EXE
[SYSEXE]DCE$RGY_EDIT.EXE
[SYSEXE]DCE$ACL_EDIT.EXE
[SYSEXE]DCE$DCE_LOGIN.EXE
[3][SYSEXE]DCE$SEC_ADMIN.EXE
[3][SYSEXE]DCE$SECD.EXE
[3][SYSEXE]DCE$SEC_CREATE_DB.EXE
[SYSEXE]DCE$KDESTROY.EXE
[SYSEXE]DCE$KINIT.EXE
[SYSEXE]DCE$KLIST.EXE
[SYSEXE]DCE$CHPASS.EXE
[SYSEXE]DCE$UAF.EXE
[SYSEXE]DCE$IMPORT.EXE
[SYSEXE]DCE$EXPORT.EXE
[1][SYSEXE]DTSS$SET_TIMEZONE.EXE
[SYSEXE]DCE$DTSCP.EXE
[SYSEXE]DCE$DTSD.EXE
[SYSEXE]DTSS$GRAPH.EXE
[SYSEXE]DCE$AUDITD.EXE

Message/Help files

[SYSMSG]DCE$UUIDGEN_MSG.EXE
[SYSMSG]DCE$IL_MSG.EXE

[SYSEXE]DCE$SAMS.EXE

[SYSHLP]DCE$CDSBROWSER.HLB
[SYSHLP]DCE$UAF_HELP.HLB
[SYSHLP]DCE$IMPORT_HELP.HLB
[SYSHLP]DCE$EXPORT_HELP.HLB
[SYSHLP]DCE$DTSCP.HLB

---

[2] These files are installed by DCE with OpenVMS Version 6.2

[3] These files are installed with the Runtime, but controlled by separate license PAKs (DCE-CDS or DCE-SECURITY).

A.3 Application Developer's Kit Files

When you install the Application Developer's Kit, all the files in the Runtime Services Kit are created. In addition, the following files are created:

```
[SYSEXE]DCE$IDL.EXE
[SYSEXE]DCE$RPCLM.EXE

[SYSMSG]DCE$IDL_MSG.EXE

[SYSLIB]DCE$MSRPC_MAPPING_SHR.EXE
[SYSLIB]DCE$IL_DEF.H
[SYSLIB]DCE$IL_MSG.H
[SYSLIB]DCE$IDL_CXX_SHR.EXE
[SYSLIB]LSEUPDATE_ENV.TPU
[SYSLIB]IDL.ENV
[SYSLIB]IDL.CLD
[SYSLIB]UUID.CLD
[SYSLIB]RPCLM.CLD
[SYSLIB]XDS.H
[SYSLIB]XDSBDCP.H
[SYSLIB]XDSCDS.H
[SYSLIB]XDSGDS.H
[SYSLIB]XDSMDUP.H
[SYSLIB]XDSSAP.H
[SYSLIB]XMHP.H
[SYSLIB]XOM.H
[SYSLIB]XOMI.H

[DCE$LIBRARY]DCE$DEFINE_OPTIONAL_COMMANDS.COM
[DCE$LIBRARY]MSRPC_MAPPING.H
[DCE$LIBRARY]DCE.OPT
[DCE$LIBRARY]DCE_CXX.OPT
[DCE$LIBRARY]ACCT.H
[DCE$LIBRARY]ACCT.IDL
[DCE$LIBRARY]ACLBASE.H
[DCE$LIBRARY]ACLBASE.IDL
[DCE$LIBRARY]ACLIF.H
[DCE$LIBRARY]ASSERT.H
[DCE$LIBRARY]AUDIT.H
[DCE$LIBRARY]AUDIT_CONTROL.H
[DCE$LIBRARY]AUDIT_CONTROL.IDL
[DCE$LIBRARY]AUDIT_LOG.H
[DCE$LIBRARY]BINDING.H
[DCE$LIBRARY]BINDING.IDL
[DCE$LIBRARY]CDSCLERK.H
[DCE$LIBRARY]CODESETS.H
[DCE$LIBRARY]CODESETS.IDL
[DCE$LIBRARY]CODESETS_STUB.H
[DCE$LIBRARY]CONV.H
[DCE$LIBRARY]CONV.IDL
[DCE$LIBRARY]CONVC.H
[DCE$LIBRARY]CONVC.IDL
[DCE$LIBRARY]DACLIF.H
[DCE$LIBRARY]DACLIF.IDL
[DCE$LIBRARY]DACLMGR.H
[DCE$LIBRARY]DACLMGR.IDL
[DCE$LIBRARY]DACLMGRV0.H
[DCE$LIBRARY]DACLMGRV0.IDL
[DCE$LIBRARY]DATABASE.H
[DCE$LIBRARY]DATABASE.IDL
[DCE$LIBRARY]DBIF.H
[DCE$LIBRARY]DCE.H
[DCE$LIBRARY]DCE64.H
[DCE$LIBRARY]DCE_ATTR_BASE.H
[DCE$LIBRARY]DCE_ATTR_BASE.IDL
```

```
[DCE$LIBRARY]DCE_ATTR_SCH.H
[DCE$LIBRARY]DCE_ATTR_SCH.IDL
[DCE$LIBRARY]DCE_CF.H
[DCE$LIBRARY]DCE_CF_CONST.H
[DCE$LIBRARY]DCE_CF_CONST.IDL
[DCE$LIBRARY]DCE_ERROR.H
[DCE$LIBRARY]DCE_MSG.H
[DCE$LIBRARY]DCE_SVC.H
[DCE$LIBRARY]DCE_UTILS.H
[DCE$LIBRARY]DCEACL.H
[DCE$LIBRARY]DCEACL.IDL
[DCE$LIBRARY]DCEAUDMSG.H
[DCE$LIBRARY]DCECDSMAC.H
[DCE$LIBRARY]DCECDSMSG.H
[DCE$LIBRARY]DCECDSSVC.H
[DCE$LIBRARY]DCECFGMSG.H
[DCE$LIBRARY]DCED.H
[DCE$LIBRARY]DCED_ACLBITS.H
[DCE$LIBRARY]DCED_ACLBITS.IDL
[DCE$LIBRARY]DCED_BASE.H
[DCE$LIBRARY]DCED_BASE.IDL
[DCE$LIBRARY]DCED_DATA.H
[DCE$LIBRARY]DCEDHDMSG.H
[DCE$LIBRARY]DCEDTSMSG.H
[DCE$LIBRARY]DCEGSSMSG.H
[DCE$LIBRARY]DCELIBMSG.H
[DCE$LIBRARY]DCESVCMSG.H
[DCE$LIBRARY]DNSCLERK.H
[DCE$LIBRARY]DNSMESSAGE.H
[DCE$LIBRARY]DNSMESSAGE.IDL
[DCE$LIBRARY]DTSPROVIDER.ACF
[DCE$LIBRARY]DTSPROVIDER.H
[DCE$LIBRARY]DTSPROVIDER.IDL
[DCE$LIBRARY]EP.H
[DCE$LIBRARY]EP.IDL
[DCE$LIBRARY]GSSAPI.H
[DCE$LIBRARY]HASHTAB.HXX
[DCE$LIBRARY]ID_BASE.H
[DCE$LIBRARY]ID_BASE.IDL
[DCE$LIBRARY]ID_ENCODE.H
[DCE$LIBRARY]ID_ENCODE.IDL
[DCE$LIBRARY]ID_EPAC.H
[DCE$LIBRARY]ID_EPAC.IDL
[DCE$LIBRARY]IDL_ES.H
[DCE$LIBRARY]IDLBASE.H
[DCE$LIBRARY]IDLDDEFS.H
[DCE$LIBRARY]IOVECTOR.H
[DCE$LIBRARY]IFACEMGR.HXX
[DCE$LIBRARY]KDB5_ERR.H
[DCE$LIBRARY]KDC5_ERR.H
[DCE$LIBRARY]KRB5_ERR.H
[DCE$LIBRARY]KEYMGMT.H
[DCE$LIBRARY]KEYMGMT.IDL
[DCE$LIBRARY]LBASE.H
[DCE$LIBRARY]LBASE.IDL
[DCE$LIBRARY]MARSHALL.H
[DCE$LIBRARY]MGMT.H
[DCE$LIBRARY]MGMT.IDL
[DCE$LIBRARY]MISC.H
[DCE$LIBRARY]MISC.IDL
[DCE$LIBRARY]NBASE.FOR
[DCE$LIBRARY]NBASE.FOR_H
[DCE$LIBRARY]NBASE.H
[DCE$LIBRARY]NBASE.ACF
[DCE$LIBRARY]NBASE.IDL
```

```
[DCE$LIBRARY]NCASTAT.H
[DCE$LIBRARY]NCASTAT.IDL
[DCE$LIBRARY]NDR_REP.H
[DCE$LIBRARY]NDROLD.H
[DCE$LIBRARY]NDROLD.IDL
[DCE$LIBRARY]NDRTYPES.H
[DCE$LIBRARY]OBJREF.HXX
[DCE$LIBRARY]OBJTABLE.HXX
[DCE$LIBRARY]ORIDE_BASE.H
[DCE$LIBRARY]ORIDE_BASE.IDL
[DCE$LIBRARY]OVERRIDE.H
[DCE$LIBRARY]OVERRIDE.IDL
[DCE$LIBRARY]PASSWD.H
[DCE$LIBRARY]PASSWD.IDL
[DCE$LIBRARY]PASSWD_ENCODE.H
[DCE$LIBRARY]PASSWD_ENCODE.IDL
[DCE$LIBRARY]PGO.H
[DCE$LIBRARY]PGO.IDL
[DCE$LIBRARY]PKL.H
[DCE$LIBRARY]PKL.IDL
[DCE$LIBRARY]PKLBASE.H
[DCE$LIBRARY]PKLBASE.IDL
[DCE$LIBRARY]POLICY.H
[DCE$LIBRARY]POLICY.IDL
[DCE$LIBRARY]PRIV_ATTR_TRIG.H
[DCE$LIBRARY]PRIV_ATTR_TRIG.IDL
[DCE$LIBRARY]PROXYMGR.HXX
[DCE$LIBRARY]PVTUTL.H
[DCE$LIBRARY]PVTUTL.IDL
[DCE$LIBRARY]RDACLBASE.H
[DCE$LIBRARY]RDACLBASE.IDL
[DCE$LIBRARY]RDACLIF.H
[DCE$LIBRARY]RDACLIF.IDL
[DCE$LIBRARY]RDACLIFV0.H
[DCE$LIBRARY]RDACLIFV0.IDL
[DCE$LIBRARY]RECLAIM.H
[DCE$LIBRARY]REPADM.H
[DCE$LIBRARY[REPADM.IDL
[DCE$LIBRARY]REPLIST.H
[DCE$LIBRARY]REPLIST.IDL
[DCE$LIBRARY]RGYBASE.H
[DCE$LIBRARY]RGYBASE.IDL
[DCE$LIBRARY]RGYNBASE.H
[DCE$LIBRARY]RGYNBASE.IDL
[DCE$LIBRARY]RPC.H
[DCE$LIBRARY]RPC.IDL
[DCE$LIBRARY]RPCBASE.H
[DCE$LIBRARY]RPCBASE.IDL
[DCE$LIBRARY]RPCEXC.H
[DCE$LIBRARY]RPCPVT.H
[DCE$LIBRARY]RPVPVT.IDL
[DCE$LIBRARY]RPCSTS.H
[DCE$LIBRARY]RPCSTS.IDL
[DCE$LIBRARY]RPCTYPES.H
[DCE$LIBRARY]RPCTYPES.IDL
[DCE$LIBRARY]RPLADMN.H
[DCE$LIBRARY[RPLADMN.IDL
[DCE$LIBRARY]RPLBASE.H
[DCE$LIBRARY]RPLBASE.IDL
[DCE$LIBRARY]RPRIV_1_0.H
[DCE$LIBRARY[RPRIV_1_0.IDL
[DCE$LIBRARY]RRPC.H
[DCE$LIBRARY]RRPC.IDL
[DCE$LIBRARY]RS_BIND.H
[DCE$LIBRARY]RS_BIND.IDL
```

```
[DCE$LIBRARY]RS_LOGIN_ACTIVITY.H
[DCE$LIBRARY]RS_LOGIN_ACTIVITY.IDL
[DCE$LIBRARY]RS_LOGIN_BASE.H
[DCE$LIBRARY]RS_LOGIN_BASE.IDL
[DCE$LIBRARY]RS_PWD_MGMT.H
[DCE$LIBRARY]RS_PWD_MGMT.IDL
[DCE$LIBRARY]RSEC_LOGIN.H
[DCE$LIBRARY]RSEC_LOGIN.IDL
[DCE$LIBRARY]RSEC_PK_CACHE.H
[DCE$LIBRARY]RSEC_PK_CACHE.IDL
[DCE$LIBRARY]RSEC_PWD_MGMT.H
[DCE$LIBRARY]RSEC_PWD_MGMT.IDL
[DCE$LIBRARY]RUTC.ACF
[DCE$LIBRARY]RUTC.H
[DCE$LIBRARY]RUTC.IDL
[DCE$LIBRARY]SEC_ACL_ENCODE.H
[DCE$LIBRARY]SEC_ACL_ENCODE.IDL
[DCE$LIBRARY]SEC_ATTR_BASE.H
[DCE$LIBRARY]SEC_ATTR_BASE.IDL
[DCE$LIBRARY]SEC_ATTR_TOOLS.H
[DCE$LIBRARY]SEC_ATTR_TRIG.H
[DCE$LIBRARY]SEC_ATTR_TRIG.IDL
[DCE$LIBRARY]SEC_ATTR_UTIL.H
[DCE$LIBRARY]SEC_ATTR_UTIL.IDL
[DCE$LIBRARY]SEC_AUTHN.H
[DCE$LIBRARY]SEC_AUTHN.IDL
[DCE$LIBRARY]SEC_BASE.H
[DCE$LIBRARY]SEC_BASE.IDL
[DCE$LIBRARY]SEC_CERT.H
[DCE$LIBRARY]SEC_CERT.IDL
[DCE$LIBRARY]SEC_CRED.H
[DCE$LIBRARY]SEC_CRED.IDL
[DCE$LIBRARY]SEC_LOGIN.H
[DCE$LIBRARY]SEC_LOGIN.IDL
[DCE$LIBRARY]SEC_LOGIN_BASE.H
[DCE$LIBRARY]SEC_LOGIN_BASE.IDL
[DCE$LIBRARY]SEC_PK_BASE.H
[DCE$LIBRARY]SEC_PK_BASE.IDL
[DCE$LIBRARY]SEC_PSM.H
[DCE$LIBRARY]SEC_PSM.IDL
[DCE$LIBRARY]SEC_PUBKEY.H
[DCE$LIBRARY]SEC_PUBKEY.IDL
[DCE$LIBRARY]SEC_PVTKEY.H
[DCE$LIBRARY]SEC_PVTKEY.IDL
[DCE$LIBRARY]SEC_PWD_MGMT.H
[DCE$LIBRARY]SEC_PWD_MGMT.IDL
[DCE$LIBRARY]SEC_RGY_ATTR.H
[DCE$LIBRARY]SEC_RGY_ATTR.IDL
[DCE$LIBRARY]SEC_RGY_ATTR_SCH.H
[DCE$LIBRARY]SEC_RGY_ATTR_SCH.IDL
[DCE$LIBRARY]SEC_RGY_ATTR_SRCH.H
[DCE$LIBRARY]SEC_RGY_ATTR_SRCH.IDL
[DCE$LIBRARY]SEC_RGY_LOGIN_ACTIVITY.H
[DCE$LIBRARY]SEC_RGY_LOGIN_ACTIVITY.IDL
[DCE$LIBRARY]SECIDMAP.H
[DCE$LIBRARY]SECIDMAP.IDL
[DCE$LIBRARY]SECSTS.H
[DCE$LIBRARY]SECSTS.IDL
[DCE$LIBRARY]SERVICE.H
[DCE$LIBRARY]SERVICE.IDL
[DCE$LIBRARY]STUBBASE.H
[DCE$LIBRARY]SVCBIN.H
[DCE$LIBRARY]SVCBIN.IDL
[DCE$LIBRARY]SVCFILTER.H
[DCE$LIBRARY]SVCLOG.H
```

```
[DCE$LIBRARY]SVCREMOTE.H
[DCE$LIBRARY]TRACE.HXX
[DCE$LIBRARY]TWR.H
[DCE$LIBRARY]TWR.IDL
[DCE$LIBRARY]UNIX.H
[DCE$LIBRARY]UNIX.IDL
[DCE$LIBRARY]UTC.H
[DCE$LIBRARY]UTCTYPES.H
[DCE$LIBRARY]UTCTYPES.IDL
[DCE$LIBRARY]UUID.H
[DCE$LIBRARY]UUID.IDL
```

A.4 Example Application Files

The following example application files are created when you install the Application Developer's Kit:

```
[SYSHLP.EXAMPLES.DCE.GSSAPI]ECHO.COM
[SYSHLP.EXAMPLES.DCE.GSSAPI]DCE.OPT
[SYSHLP.EXAMPLES.DCE.GSSAPI]ECHO.README
[SYSHLP.EXAMPLES.DCE.GSSAPI]ECHO_CLIENT.C
[SYSHLP.EXAMPLES.DCE.GSSAPI]ECHO_INET.H
[SYSHLP.EXAMPLES.DCE.GSSAPI]ECHO_SERVER.C
[SYSHLP.EXAMPLES.DCE.GSSAPI]ECHO_UTILS.C
[SYSHLP.EXAMPLES.DCE.GSSAPI]ECHO_UTILS.H

[SYSHLP.EXAMPLES.DCE.PWD_MGMT]PWD_MGMT.COM
[SYSHLP.EXAMPLES.DCE.PWD_MGMT]DCE.OPT
[SYSHLP.EXAMPLES.DCE.PWD_MGMT]PWD_MGMT.README
[SYSHLP.EXAMPLES.DCE.PWD_MGMT]GEN.C
[SYSHLP.EXAMPLES.DCE.PWD_MGMT]GEN.H
[SYSHLP.EXAMPLES.DCE.PWD_MGMT]PWD_CACHE.C
[SYSHLP.EXAMPLES.DCE.PWD_MGMT]PWD_CACHE.H
[SYSHLP.EXAMPLES.DCE.PWD_MGMT]PWD_STRENGTHD.C
[SYSHLP.EXAMPLES.DCE.PWD_MGMT]RSEC_PWD_MGMT.IDL
[SYSHLP.EXAMPLES.DCE.PWD_MGMT]SECVMS.H

[SYSHLP.EXAMPLES.DCE.RPC.BOOK]BOOK.COM
[SYSHLP.EXAMPLES.DCE.RPC.BOOK]DCE.OPT
[SYSHLP.EXAMPLES.DCE.RPC.BOOK]BOOK.README
[SYSHLP.EXAMPLES.DCE.RPC.BOOK]BOOK.ACF
[SYSHLP.EXAMPLES.DCE.RPC.BOOK]BOOK.C
[SYSHLP.EXAMPLES.DCE.RPC.BOOK]BOOK.IDL
[SYSHLP.EXAMPLES.DCE.RPC.BOOK]BOOK_MAIN.C
[SYSHLP.EXAMPLES.DCE.RPC.BOOK]BOOK_MGR.C
[SYSHLP.EXAMPLES.DCE.RPC.BOOK]RPCSERVER.C
[SYSHLP.EXAMPLES.DCE.RPC.BOOK]RPCSERVER.H

[SYSHLP.EXAMPLES.DCE.RPC.CONTEXT_APP]CONTEXT_APP.COM
[SYSHLP.EXAMPLES.DCE.RPC.CONTEXT_APP]DCE.OPT
[SYSHLP.EXAMPLES.DCE.RPC.CONTEXT_APP]CONTEXT_APP.README
[SYSHLP.EXAMPLES.DCE.RPC.CONTEXT_APP]CONTEXT.ACF
[SYSHLP.EXAMPLES.DCE.RPC.CONTEXT_APP]CONTEXT.IDL
[SYSHLP.EXAMPLES.DCE.RPC.CONTEXT_APP]CONTEXT_CLIENT.C
[SYSHLP.EXAMPLES.DCE.RPC.CONTEXT_APP]CONTEXT_MANAGER.C
[SYSHLP.EXAMPLES.DCE.RPC.CONTEXT_APP]CONTEXT_SERVER.C
```

```
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]DATA_TEST_APP.COM
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]DCE.OPT
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]DATA_TEST_APP.README
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]TEST_FILE.;
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]DATA_TEST.ACF
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]DATA_TEST.IDL
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]DATA_TEST_CLIENT.C
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]DATA_TEST_MANAGER.C
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]DATA_TEST_SERVER.C
[SYSHLP.EXAMPLES.DCE.RPC.DATA_TEST_APP]DATA_TEST_XMIT.C

[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX]IDLCXX.README
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]ACCOUNT.COM
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]IDLCXX.OPT
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]ACCOUNT.README
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]ACCOUNT.ACF
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]ACCOUNT.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]CHECKING.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]CLIENT.CXX
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]COMMON.H
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]NOWACCOUNT.H
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]SAVINGS.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]SERVER.CXX
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNT]SVRLIB.CXX

[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]ACCOUNTC.COM
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]IDLCXX.OPT
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]ACCOUNTC.README
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]ACCOUNT.ACF
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]ACCOUNT.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]CHECKING.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]CLIENT.C
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]COMMON.H
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]NOWACCOUNT.H
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]SAVINGS.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]SERVER.CXX
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.ACCOUNTC]SVRLIB.CXX

[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]CARD.COM
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]IDLCXX.OPT
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]CARD.README
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]CARD.ACF
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]CARD.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]CARDIMPL.CXX
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]CLIENT.CXX
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]COMMON.H
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]IPLAYER.ACF
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]IPLAYER.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]PLAYER.CXX
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]PLAYER.H
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]SERVER.CXX
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.CARD]UTIL.CXX

[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]STACK.COM
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]IDLCXX.OPT
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]STACK.README
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]CALCULATOR.H
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]CLIENT.CXX
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]COMMON.H
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]ICALCULATE.ACF
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]ICALCULATE.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]ISTACK.ACF
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]ISTACK.IDL
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]SERVER.CXX
[SYSHLP.EXAMPLES.DCE.RPC.IDLCXX.STACK]STACK.H
```

```
[SYSHLP.EXAMPLES.DCE.RPC.PAYROLL]PAYROLL.COM
[SYSHLP.EXAMPLES.DCE.RPC.PAYROLL]DCE.OPT
[SYSHLP.EXAMPLES.DCE.RPC.PAYROLL]PAYROLL.README
[SYSHLP.EXAMPLES.DCE.RPC.PAYROLL]MANAGER.FOR
[SYSHLP.EXAMPLES.DCE.RPC.PAYROLL]PAYROLL.DAT
[SYSHLP.EXAMPLES.DCE.RPC.PAYROLL]PAYROLL.IDL
[SYSHLP.EXAMPLES.DCE.RPC.PAYROLL]PRINT_PAY.FOR
[SYSHLP.EXAMPLES.DCE.RPC.PAYROLL]SERVER.C

[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]PHNBK.COM
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]DCE.OPT
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]PHNBK.README
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]CLIENT.C
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]DOSPORT.H
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]MANAGER.C
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]PHNBK.ACF
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]PHNBK.DOS
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]PHNBK.IDL
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]PHNBK.NT
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]PHNBK.TXT
[SYSHLP.EXAMPLES.DCE.RPC.PHONEBOOK]SERVER.C

[SYSHLP.EXAMPLES.DCE.RPC.TEST1]TEST1.COM
[SYSHLP.EXAMPLES.DCE.RPC.TEST1]DCE.OPT
[SYSHLP.EXAMPLES.DCE.RPC.TEST1]TEST1.README
[SYSHLP.EXAMPLES.DCE.RPC.TEST1]TEST1.C
[SYSHLP.EXAMPLES.DCE.RPC.TEST1]TEST1.IDL
[SYSHLP.EXAMPLES.DCE.RPC.TEST1]TEST1_MAIN.C
[SYSHLP.EXAMPLES.DCE.RPC.TEST1]TEST1_MGR.C

[SYSHLP.EXAMPLES.DCE.RPC.TEST2]TEST2.COM
[SYSHLP.EXAMPLES.DCE.RPC.TEST2]DCE.OPT
[SYSHLP.EXAMPLES.DCE.RPC.TEST2]TEST2.README
[SYSHLP.EXAMPLES.DCE.RPC.TEST2]TEST2.C
[SYSHLP.EXAMPLES.DCE.RPC.TEST2]TEST2.IDL
[SYSHLP.EXAMPLES.DCE.RPC.TEST2]TEST2_MAIN.C
[SYSHLP.EXAMPLES.DCE.RPC.TEST2]TEST2_MGR.C

[SYSHLP.EXAMPLES.DCE.RPC.TEST3]TEST3.COM
[SYSHLP.EXAMPLES.DCE.RPC.TEST3]DCE.OPT
[SYSHLP.EXAMPLES.DCE.RPC.TEST3]TEST3.README
[SYSHLP.EXAMPLES.DCE.RPC.TEST3]TEST3.C
[SYSHLP.EXAMPLES.DCE.RPC.TEST3]TEST3.IDL
[SYSHLP.EXAMPLES.DCE.RPC.TEST3]TEST3_MAIN.C
[SYSHLP.EXAMPLES.DCE.RPC.TEST3]TEST3_MGR.C

[SYSHLP.EXAMPLES.DCE.SVC.HELLO_SVC]HELLO_SVC.COM
[SYSHLP.EXAMPLES.DCE.SVC.HELLO_SVC]DCE.OPT
[SYSHLP.EXAMPLES.DCE.SVC.HELLO_SVC]HELLO_SVC.README
[SYSHLP.EXAMPLES.DCE.SVC.HELLO_SVC]HEL.SAMS
[SYSHLP.EXAMPLES.DCE.SVC.HELLO_SVC]HEL_SVC.H
[SYSHLP.EXAMPLES.DCE.SVC.HELLO_SVC]HELLO_SVC.C
```

B

Sample Installation Logs

This appendix provides a listing for the installation of Compaq DCE for OpenVMS Version 3.0 on OpenVMS Alpha.

B.1 Installing Compaq DCE on OpenVMS Alpha

This installation has the following assumptions:

- OpenVMS Alpha Version 6.2 or higher was installed.
- Both the Runtime Services Kit (RTK) and the Application Developer's Kit (ADK) are being installed.
- The ADK license PAK was loaded already.
- Either UCX Version 4.2 or TCP/IP Services for OpenVMS Version 5.0 (or higher), and DECnet Phase IV or DECnet Phase V were installed.
- The DCE$SERVER account exists already.
- The NET$DECLAREOBJECT right has not yet been granted to DCE$SERVER; it will be granted by the installation procedure.

```
$ @dka500:[dceaxp030]dce$install help

        Performing DCE pre-installation tasks...please wait.

    This installation procedure has detected an existing DCE$SERVER
    account. Correct operation of DCE on this system requires that the
    DCE$SERVER account have TMPMBX, NETMBX, DETACH, and SYSPRV privileges.

    The installation procedure will modify the DCE$SERVER account to ensure
    that the prerequisite privileges are present.

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

The following product has been selected:
    DEC AXPVMS DCE V3.0                    Layered Product [Installed]

Do you want to continue? [YES]

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 DCE V3.0: DCE V3.0 for OpenVMS Alpha


Greetings!

This is DCE V3.0 for OpenVMS Alpha.
There are four components: the DCE Runtime Services, the
DCE Application Development Kit, the DCE Security Server,
and the DCE CDS Server.

     1. The Runtime Services provides the core services necessary to
        execute and manage DCE applications.
```

```
     2. The Application Development Kit provides the services and tools
        required to develop, execute, and manage DCE applications.
        The Runtime Services capability is automatically provided
        with the Application Development Kit.

     3. The security server supplies support for a cell wide security
        database. A cell must have at least one system running a security
        server.

     4. The CDS server supplies support for a cell wide naming database.
        A cell must have at least one system running a CDS server.

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    DFARS  252.227-7013, or in FAR 52.227-19, or in FAR 52.227-14 Alt. III,
    as applicable.

    Compaq Computer Corporation

    The software product is sold by Compaq Computer Corporation.

    This product uses the following PAKS: DCE-SECURITY, DCE-CDS, DCE-APP-DEV

    This product currently has 3 Product Authorization Keys:

        Producer      PAK Name        Version      Release Date

        DEC           DCE-SECURITY    V3.0         01-JUL-2000
        DEC           DCE-CDS         V3.0         01-JUL-2000
        DEC           DCE-APP-DEV     V3.0         01-JUL-2000

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

    The Application Development Kit is optional and enabled with a PAK.
    It provides the services and tools required to develop, execute, and
    manage DCE applications.

      The Application Development Kit installs:

      + Required DCE application development header files
      + Interface Definition Language Compiler (IDL)
      + Language-Sensitive Editor (LSE) Templates for the Interface
         Definition Language
      + Unique User Identifier (UUID) Generator
      + Sample DCE Applications

    The Application Development Kit [NO] y

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

DEC AXPVMS DCE V3.0: DCE V3.0 for OpenVMS Alpha [Installed]
    The Application Development Kit: YES

Are you satisfied with these options? [YES]

Execution phase starting ...

The following product will be installed to destination:
    DEC AXPVMS DCE V3.0                   DISK$PCL090_SYS:[VMS$COMMON.]

Portion done: 0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
```

```
The following product has been installed:
    DEC AXPVMS DCE V3.0                    Layered Product

*** DCE Product installation successful...beginning post-installation.


    The rights identifier NET$DECLAREOBJECT will now be granted to the
    DCE$SERVER account. You may IGNORE the message:

"%UAF-E-GRANTERR, unable to grant identifier NET$DECLAREOBJECT to DCE$SERVER
-SYSTEM-F-DUPIDENT, duplicate identifier"

    if it should occur.

Press return to Continue
%UAF-E-GRANTERR, unable to grant identifier NET$DECLAREOBJECT to DCE$SERVER
-SYSTEM-F-DUPIDENT, duplicate identifier

Load the Language-Sensitive Editor (LSE) templates for IDL? [Y]: n

    NOTE: Please add the following to your system's SYS$MANAGER:SYLOGIN.COM.
          These files define foreign commands for using DCE on OpenVMS.

          $ @SYS$MANAGER:DCE$DEFINE_REQUIRED_COMMANDS.COM
          $ @SYS$COMMON:[DCE$LIBRARY]DCE$DEFINE_OPTIONAL_COMMANDS.COM


      Please add the following command to SYS$STARTUP:SYSTARTUP_*.COM on your
      system. This ensures that DCE$STARTUP.COM is executed at system boot. The
      parameters supplied to DCE$STARTUP.COM depend on the specific TCP/IP
      product you intend to use. You will now be asked to select the name of
      this TCP/IP product, and the installation will supply you with the
      correct command for SYS$STARTUP:SYSTARTUP_*.COM.

 TCP/IP product                          Keyword

 Compaq's TCP/IP Services for OpenVMS    TCPIP
 Multinet from TGV                       MULTINET
 Pathway from Wollongong                 PATHWAY
 TCPware from Process Software           TCPWARE
 No TCP/IP Available at this time        NONE

Enter one of the keywords from the table above [TCPIP]:

Enter $ @SYS$STARTUP:DCE$STARTUP in your SYS$STARTUP:SYSTARTUP_*.COM

%DCE-S-INSTALL, Installation of OpenVMS DCE V3.0 completed
```

C
Sample Configuration Logs

The following sections contain sample logs of DCE configurations.

C.1 Initial Client Configuration

```
@SYS$MANAGER:DCE$SETUP CONFIG

   *** System Management Procedure, DCE for OpenVMS Alpha V3.0 ***

****************************    INFO     ****************************
***  DCE is configured to support 70 DCE Processes

%REGISTER-I-SUMMARY  images examined: 1, dependent images: 0

                  DCE Configuration Menu
                  DCE for OpenVMS Alpha V3.0

      1)  Client           Configure this system as a DCE client
      2)  New Cell         Create a new DCE cell
      3)  CDS Server       Add Master CDS Server
      4)  Modify           Modify DCE cell configuration
      5)  RPC_Only         Configure this system for RPC only

      0)  Exit             Exit this procedure
      ?)  Help             Display helpful information

Please enter your selection: 1

Starting DCE client configuration . . .

   At each prompt, enter your response.  You may enter <RETURN> for
   the default response, displayed in [brackets], or '?' for help.
   Entering a CONTROL-Z will terminate this configuration request.

Press <RETURN> to continue . . .

Removing temporary local DCE databases and configuration files

Removing permanent local DCE databases and configuration files

        Starting client configuration

   Initializing RPC & Security Client Services daemon (DCE$DCED) . . .
%RUN-S-PROC_ID, identification of created process is 2380A9A6

   Starting RPC & Security Client Services daemon (DCE$DCED) . . .
%RUN-S-PROC_ID, identification of created process is 238110A8

Would you like to search the LAN for known DCE cells  (YES/NO/?) [Y]? n

Please enter your DCE hostname [ylekot]:

Please enter the name for your DCE cell []: opnmnd-cell

Is the CDS Master Server within broadcast range  (YES/NO/?) [N]?

Please enter the hostname for the CDS Master Server []: opnmnd
Checking TCP/IP local host database for address of "opnmnd".  Please wait . . .
Checking BIND servers for address of "opnmnd".  Please wait . . .

   Terminating RPC Services/DCE Security Client daemon (DCE$DCED) . . .
```

Sample Configuration Logs
C.1 Initial Client Configuration

```
        ***  RPC (DCED) shutdown successful  ***

   Starting RPC & Security Client Services daemon (DCE$DCED) . . .
%RUN-S-PROC_ID, identification of created process is 2381282C

   Starting CDS Name Service Advertiser daemon (DCE$CDSADVER) . . .
%RUN-S-PROC_ID, identification of created process is 2380B22D

   Starting CDS Name Service Client daemon (DCE$CDSCLERK) . . .
%RUN-S-PROC_ID, identification of created process is 23811BAE

Could not find security master using dcecp registry show

        Attempting to locate security server
        Found security server
        Creating dce$local:[etc.security]pe_site.; file
        Checking local system time
        Looking for DTS servers in the LAN profile
        Looking for Global DTS servers in this cell
        Found DTS server

    The local system time is: Tue Oct  5 17:16:18 1999

Is this time correct?  (y/n): y

Do you need the Distributed Time Service?  (YES/NO/?) [Y]?

Do you intend to run MIT Kerberos 5 services on this machine?  (YES/NO/?) [N]?

Do you want to configure this host as an LDAP client?  (YES/NO/?) [N]?

   Terminating CDS Name Service Advertiser daemon (DCE$CDSADVER) . . .

   Terminating CDS Name Service Client daemon (DCE$CDSCLERK) . . .

Please enter the principal name to be used [cell_admin]:
Please enter the password for principal "cell_admin" (or ? for help):

Logging in to DCE using principal "cell_admin" . . .

Logging in to DCE using principal "cell_admin" . . .
   Configuring security client
    Creating Dce$Specific:[Krb5]Krb.conf

The following principal(s) already exist under /hosts/ylekot/:

/.../opnmnd-cell/hosts/ylekot/self

Do you wish to delete these principals?  (YES/NO/?) [Y]?

        Deleting client principals

        Creating ktab entry for client

   Terminating RPC & Security Client Services daemon (DCE$DCED) . . .

   Starting RPC & Security Client Services daemon (DCE$DCED) . . .
%RUN-S-PROC_ID, identification of created process is 238185B0

    Starting sec_client service (please wait).

    This machine is now a security client.

Press <RETURN> to continue . . .

    Configuring CDS client
        Creating the cds.conf file

   Starting CDS Name Service Advertiser daemon (DCE$CDSADVER) . . .
%RUN-S-PROC_ID, identification of created process is 238160B1

   Starting CDS Name Service Client daemon (DCE$CDSCLERK) . . .
%RUN-S-PROC_ID, identification of created process is 2381C334
```

```
        Testing access to CDS server (please wait) .

Logging in to DCE using principal "cell_admin" . . .
Checking TCP/IP local host database for address of "ylekot".  Please wait . . .

Configuring client host objects in the cell namespace . . .

        Creating /.:/hosts/ylekot objects in name space

Checking TCP/IP local host database for address of "ylekot".  Please wait . . .

Please enter the name of your LAN [16.32.16]:

    This machine is now a CDS client.

        Stopping sec_client service...

    Starting sec_client service (please wait).

        Modifying acls on /.:/hosts/ylekot/config
            secval
            xattrschema
            srvrexec
            keytab
            keytab/self
            hostdata
            hostdata dce_cf.db
            hostdata cell_name
            hostdata pe_site
            hostdata cds_attributes
            hostdata cds_globalnames
            hostdata host_name
            hostdata cell_aliases
            hostdata post_processors
            hostdata svc_routing
            hostdata krb.conf
            hostdata dfs-cache-info
            hostdata cds.conf
            hostdata passwd_override
            hostdata group_override
            srvrconf

Logging in to DCE using principal "cell_admin" . . .

    Configuring DTS daemon as client (DCE$DTSD)

        Starting DTS daemon (DCE$DTSD)...

   Starting Distributed Time Service daemon (DCE$DTSD) . . .
%RUN-S-PROC_ID, identification of created process is 2380F6BA

    This machine is now a DTS clerk.


Do you want to run the DCE Configuration Verification Program?  (YES/NO/?) [Y]? Y

Test requires that a DCE_LOGIN be performed

Logging in to DCE using principal "cell_admin" . . .

    Executing DCE for OpenVMS VAX V3.0 CVP (please wait)
    Copyright (c) Compaq Computer Corporation. 1999. All Rights Reserved.
```

C.1 Initial Client Configuration

```
.
.
.
.
.
.
.
.
.
.

     DCE for OpenVMS VAX V3.0 CVP was successful.

Press <RETURN> to continue . . .

                  DCE Configuration Menu
                  DCE for OpenVMS VAX V3.0

      1)  Client            Configure this system as a DCE client
      2)  New Cell          Create a new DCE cell
      3)  CDS Server        Add Master CDS Server
      4)  Modify            Modify DCE cell configuration
      5)  RPC_Only          Configure this system for RPC only

      0)  Exit              Exit this procedure
      ?)  Help              Display helpful information

Please enter your selection: 0

     ***  DCE System Management Procedure Complete  ***
```

C.2 Initial Server Configuration

```
@SYS$MANAGER:DCE$SETUP CONFIG

   *** System Management Procedure, DCE for OpenVMS Alpha V3.0 ***

****************************    INFO     ****************************
***  DCE is configured to support 70 DCE Processes

                  DCE Configuration Menu
                  DCE for OpenVMS Alpha V3.0

      1)  Client            Configure this system as a DCE client
      2)  New Cell          Create a new DCE cell
      3)  CDS Server        Add Master CDS Server
      4)  Modify            Modify DCE cell configuration
      5)  RPC_Only          Configure this system for RPC only

      0)  Exit              Exit this procedure
      ?)  Help              Display helpful information

Please enter your selection: 2

   At each prompt, enter your response.  You may enter <RETURN> for
   the default response, displayed in [brackets], or '?' for help.
   Entering a CONTROL-Z will terminate this configuration request.

Press <RETURN> to continue . . .

Starting DCE server configuration . . .

Please enter your DCE hostname [opnvms]:
```

```
Please enter the name for your DCE cell []: opnvms-cell

Do you wish to configure opnvms as a CDS server?  (YES/NO/?) [Y]?

Will there be any DCE pre-R1.1 CDS servers in this cell?  (YES/NO/?) [N]?

*************************************************************************
*    If the system clocks on the machines running the security          *
*    and CDS servers differ more than one or two minutes from           *
*    other systems in the cell, configuration anomalies can occur.      *
*    Since this system's time will be used as a reference, please       *
*    make sure that the system time is correct.                         *
*************************************************************************

System time for opnvms:  7-OCT-1999 16:45:30.09

Is this correct?  (YES/NO/?) [Y]?

Do you need the Distributed Time Service?  (YES/NO/?) [Y]?

Do you want this system to be a DTS Server?  (YES/NO/?) [Y]?

Do you want this system to be a DTS Global Server?  (YES/NO/?) [N]? y

Does this cell use multiple LANs?  (YES/NO/?) [N]?

Do you intend to run MIT Kerberos 5 services on this machine?  (YES/NO/?) [N]?

Do you want to configure the LDAP name service?  (YES/NO/?) [N]?

Since you have chosen not to create the LDAP name space, you can
not configure this machine as an LDAP client. You can create the
LDAP name space and add this machine as a client after the cell
is configured.

Do you want to configure gdad to use LDAP?  (YES/NO/?) [N]?

You have made the following selections:
    DCE Cellname:  opnvms-cell
    DCE Hostname:  opnvms
    Multi-LAN Cell?  No
    Use opnvms as a CDS Server?  Yes
    Use opnvms as the Security Server?   Yes
    Use opnvms as a DTS Global Server?   Yes
    Enable Kerberos 5 services?   No
    Enable LDAP GDA?   No
    Configure opnvms as an LDAP Client?   No

Do you want to save this as your DCE system configuration?  (YES/NO/?) [Y]?

Removing temporary local DCE databases and configuration files
Removing permanent local DCE databases and configuration files
```

```
*************************************************************************
*   Starting the security server requires that you supply               *
*   a 'keyseed.'  When asked for a 'keyseed,' type some                 *
*   random, alphanumeric keystrokes, followed by RETURN.                *
*   (You won't be required to remember what you type.)                  *
*************************************************************************

Enter keyseed for initial database master key:


    Configuring security server (DCE$SECD)

Please type new password for cell_admin (or '?' for help):

Type again to confirm:

    Creating Dce$Specific:[Krb5]Krb.conf

   Initializing RPC & Security Client Services daemon (DCE$DCED) . . .
%RUN-S-PROC_ID, identification of created process is 2B60164E

   Starting RPC & Security Client Services daemon (DCE$DCED) . . .
%RUN-S-PROC_ID, identification of created process is 2B601950

        Creating security master

   Starting Security Service Server daemon (DCE$SECD) . . .
%RUN-S-PROC_ID, identification of created process is 2B601951

    Starting sec_client service (please wait).


Logging in to DCE using principal "cell_admin" . . .

        Adding principals to the registry database
 Creating group /.:/subsys/dce/dced-admin...

    Configuring CDS server (DCE$CDSD)
        Adding CDS registry entries
        Creating the cds.conf file

   Starting CDS Name Service Advertiser daemon (DCE$CDSADVER) . . .
%RUN-S-PROC_ID, identification of created process is 2B601952

   Starting CDS Name Service Client daemon (DCE$CDSCLERK) . . .
%RUN-S-PROC_ID, identification of created process is 2B601953

   Starting CDS Name Service Server daemon (DCE$CDSD) . . .
%RUN-S-PROC_ID, identification of created process is 2B601954

Please enter Domain and Bind Server address. (e.g. org.company.com, w.x.y.z)
Domain name []: zko.dec.com

Domain Name Server address []: 16.30.0.20


   Starting Global Directory Agent daemon (DCE$GDAD) . . .
%RUN-S-PROC_ID, identification of created process is 2B601955

   Starting PC Name Service Interface daemon (DCE$NSID) . . .
%RUN-S-PROC_ID, identification of created process is 2B601956

        Testing access to CDS server (please wait) .


Logging in to DCE using principal "cell_admin" . . .

    Initializing the namespace
        Modifying acls on /.:  ...

Checking TCP/IP local host database for address of "opnvms".  Please wait . . .
```

```
       Modifying acls on /.:/subsys/dce/sec ...
       Modifying acls on /.:/cell-profile
       Modifying acls on /.:/lan-profile
       Modifying acls on /.:/opnvms_ch
       Modifying acls on /.:/subsys/dce/dfs
       Modifying acls on /.:/subsys/dce/dfs/bak
       Modifying acls on /.:/hosts
       Modifying acls on /.:/hosts/opnvms
       Modifying acls on /.:/sec
Modifying acls on /.:/sec-v1
       Modifying acls on /.:/hosts/opnvms/self
       Modifying acls on /.:/hosts/opnvms/cds-clerk
       Modifying acls on /.:/hosts/opnvms/cds-server
       Modifying acls on /.:/hosts/opnvms/cds-gda
       Modifying acls on /.:/hosts/opnvms/profile
       Modifying acls on /.:/fs
       Modifying acls on:
           principal
           principal/krbtgt
           principal/krbtgt/opnvms-cell
           principal/hosts
           principal/hosts/opnvms
           principal/hosts/opnvms/self
           principal/hosts/opnvms/cds-server
           principal/hosts/opnvms/gda
           group
           group/acct-admin
           group/subsys
           group/subsys/dce
           group/subsys/dce/sec-admin
           group/subsys/dce/dts-admin
           group/subsys/dce/dts-servers
           group/subsys/dce/dfs-admin
           group/subsys/dce/dfs-fs-servers
           group/subsys/dce/dfs-bak-servers
           group/subsys/dce/cds-admin
           group/subsys/dce/cds-server
           org
           policy
           principal/nobody
           principal/root
           principal/daemon
           principal/sys
           principal/bin
           principal/uucp
           principal/who
           principal/mail
           principal/tcb
           principal/dce-ptgt
           principal/dce-rgy
           group/none
           group/system
           group/daemon
           group/uucp
           group/bin
           group/kmem
           group/mail
           group/tty
           group/tcb
           org/none
           replist
           subsys/dce/sec
           sec
       Modifying acls on /.:/subsys/DEC/pc
       Stopping sec_client service...
```

```
    Starting sec_client service (please wait).


 Modifying acls on /.:/hosts/opnvms/config
     secval
     xattrschema
     srvrexec
     keytab
     keytab/self
     hostdata
     hostdata dce_cf.db
     hostdata cell_name
     hostdata pe_site
     hostdata cds_attributes
     hostdata cds_globalnames
     hostdata host_name
     hostdata cell_aliases
     hostdata post_processors
     hostdata svc_routing
     hostdata krb.conf
     hostdata dfs-cache-info
     hostdata cds.conf
     hostdata passwd_override
     hostdata group_override
     srvrconf
Logging in to DCE using principal "cell_admin" . . .

    Configuring DTS daemon as server (DCE$DTSD)
        Stopping sec_client service...

    Starting sec_client service (please wait).


Logging in to DCE using principal "cell_admin" . . .

        Starting DTS daemon (DCE$DTSD)...

   Starting Distributed Time Service daemon (DCE$DTSD) . . .
%RUN-S-PROC_ID, identification of created process is 2B601958

Do you want to run the DCE Configuration Verification Program?  (YES/NO/?) [Y]?


    Test requires that a DCE_LOGIN be performed

Logging in to DCE using principal "cell_admin" . . .

    Executing DCE for OpenVMS Alpha V3.0 CVP (please wait)
    Copyright (c) Compaq Computer Corporation. 1999. All Rights Reserved.


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     DCE for OpenVMS Alpha V3.0 CVP was successful.

Press <RETURN> to continue . . .
```

```
                DCE Configuration Menu
                DCE for OpenVMS Alpha V3.0

      1)  Client           Configure this system as a DCE client
      2)  New Cell         Create a new DCE cell
      3)  CDS Server       Add Master CDS Server
      4)  Modify           Modify DCE cell configuration
      5)  RPC_Only         Configure this system for RPC only

      0)  Exit             Exit this procedure
      ?)  Help             Display helpful information

Please enter your selection: 0

     ***  DCE System Management Procedure Complete  ***
```

C.3 Showing the DCE System Configuration and the DCE Daemons

```
$ @SYS$MANAGER:DCE$SETUP SHOW

   *** System Management Procedure, DCE for OpenVMS Alpha V3.0 ***

****************************    INFO     ****************************
***  DCE is configured to support 70 DCE Processes

This system has the following DCE configuration:

    Cellname:    opnmnd-cell
    Hostname:   opnmnd

    Service                                          Status
    ----------                                       ---------
    RPC & Security Client Services                   Enabled
    CDS Name Service                                 Master Server Enabled
    Global Directory Agent                           without LDAP Enabled
    LDAP client                                      Disabled
    Distributed Time Service                         Global Server Enabled
      Accept DECnet time (DTSS) sources              Disabled
    Distributed Time Service Null Time Provider      Disabled
    Distributed Time Service NTP Time Provider       Disabled
    KRB5 Services                                    Disabled
    Security Services                                Master Enabled
      Secval activated
    Auditing Subsystem daemon                        Disabled
    PC Name Service Interface                        Enabled
    Integrated login                                 Disabled

This system supports the following network transport protocols:

    TCP/IP:         [ncacn_ip_tcp]
    UDP/IP:         [ncadg_ip_udp]
    DECnet:         [ncacn_dnet_nsp]

TCP/IP services on this system are provided by: TCPIP

   TCP/IP Services for OpenVMS

The current cell is: opnmnd-cell

Based on this configuration, the following DCE daemons should be active:

        Daemon                      Process Name           Process ID
```

```
   RPC & Security Client Services    DCE$DCED                20C119C0
   Security Service Server           DCE$SECD                20C119C1
   CDS Name Service Advertiser       DCE$CDSADVER            20C109C2
   CDS Name Service Client           DCE$CDSCLERK            20C119C3
   CDS Name Service Server           DCE$CDSD                20C119C4
   Global Directory Agent            DCE$GDAD                20C119C5
   PC Name Service Interface         DCE$NSID                20C112D1
   Distributed Time Service          DCE$DTSD                20C119D3

     ***  DCE System Management Procedure Complete  ***
```

C.4 Modifying Configuration

```
$ @SYS$MANAGER:DCE$SETUP CONFIG

*** System Management Procedure, DCE for OpenVMS Alpha V3.0 ***

****************************    INFO     ****************************
***  DCE is configured to support 70 DCE Processes

This system has the following DCE configuration:

    Cellname:   opnmnd-cell
    Hostname:   ylekot

    Service                                                 Status
    ----------                                             ---------
    RPC & Security Client Services                          Enabled
    CDS Name Service                                        Clerk Enabled
    CDS Cached Server Host                                  opnmnd (16.32.192.214)
    LDAP client                                             Disabled
    Distributed Time Service                                Clerk Enabled
      Accept DECnet time (DTSS) sources                     Disabled
    Distributed Time Service Null Time Provider             Disabled
    Distributed Time Service NTP Time Provider              Disabled
    KRB5 Services                                           Disabled
    Security Services                                       Client Enabled
      Secval activated
    Auditing Subsystem daemon                               Disabled
    PC Name Service Interface                               Disabled
    Integrated login                                        Disabled

This system supports the following network transport protocols:

    TCP/IP:          [ncacn_ip_tcp]
    UDP/IP:          [ncadg_ip_udp]
    DECnet:         [ncacn_dnet_nsp]

TCP/IP services on this system are provided by: TCPIP

   TCP/IP Services for OpenVMS

The current cell is: opnmnd-cell

Based on this configuration, the following DCE daemons should be active:

            Daemon                     Process Name             Process ID

   RPC & Security Client Services      DCE$DCED                 238185B0
   CDS Name Service Advertiser         DCE$CDSADVER             238160B1
   CDS Name Service Client             DCE$CDSCLERK             2381C334
   Distributed Time Service            DCE$DTSD                 2380F6BA

****************************   WARNING   ****************************
Executing this procedure will potentially modify this configuration.

Do you want to proceed with this reconfiguration?  (YES/NO/?) [Y]?
```

```
                DCE Configuration Menu
                DCE for OpenVMS Alpha V3.0

      1)  Client            Configure this system as a DCE client
      2)  New Cell          Create a new DCE cell
      3)  CDS Server        Add Master CDS Server
      4)  Modify            Modify DCE cell configuration
      5)  RPC_Only          Configure this system for RPC only

      0)  Exit              Exit this procedure
      ?)  Help              Display helpful information

Please enter your selection: 4

            *** Modify Configuration Menu ***
                  DCE for OpenVMS Alpha V3.0

      1) Add Replica CDS Server
      2) Add Replica Security Server
      3) Add DTS Local Server
      4) Add DTS Global Server
      5) Add Null Time Provider
      6) Add NTP Time Provider
      7) Enable Auditing
      8) Enable DCE Integrated Login
      9) Enable Kerberos 5
     10) Configure LDAP Name Service
     11) Add LDAP Client Service
     12) Enable LDAP GDA
     13) Register in X.500

      0)  Exit         Return to previous menu
      ?)  Help         Display helpful information

Please enter your selection:
```

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