



DCE and DFS for HP® (Compaq®) Tru64® UNIX®

Installation and Configuration Guide

Software Version 4.2

Notices

DCE for Tru64 UNIX Installation and Configuration Guide - Software Version 4.2 -
Revised February, 2002

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Preface

Intended Audience

The audience for this guide includes the following:

- Experienced programmers who want to write client/server applications.
- Experienced programmers who want to port existing applications to DCE.
- System managers who manage the distributed computing environment.
- Users who want to run distributed applications.

Overview of this Guide

The *Gradient® DCE for Tru64 UNIX® Installation and Configuration Guide* describes how to install and configure Gradient DCE on Tru64 UNIX™ Version 5.0, 5.0a, 5.1, and 5.1a systems. The guide provides users of the Distributed Computing Environment (DCE) with supplemental information necessary to use Gradient DCE and is intended to be used with the documents listed under *Related Documentation*.

The installation procedure creates DCE file directories subordinate to the **/usr/opt** directory and loads DCE software subsets.

Gradient DCE v4.2 is a layered product on the Tru64 UNIX Versions 5.1a operating system. It supports TruCluster and Sierra Cluster. It is a compatible upgrade of DCE for Tru64 UNIX Version 4.0. ?? It consists of a full DCE implementation as defined by The Open Group (TOG).

Gradient DCE v4.1 was a layered product on the Tru64 UNIX Version 5.1, Gradient DCE v4.0 was a layered product on the Tru64 UNIX Version 5.0, 5.0a and 5.1 operating systems. It was a compatible upgrade of DCE for Tru64 UNIX Version 3.1. for Tru64 UNIX Version 5.0, 5.0a, and prior DCE kits. It consists of a full DCE implementation as defined by The Open Group (TOG). This software includes these components:

- Remote Procedure Call (RPC)
- Cell Directory Service (CDS)
- Distributed Time Service (DTS)
- DCE Security
- DCE Distributed File Service (DFS, based on DCE Release 1.2.2)
- Lightweight Directory Access Protocol (LDAP)

NOTE: The products named Gradient DCE v3.1 (and higher), Digital DCE v3.1, and Compaq DCE v3.1 provide essentially the same features; however, only Gradient DCE functions on the Tru64 UNIX v5.x operating system. Although other company names may be referenced within this document (Digital, Compaq, or Gradient Technologies), this DCE product is now produced and supported by Entegriety Solutions® Corporation.

Conventions

The following conventions are used in this guide:

UPPERCASE and lowercase	The operating system differentiates between lowercase and uppercase characters. Literal strings that appear in text, examples, syntax descriptions, and function definitions must be typed exactly as shown.
bold	Boldface type in interactive examples indicates typed user input. In general text reference, bold indicates file names and commands.
<i>italics</i>	Italic type indicates variable values, placeholders, and function argument names.
special type	Indicates system output in interactive and code examples.
%	The default user prompt is your system name followed by a right angle bracket (>). In this manual, a percent sign (%) is used to represent this prompt.
#	A number sign (#) represents the superuser prompt.
Ctrl/x	This symbol indicates that you hold down the Ctrl key while pressing the key or mouse button that follows the slash.
<Return>	Refers to the key on your terminal or workstation that is labeled with Return or Enter.

Related Documentation

The following documents are available in HTML and Acrobat format on the Entegrity software CD:

- *Gradient DCE for Tru64 UNIX Installation and Configuration Guide* (this guide) — Describes how to install DCE and configure and manage your DCE cell.
- *Gradient DCE for Tru64 UNIX Product Guide* — Provides supplemental documentation for Gradient DCE value-added features.
- *Gradient DCE for Tru64 UNIX Reference Guide* — Provides supplemental reference information for Gradient DCE value-added features.
- *Gradient DCE for Tru64 UNIX Release Notes* — Lists new features, bug fixes, and known problems and restrictions.

The following OSF DCE Release 1.2.2 technical documentation is provided on the Entegrity software CD in PDF format:

- *Introduction to OSF DCE* — Contains a high-level overview of DCE technology including its architecture, components, and potential use.
- *OSF DCE Administration Guide - Introduction* — Describes the issues and conventions concerning DCE as a whole system and provides guidance for planning and configuring a DCE system.
- *OSF DCE Administration Guide - Core Components* — Provides specific instructions on how core components should be installed and configured.

- *OSF DCE Application Development Guide - Introduction and Style Guide* — Serves as a starting point for application developers to learn how to develop DCE applications.
- *OSF DCE Application Development Guide - Core Components* — Provides information on how to develop DCE applications using core DCE components such as RPC and security.
- *OSF DCE Application Development Guide - Directory Services* — Contains information for developers building applications that use DCE Directory Services.
- *OSF DCE Application Development Reference* — Provides reference information for DCE application programming interfaces.
- *OSF DCE Command Reference* — Describes commands available to system administrators.

Contacting Entegriy Solutions

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Obtaining Technical Support

If you purchased your Gradient DCE for Tru64 UNIX product directly from Entegrity Solutions Corporation or Gradient Technologies, Inc. you are entitled to 30 days of limited technical support beginning on the day the product is expected to arrive.

You may also purchase a support plan that entitles you to additional services. You *must* register prior to receiving this support. For details, refer to the customer support information package that accompanied your shipment or refer to the Technical Support area of <http://support.entegrity.com>. The web site also contains online forms for easy registration.

If you purchased Gradient DCE for Tru64 UNIX from a reseller, please contact the reseller for information on obtaining technical support.

Obtaining Additional Technical Information

Contact	Address	Phone/Fax/Email
The Open Group™ Developer of DCE (Distributed Computing Architecture) software and standards.	The Open Group™ 29B Montvale Ave Woburn MA 01801 U. S. A.	Tel: +1 781-376-8200 Fax: +1 781-376-9358 http://www.opengroup.org

Obtaining Additional Documentation

All documentation for your Gradient DCE for Tru64 UNIX product is provided in electronic format on the same CD on which the product ships. See the product CD for information on accessing this documentation.

Documentation for all of Entegrity's products is available at <http://support.entegrity.com>. Enter the Support Web area and click the Documentation link.

We are always trying to improve our documentation. If you notice any inaccuracies or cannot find information, please send email to docs@entegrity.com. We welcome any comments or suggestions.

CHAPTER 1

Installing DCE for Tru64 UNIX



1.1 Overview of License Registration

The License Product Authorization Key (PAK) is no longer needed. The written license is still in effect.

1.2 Installation Options

Gradient® DCE for Tru64 UNIX provides the additional option of installing DCE in a Dataless Management System (DMS) environment. You can find instructions for a DMS installation on *Section 1.13 on page 41*.

1.3 Installation Prerequisites

Follow this sequence for installing DCE and creating a cell with servers and clients:

- 1 Install the DCE software.
- 2 Create a cell.
- 3 Configure a client after you create your cell.

NOTE: You can stop the installation procedure at any time by pressing <Ctrl/C>. Files created up to that point are not deleted. You must delete the created files manually.

1.3.1 Hardware Requirements

To perform the installation, you need the following hardware:

- A Tru64 UNIX version 5.1 machine, minimum 96 MB memory
- A CD-ROM drive for reading the distribution media

You must know how to load the CD-ROM provided with the software distribution kit on the appropriate drive. See the *Compact Disc User's Guide* for more information.

1.3.2 Software Requirements

To perform the installation, you need a system with the Tru64 UNIX Version 5.1 operating system installed. To determine the version number of your operating system, enter the following command:

```
# sizer -v
```

Before installing DCE, you must install the following subsets provided with the operating system:

- Document Preparation Tools (OSFDCMT) — This subset is a prerequisite for using the DCE reference pages (manpages); it includes text-processing tools and several macro packages.
- Software Development Environment (OSFPGMR) — This subset is a prerequisite if you want to build DCE applications with the Application Developer's Kit subset; it contains include files required by DCE applications.
- Standard Header Files (OSFINCLUDE) — This subset is a prerequisite if you want to build DCE applications with the Application Developer's Kit subset; it contains header files required by DCE applications.

1.3.3 Disk Space Requirements

The table below lists the disk storage requirements for the subsets installed with the DCE kit.

Table 1-1: Disk Space Requirements for DCE Subsets

Subset Name	Disk Space (in Megabytes)
DCERTS410	19.0
DCECDS410	1.0
DCESEC410	3.0
DCEADK410	1.4
DCEMAN410	1.0
DCEADKMAN410	1.3
DCEDFS410	3.5
DCEDFSBIN410	2.4
DCEDFSUTL410	1.0
DCEDFSMAN410	1.0
DCEDFSNFSSRV410	1.0
TOTAL (for all subsets)	35.6

An initial DCE server configuration (consisting of dced, cdsd, cdsadv, two cdsclerks, secd, and dtsd) consumes 50 MB of swap space. A DCE client configuration (consisting of dced, cdsadv, one cdsclerk, and dtsd) consumes 25 MB of swap space. Large cell configurations may require additional swap and disk space.

1.3.4 Privileges Required

You must have superuser (root) privileges on the system on which you are installing DCE.

1.4 Performing a DCE Cell Backup

Entegrity Solutions® recommends that you 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 your Tru64 UNIX documentation. To back up DCE databases from an existing configuration, Entegrity recommends that you back up files in /opt/dcelocal and /krb5 by using the following command:

```
tar cf $ DCE_BACKUP_DIR/dcebackup.tar \
./krb5 \
./opt/dcelocal/*.db \
./opt/dcelocal/etc \
./opt/dcelocal/var/adm/directory/cds/clerk_mgmt_acl_* \
./opt/dcelocal/var/adm/security \
./opt/dcelocal/var/adm/time/dtsd.acl \
./opt/dcelocal/var/audit \
./opt/dcelocal/var/dced \
./opt/dcelocal/var/dfs \
./opt/dcelocal/var/directory \
./opt/dcelocal/var/svc/routing \
./opt/dcelocal/var/security
```

NOTE: The above command does not contain the full list of files under the /opt/dcelocal/ directory. Additionally, any DCE application specific files and directories may need to be archived as well. Such files include, but are not limited to, application specific local keytable files.

1.5 Re-Installing DCE Over an Older Version of DCE

Before reinstalling either the current version or a new version of the Gradient DCE for Tru64 UNIX software, perform the following steps:

Remove existing DCE software subsets.

To determine whether any existing subsets have been installed, enter the following command:

```
# setld -i | grep DCE | grep “_ _installed”
```

(The `_ _` indicates to enter two spaces)

If a subset is installed, you see a display similar to the following:

```
DCECDS410 installed      DCE CDS Server V4.1
```

If the subset has not been installed, the words *not installed* appear in the middle column. (prior to v5.0a this came up as blank; but if installed, it said installed.)

Delete any existing DCE subsets as follows:

```
# setld -d subset-id [subset-id...]
```

where *subset-id* is the subset name and version number. For example, to delete the Runtime Services subset, enter this command (where *410* is the subset version number):

```
# setld -d DCERTS410
```

Re-execute the `setld` command to reinstall the DCE kit where *kit_location* is the directory containing the DCE subsets:

```
# setld -l <kit_location>
```

If you do not want to delete your current DCE configuration, answer `n` when the installation procedure displays the following prompt:

Directory `/opt/dcelocal` exists. It may contain the DCE databases.

Do you want to delete the old DCE databases? (y/n/?) [n]:

1.6 Choosing Subsets to Install

DCE includes the following installation subsets:

Table 1-2: Subsets

Subset Name	Essential Information
DCE Application Developer's Kit V4.1 (DCEADK410)	This subset includes the RPC IDL compiler, XDS interface to CDS, and other tools required for developing DCE applications.
DCE Application Developer's Kit Manual Pages V4.1 (DCEADKMAN410) (optional)	This subset consists of online application development reference pages (manpages) for programming reference information.
DCE CDS Server V4.1 (DCECDS410)	This subset provides a directory service for naming and locating users, applications, files, and systems within a DCE cell. This subset includes the CDS server and the Global Directory Agent (GDA).

Table 1-2: Subsets (Continued)

Subset Name	Essential Information
DCE Command Manual Pages V4.1 (DCEMAN410)(optional)	This subset consists of online reference (manpages) pages for managing DCE. It also includes HTML versions of OSF and Entegrity documentation.
DCE DFS Base OS Services V4.1 (DCEDFS410)	The DCEDFS (runtime) subset has to be installed to use the DCE Distributed File Service.
DCE DFS Kernel Binaries V4.1 (DCEDFSBIN410)	The DCEDFSBIN subset must be installed to use DCE/DFS.
DCE DFS Command Manual Pages V4.1 (DFSMAN410) (optional)	This subset consists of online reference (manpages) pages for managing DFS.
DCE DFS NFS-DFS Secure Gateway Server V4.1 (DCEDFSNFSSRV410)	The DCEDFSNFSSRV subset must be installed to use the NFS-DFS Secure Gateway Server.
DCE DFS Utilities and Debugging Tools V4.1 (DCEDFSUTIL410)	This subset is optional. These are primarily diagnostic programs and are not part of normal use. They do not need to be installed to use DCE/DFS, although they can make it easier to diagnose problems or run DCE/DFS tests.
DCE Runtime Services V4.1 (DCERTS410)	This subset consists of base services required for the runtime execution of DCE applications. These services include the RPC runtime and DTS clerk and server. The CDS clerk, the security client, the PC Nameserver Proxy Agent, XDS runtime, (nsid), and various administrative utilities are also included in this subset. You must install this subset on all systems on which you want to run DCE applications.
DCE Security Server V4.1 (DCESEC410)	This subset provides secure communications and controlled access to resources in a distributed environment. It includes the registry/KDC/Privilege server (secd) and security administration tools (sec_admin).

See the *Gradient DCE for Tru64 UNIX Product Guide* for more information about the subsets included in this kit.

1.7 Installation Steps For a Non-TruCluster Environment

Be aware before you begin:

- Databases can be saved and reused from prior releases. The installation procedure asks whether you want to delete them or not. To make sure databases are saved, do not use clean or clobber when performing the installation. Also, databases in V1.3 format can be converted to V2.0 format.
- If you want to stop the installation at any point, press <Ctrl/C>; however, you must then delete any subsets that have been created up to that point. To delete the subsets, perform the steps in step 2 below.:

STEPS

- 1 Log in as superuser (login name **root**) to the system on which you are installing the DCE software.

- 2 Remove existing DCE software subsets (kits).

To determine whether any existing subsets have been installed, enter the following command:

```
# setld -i | grep DCE | "grep_ _installed"
```

(The `_ _` indicates to enter two spaces.)

If a subset is installed, you see a display similar to the following:

```
DCECDS410      installed      DCE CDS Server V4.1
```

If the subset has not been installed, the words “not installed” appear in the middle column. (prior to v5.0a this came up as blank; but if installed, it said installed.)

To remove the existing DCE subsets, use the following syntax:

```
# setld -d subset-id [subset-id...]
```

where subset-id is the subset name and version number. For example, to delete the Runtime Services subset, enter this command where xxx is the subset version number:

```
# setld -d DCERTSxxx
```

- 3 After deleting any previous versions of DCE software, you can load the subsets in the DCE software either by changing directories to where the software is placed, then entering the setld command OR you can enter the setld command followed by the location where the software is placed, as in the following examples:

```
# cd <kit_location>
```

```
# setld -l
```

If you mounted the DCE CDROM on the /mnt/ directory, then the kit location is /mnt/kit

OR

```
# setld -l <kit_location>
```

```
# setld -l /mnt/kit
```

- 4 After several seconds, the installation procedure displays the names of the optional subsets and prompts you to specify the subsets that you want to install.

The subsets listed below are optional:

There may be more optional subsets than can be presented on a single screen. If this is the case, you can choose subsets screen by screen or all at once on the last screen. All of the choices you make will be collected for your confirmation before any subsets are installed.

- 1) DCE Application Developers Kit V4.1
- 2) DCE Application Developers Manual Pages V4.1
- 3) DCE Cell Directory Server V4.1
- 4) DCE Command Reference Manual Pages V4.1
- 5) DCE DFS Base V4.1
- 6) DCE DFS Kernel Binaries V4.1
- 7) DCE DFS Man Pages V4.1
- 8) DCE DFS NFS-DFS Secure Gateway Server V4.1
- 9) DCE DFS Utilities/Debug V4.1
- 10) DCE Runtime Services V4.1
- 11) DCE Security Server V4.1

Or you may choose one of the following options:

- 12) ALL of the above
- 13) CANCEL selections and redisplay menus
- 14) EXIT without installing any subsets

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6):12

Load the subsets that you want to install.

NOTE: For a minimum cell configuration, choose options 3, 10, and 11. If you specify more than one at the prompt, separate each number with a space, not a comma.

- 5 Next, the installation procedure lets you verify your choice. For example, if you enter 12 in response to the previous prompt, you see the following display:

You are installing the following optional subsets:

DCE Application Developers Kit V4.1
DCE Application Developers Manual Pages V4.1
DCE Cell Directory Server V4.1
DCE Command Reference Manual Pages V4.1
DCE DFS Base V4.1
DCE DFS Kernel Binaries V4.1
DCE DFS Man Pages V4.1
DCE DFS NFS-DFS Secure Gateway Server V4.1
DCE DFS Utilities/Debug V4.1
DCE Runtime Services V4.1
DCE Security Server V4.1

Is this correct? (y/n):y

If the subsets displayed are those you want to install, enter y. The installation procedure then checks the system space.

Checking file system space required to install selected subsets:

File system space checked OK.

11 subset(s) will be installed.

The installation procedure displays the subsets being installed.

Loading 1 of 11 subset(s)...

DCE Runtime Services V4.1

Copying from (disk)

Working... Fri Mar 12 07:19:26 EST 2000

Verifying

Loading 2 of 11 subset(s)...

DCE Security Server V4.1

Copying from (disk)

Verifying

Loading 3 of 11 subset(s)....

DCE Cell Directory Server V4.1

Copying from (disk)

Verifying

Loading 4 of 11 subset(s)....

DCE Application Developers Kit V4.1

Copying from (disk)

Working... Fri Mar 12 07:19:26 EST 2000

Verifying

Loading 5 of 11 subset(s)....

DCE Command Reference Manual Pages V4.1

Copying from (disk)

Verifying

Loading 6 of 11 subset(s)....

DCE Application Developers Manual Pages V4.1

Copying from (disk)

Working... Fri Mar 12 07:19:26 EST 2000

Verifying

Loading 7 of 11 subset(s)....

DCE DFS Base V4.1

Copying from (disk)

Verifying

Loading 8 of 11 subset(s)....

DCE DFS Kernel Binaries V4.1

Copying from (disk)

Verifying

Loading 9 of 11 subset(s)....

DCE DFS Utilities/Debug V4.1

Copying from (disk)

Verifying

Loading 10 of 11 subset(s)....

DCE DFS Man Pages V4.1

Copying from (disk)

Verifying

Loading 11 of 11 subset(s)....

DCE DFS NFS-DFS Secure Gateway Server V4.1

Copying from (disk)

Verifying

11 of 11 subset(s) installed successfully.

Configuring "DCE Runtime Services V4.1" (DCERTS410)

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appl i cable.

1.8 Choices: Preserve or Replace Old DCE Databases

At the end of the installation procedure, the screen displays the following message and asks—if you have existing DCE databases from a previous configuration—whether you want to delete them:

```
=====
```

Beginning configuration of DCE Version 4.1.

You will be asked a few questions before configuration can proceed.

Online help is available where the prompt contains a "?" choice.

```
=====
```

If DCE was installed previously, the following message is displayed:

Directory /opt/dcelocal exists. It may contain the DCE databases.

Do you want to delete the old DCE databases? (y/n/?) [n]:

You might have existing DCE local databases. These databases can contain information from your previous DCE configuration. This information includes your cell name, the cell namespace database, security credentials, and the DCE services you used in the previous configuration. The installation script will make the DCE databases specific for each of the cluster members.

If you type “n” or press <return> (the default), you preserve the old DCE configuration.

If you type “y”, you delete the old configuration and the following message displays:

The existing DCE databases will be removed upon the successful completion of installation of DCERTS410.

IMPORTANT:

For SECURITY reasons, you may want to make sure that the location you will type now is native to this host; i.e., is not NFS mounted!

The configuration portion automatically creates local copies of files in the DCE permanent file system and other files and directories required to run the DCE services.

The installation procedure prompts you to choose a directory under which these local files are to be located:

Please enter the location for new DCE local databases,
or press <RETURN> for the default location [/var]:

You can specify the default or enter another directory name; the directory is created if it does not already exist. The entire directory tree initially requires about 100 KB of disk space; it requires more space as you use the DCE services. The installation procedure now completes installation of the subsets.

Whether you entered yes or no, the following lines show:

```
There will be no more questions asked for the remainder of the configuration.
Creating DCE local directory structure.
```

If you had answered yes, to delete old databases, two lines follow here:

```
Removing old DCE local databases as directed.
Created new DCE local database directory /opt/dcelocal
```

Whether you entered yes or no, the following lines show:

```
=====
Installation of all the requested DCE subsets is completed.
You have installed the DCE software which requires further action
to configure and start it. To do so please invoke "/usr/sbin/dcesetup"
and select option 1 (Configure DCE services) from the main menu.
=====
```

1.9 Error Recovery During Installation

If errors occur during the installation, the system displays failure messages. Errors can occur during the installation if any of the following conditions exist:

- The prerequisite software version is incorrect.
- The system parameter values (such as disk space) for this system are insufficient for successful installation.
- A previous DCE version is installed on the system.

If the installation fails because of insufficient disk space, the setld procedure displays an error message similar to the following:

```
There is not enough file system space for subset DCERTS410
DCERTS410 will not be loaded.
```

If the usr file system is read-only during installation, the procedure displays the following error message:

```
Warning: The usr filesystem is not writable. Therefore links from it to the
permanent filesystem will not be made.
```

When the Tru64 UNIX system displays this message, the installation of the shared DCE library fails. In this case, the DCE services can not be configured or started because they rely on the shared DCE library. You should reinstall with a writable usr file system.

If you encounter errors from the setld utility during the installation, see the Diagnostics section of the setld(8) reference page for an explanation of the error and the appropriate action to take. If an error occurs while you are using DCE, and you believe the error is caused by a problem with the product, contact Entegriety Technical Support (support@entegriety.com).

1.10 Installing DCE in a TruCluster or Sierra Cluster Environment

For cluster installations, the installation scripts first install the common files to shared cluster locations, then to the member template area (member 0), and then onto each of the members in member specific locations.

Be aware before you begin:

- If Installing DFS: first configure DCE with dcesetup, then configure DFS with dfssetup. Dfssetup is described in *Gradient DCE for Tru64 UNIX Distributed File Service (DFS) Configuration Guide*.
- DMS is not supported in a clustered environment though it is supported in a non-clustered environment.
- It is preferable to install on a cluster rather than on a specified member. Unless specified to install on a specific member using the member installation switch provided by the setld command, DCE is installed on all members of a cluster.

To find a member's status enter:

```
# setld -i -m < cluster member name >
```

(where i means the kit installation inventory and m means member. The man pages explain setld.)

- Databases can be saved and reused from prior releases. The installation procedure asks whether you want to delete them or not. To make sure databases are saved, do not use clean or clobber when performing the installation. Also, databases in V1.3 format can be converted to V2.0 format.
- If you want to stop the installation at any point, press <Ctrl/C>; however, you must then delete any subsets that have been created up to that point. To delete the subsets, perform the steps in step 2 below.:

STEPS

- 1 Log in as superuser (login name **root**) to the system on which you are installing the DCE software

- 2 Remove existing DCE software subsets(kits).

To determine whether any existing subsets have been installed, enter the following command:

```
# setld -i | grep DCE | "grep_ _installed"
```

(The `_ _` indicates to enter two spaces.)

If a subset is installed, you see a display similar to the following:

```
DCECDS410      installed      DCE CDS Server V4.1
```

If the subset has not been installed, the words "not installed" appear in the middle column. (prior to v5.0a this came up as blank; but if installed, it said installed.)

To remove the existing DCE subsets, use the following syntax:

```
# setld -d subset-id [subset-id...]
```

where subset-id is the subset name and version number. For example, to delete the Runtime Services subset, enter this command where xxx is the subset version number:

```
# setld -d DCERTSxxx
```

- 3 After deleting any previous versions of DCE software, you can load the subsets in the DCE software either by changing directories to where the software is placed, then entering the setld command OR you can enter the setld command followed by the location where the software is placed, as in the following examples:

```
# cd <kit_location>
```

```
# setld -l
```

If you mounted the DCE CDROM on the `/mnt/` directory, then the kit location is `/mnt/kit`.

OR

```
# setld -l <kit_location>
```

```
# setld -l /mnt/kit
```

- 4 After several seconds, the installation procedure displays the names of the optional subsets and prompts you to specify the subsets that you want to install.

NOTE: The example here is to install without DFS, in order to later show installing DFS. You can install DFS in the original installation.

The subsets listed below are optional:

There may be more optional subsets than can be presented on a single screen. If this is the case, you can choose subsets screen by screen or all at once on the last screen. All of the choices you make will be collected for your confirmation before any subsets are installed.

- 1) DCE Application Developers Kit V4.1
- 2) DCE Application Developers Manual Pages V4.1
- 3) DCE Cell Directory Server V4.1
- 4) DCE Command Reference Manual Pages V4.1
- 5) DCE DFS Base V4.1
- 6) DCE DFS Kernel Binaries V4.1
- 7) DCE DFS Man Pages V4.1
- 8) DCE DFS NFS-DFS Secure Gateway Server V4.1
- 9) DCE DFS Utilities/Debug V4.1
- 10) DCE Runtime Services V4.1
- 11) DCE Security Server V4.1

Or you may choose one of the following options:

- 12) ALL of the above
- 13) CANCEL selections and redisplay menus
- 14) EXIT without installing any subsets

Estimated free disk space(MB) in root: 285.6 usr: 636.3 var: 1140.9

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6): 1-4 10 11

- 5 Load all but the DFS subsets.

NOTE: If you specify more than one at the prompt, separate each number with a space, not a comma.

NOTE: While, in this example all DCE kits are installed, it is recommended that you only install the Command Reference Manual Pages and the Runtime Services in a cluster environment (: 4 10). The others might work, but are not fully tested, so are not supported. Also, before loading the kits, make sure that you have the proper license.

- 1) DCE Application Developers Kit V4.1
 - 2) DCE Application Developers Manual Pages V4.1
 - 3) DCE Cell Directory Server V4.1
 - 4) DCE Command Reference Manual Pages V4.1
 - 10) DCE Runtime Services V4.1
 - 11) DCE Security Server V4.1
- 6 Next, the installation procedure lets you verify your choice. For example, if you enter 1-4 10 11 in response to the previous prompt, you see the following display:

You are installing the following optional subsets:

DCE Application Developers Kit V4.1
DCE Application Developers Manual Pages V4.1
DCE Cell Directory Server V4.1
DCE Command Reference Manual Pages V4.1
DCE Runtime Services V4.1
DCE Security Server V4.1

Estimated free disk space(MB) in root: 285.6 usr: 265.7 var: 1140.3

Is this correct? (y/n): y

Checking file system space required to install selected subsets:

File system space checked OK.

6 subsets will be installed.

Loading subset 1 of 6 ...

DCE Runtime Services V4.1

Copying from . (disk)

Working... Mon Mar 12 14:51:41 EST 2001

Verifying

Loading subset 2 of 6 ...

DCE Security Server V4.1

Copying from . (disk)

Verifying

Loading subset 3 of 6 ...

DCE Cell Directory Server V4.1

Copying from . (disk)

Verifying

Loading subset 4 of 6 ...

DCE Application Developers Kit V4.1

Copying from . (disk)

Verifying

Loading subset 5 of 6 ...

DCE Command Reference Manual Pages V4.1

Copying from . (disk)

Verifying

Loading subset 6 of 6 ...

DCE Application Developers Manual Pages V4.1

Copying from . (disk)

Working... Mon Mar 12 14:52:54 EST 2001

Verifying

6 of 6 subsets installed successfully.

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1.11 Choices: Preserve or Replace Old Databases

During the installation procedure, the screen displays the following message and asks—if you have existing DCE databases from a previous configuration—whether you want to delete them:

```
=====
Beginning configuration of DCE Version 4.1.
```

You will be asked a few questions before configuration can proceed. Online help is available where the prompt contains a "?" choice.

```
=====
If DCE was installed previously, the following message is displayed:
Directory /opt/dcelocal exists. It may contain the DCE databases.
Do you want to delete the old DCE databases? (y/n/?) [n]:
```

You might have existing DCE local databases. These databases can contain information from your previous DCE configuration. This information includes your cell name, the cell namespace database, security credentials, and the DCE services you used in the previous configuration. The installation script will make the DCE databases specific for each of the cluster members.

If you type “n” or press <return> (the default), you preserve the old DCE configuration.

If you type “y”, you delete the old configuration and the following message displays:

The existing DCE databases will be removed upon the successful completion of installation of DCERTS410.

IMPORTANT:

For SECURITY reasons, you may want to make sure that the location you will type now is native to this host; i.e., is not NFS mounted!

The configuration portion automatically creates local copies of files in the DCE permanent file system and other files and directories required to run the DCE services.

The installation procedure prompts you to choose a directory under which these local files are to be located:

Please enter the location for new DCE local databases,

or press <RETURN> for the default location [/var]:

You can specify the default or enter another directory name; the directory is created if it does not already exist. The entire directory tree initially requires about 100 KB of disk space; it requires more space as you use the DCE services. The installation procedure now completes installation of the subsets.

Whether you entered yes or no, the following lines show:

=====

There will be no more questions asked for the remainder of the configuration.
Creating DCE local directory structure.

=====

If you had answered yes, to delete old databases, two lines follow here:

Removing old DCE local databases as directed.

Created new DCE local database directory /opt/dcelocal

Whether you entered yes or no, the following lines show:

Creating DCE local directory structure

Removing old DCE local databases as directed.

Created new DCE local database directory /opt/dcelocal

Creating DCE File Links

Created cds1 for DCE local directory /var/dcelocal

Created cds1 for Kerberos directory /krb5

Created cds1 for SIA directory /etc/sia

Created cds1 for Kerberos 5 configuration file /etc/krb5.conf

Adding DCE Setup desktop icon

There will be output for each member, as follows:

Configuring "DCE Runtime Services V4.1" (DCERTS410) on member0

Creating local DCE File Links (member1)

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Creating DCE File Links

Configuring "DCE Security Server V4.1" (DCESEC410) on member0

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applicable.

Creating DCE File Links

Configuring "DCE Cell Directory Server V4.1" (DCECDS410) on member0

=====
Installation of all the requested DCE subsets is completed.

You have installed the DCE software which requires further action to configure and start it. To do so please invoke “/usr/sbin/dcesetup” and select option 1 (Configure DCE services) from the main menu.

=====

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Creating DCE File Links

Configuring “DCE Application Developers Kit V4.1” (DCEADK410) on member0

Creating local DCE File Links (member1)

=====
Installation of all the requested DCE subsets is completed.

=====

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Creating DCE File Links

Configuring "DCE Command Reference Manual Pages V4.1" (DCEMAN410) on member0

Creating local DCE File Links (member1)

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Creating DCE File Links

Configuring "DCE Application Developers Manual Pages V4.1" (DCEADKMAN410) on member0

Creating local DCE File Links (member1)

=====
Installation of all the requested DCE subsets is completed.
=====

Configuring "DCE Runtime Services V4.1" (DCERTS410) on member1

Creating local DCE File Links (member1)

=====
Installation of all the requested DCE subsets is completed. (member1)
=====

Configuring "DCE Security Server V4.1" (DCESEC410) on member1

=====
Installation of all the requested DCE subsets is completed.
=====

Configuring "DCE Cell Directory Server V4.1" (DCECDS410) on member1

=====
Installation of all the requested DCE subsets is completed.
=====

Configuring "DCE Application Developers Kit V4.1" (DCEADK410) on member1

Creating local DCE File Links (member1)

=====
Installation of all the requested DCE subsets is completed.
=====

Configuring "DCE Command Reference Manual Pages V4.1" (DCEMAN410) on member1

Creating local DCE File Links (member1)

```
=====  
Installation of all the requested DCE subsets is completed.  
=====
```

```
Configuring "DCE Application Developers Manual Pages V4.1" (DCEADKMAN410)  
on member1
```

```
Creating local DCE File Links      (member1)
```

```
=====  
Installation of all the requested DCE subsets is completed.  
=====
```

- To verify that the subsets you selected have been installed, enter the following command:

```
# setld -i | grep DCE | grep "_installed"
```

- Be sure the old subset (kit) is deleted (*see page 24*)

1.12 Installing DFS

The initial steps resemble those in Section 1.7. The following introductory information was added:

Be sure that DCE Runtime (DCERTTS410) is installed prior to, or at the same time as, the DFS subsets. Installing DFS subsets later is similar to the original installation of DCE. But, for configuration, use `dfssetup` instead of `dcsetup`. See *Gradient DCE for Tru64 UNIX Distributed File Service (DFS) Configuration Guide*.

NOTE: For cluster installations, the installation scripts first install the common files to shared cluster locations, then to the member template area (member 0), and then onto each of the members in member specific locations. Configuration does not begin until all the installations are complete.

STEPS

- 1 Log in as superuser (login name **root**) to the system on which you are installing the DCE software.

- 2 You can load the subsets in the DCE software either by changing directories to where the software is placed, then entering the `setld` command OR you can enter the `setld` command followed by the location where the software is placed, as in the following examples:

```
# cd <kit_location>
```

```
# setld -l
```

If you mounted the DCE CDROM on the `/mnt/` directory, then the kit location is `/mnt/kit`.

OR

```
# setld -l <kit_location>
```

```
# setld -l /mnt/kit
```

After several seconds, the installation procedure displays the names of the optional subsets and prompts you to specify the subsets that you want to install.

The subsets listed below are optional:

There may be more optional subsets than can be presented on a single screen. If this is the case, you can choose subsets screen by screen or all at once on the last screen. All of the choices you make will be collected for your confirmation before any subsets are installed.

- 1) DCE DFS Base V4.1
- 2) DCE DFS Kernel Binaries V4.1
- 3) DCE DFS Man Pages V4.1
- 4) DCE DFS NFS-DFS Secure Gateway Server V4.1
- 5) DCE DFS Utilities/Debug V4.1

Or you may choose one of the following options:

- 6) ALL of the above
- 7) CANCEL selections and redisplay menus
- 8) EXIT without installing any subsets

Estimated free disk space(MB) in root:285.6 usr:275.6 var:1102.8

Enter your choices or press RETURN to redisplay menus.

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6):1-5

Choose the DFS subsets: 1-5

- 1) DCE DFS Base V4.1
 - 2) DCE DFS Kernel Binaries V4.1
 - 3) DCE DFS Man Pages V4.1
 - 4) DCE DFS NFS-DFS Secure Gateway Server V4.1
 - 5) DCE DFS Utilities/Debug V4.1
- 3 Next, the installation procedure lets you verify your choice. You see the following display:

You are installing the following optional subsets:

```
DCE DFS Base V4.1
DCE DFS Kernel Binaries V4.1
DCE DFS Man Pages V4.1
DCE DFS NFS-DFS Secure Gateway Server V4.1
DCE DFS Utilities/Debug V4.1
```

Estimated free disk space(MB) in root: 285.6 usr: 246.8 var: 1102.8

Is this correct? (y/n):

Checking file system space required to install selected subsets:

File system space checked OK.

5 subsets will be installed.

Loading subset 1 of 5 ...

```
DCE DFS Base V4.1
  Copying from . (disk)
  Verifying
```

Loading subset 2 of 5 ...

```
DCE DFS Kernel Binaries V4.1
  Copying from . (disk)
  Verifying
```

Loading subset 3 of 5 ...

DCE DFS Utilities/Debug V4.1

Copying from . (disk)

Verifying

Loading subset 4 of 5 ...

DCE DFS Man Pages V4.1

Copying from . (disk)

Verifying

Loading subset 5 of 5 ...

DCE DFS NFS-DFS Secure Gateway Server V4.1

Copying from . (disk)

Verifying

5 of 5 subsets installed successfully.

Creating DCE File Links

Configuring "DCE DFS Base V4.1" (DCEDFS410) on member0

Creating local DCE File Links (member1)

Installation of the DCE DFS Base V4.1 (DCEDFS410)
subset is complete.

Modifying /sys/conf/files due to change in Tru64 UNIX V5.0 configuration.

Configuring "DCE DFS Kernel Binaries V4.1" (DCEDFSBIN410) on member0

Installation of the DCE DFS Kernel Binaries V4.1 (DCEDFSBIN410)
subset is complete.

To configure DFS services, you must first build a DFS kernel. Type 'doconfig' and choose the DCEDFS kernel option from the menu (along with

any others you desire). Copy the resulting kernel to /vminix, reboot, then run '/usr/sbin/dfssetup' to configure DFS, if necessary.

Creating DCE File Links

Configuring "DCE DFS Utilities/Debug V4.1" (DCEDFSUTL410) on member0

Creating local DCE File Links (member1)

Installation of the DCE DFS Utilities/Debug V4.1 (DCEDFSUTL410) subset is complete.

Creating DCE File Links

Configuring "DCE DFS Man Pages V4.1" (DCEDFSMAN410) on member0

Creating local DCE File Links (member1)

Installation of the DCE/DFS Man Pages V4.1 (DCEDFSMAN410) subset is complete.

Creating DCE File Links

Configuring "DCE DFS NFS-DFS Secure Gateway Server V4.1" (DCEDFSNFSSRV410) on member0

Installation of the DCE DFS NFS-DFS Secure Gateway Server V4.1 (DCEDFSNFSSRV410) subset is complete.

=====
Installation of all the requested DCE subsets is completed.

You have installed the DCE software which requires further action to configure and start it. To do so please invoke "/usr/sbin/dcesetup" and select option 1 (Configure DCE services) from the main menu.

=====
Configuring "DCE DFS Base V4.1" (DCEDFS410) on member1

Creating local DCE File Links (member1)

Installation of the DCE DFS Base V4.1 (DCEDFS410)
subset is complete.

=====
Installation of all the requested DCE subsets is completed.
=====

Configuring "DCE DFS Kernel Binaries V4.1" (DCEDFSBIN410) on member1

Installation of the DCE DFS Kernel Binaries V4.1 (DCEDFSBIN410)
subset is complete.

To configure DFS services, you must first build a DFS kernel. Type 'doconfig' and choose the DCEDFS kernel option from the menu (along with any others you desire). Copy the resulting kernel to /vmunix, reboot, then run '/usr/sbin/dfssetup' to configure DFS, if necessary.

=====
Installation of all the requested DCE subsets is completed.
=====

Configuring "DCE DFS Utilities/Debug V4.1" (DCEDFSUTL410) on member1

Creating local DCE File Links (member1)

Installation of the DCE DFS Utilities/Debug V4.1 (DCEDFSUTL410)
subset is complete.

=====
Installation of all the requested DCE subsets is completed.
=====

Configuring "DCE DFS Man Pages V4.1" (DCEDFSMAN410) on member1

Creating local DCE File Links (member1)

Installation of the DCE/DFS Man Pages V4.1 (DCEDFSMAN410)
subset is complete.

=====
Installation of all the requested DCE subsets is completed.
=====

Configuring "DCE DFS NFS-DFS Secure Gateway Server V4.1"
(DCEDFSNFSSRV410) on member1

Installation of the DCE DFS NFS-DFS Secure Gateway Server V4.1
(DCEDFSNFSSRV410)
subset is complete.

=====
Installation of all the requested DCE subsets is completed.
=====

At this point, the installation is completed. However a new DFS kernel
must be created and the DFS must be configured before DFS can be
utilized.

- 4 To configure DFS services, you must first build a DFS kernel.
 - Type the **'doconfig'** command and choose the DCEDFS kernel option from the menu (along with any others you desire).
 - Copy the resulting kernel to /vmunix,
 - Reboot, using the new kernel,

- 5 Run `/usr/sbin/dfssetup` to configure DFS.

(Remember that DCE had to have been configured before installing DFS.)

Procedures to configure DFS are explained in *Net Crusader Distributed File Service (DFS) Configuration Guide*.

DFS databases are preserved from one version to another; if you did not recreate the `dcelocal` directory during installation of the DCE Runtime Services Kit. Choice is explained at *Chapter 1.11 on page 28*

1.13 Installing DCE in a DMS Environment

Dataless Management System (DMS) is not supported in a clustered environment, but works in a non-clustered environment. Gradient DCE for Tru64 UNIX versions 4.0 and 4.1 support DMS in that non clustered environment.

Gradient DCE for Tru64 UNIX 4.1 allows you to install DCE on a Dataless Management System client. For detailed information on DMS, see the section on Dataless Management Services in the Tru64 UNIX *System & Network Management Guide*; the DMS section is in the chapter, “Sharing Software on a Local Area Network.”

1.13.1 Hardware Requirements for a DMS Installation

Hardware requirements are the same as those for a regular DCE installation, listed on *Section 1.3.1 on page 11*.

1.13.2 Software Requirements

To install DCE in a DMS environment, you must have the base Tru64 UNIX Operating System plus the following optional subsets installed:

Required by DMS:

- OSFINET Additional Networking Services
- OSFDMS Dataless Management Services

Required by DCE:

- OSFINCLUDE Standard Header Files
- OSFDCMT Documentation Preparation Tools
- OSFPGMR Standard Programmer Commands

1.13.3 Installation Instructions

- 1 If this is a first-time installation, create the DMS environment using the DMU tool by installing the base Tru64 UNIX operating system plus the optional subsets required by DCE. (These are listed in the previous

section.) If this is an update installation and you want to preserve the DMS client system's DCE database, refer to *Section 1.5 on page 13* before attempting the installation.

- 2 Using the DMU tool, run the following option:
CONFIGURE software environments
This option sets up directories in the DMS environment that are required for successful installation of DCE.
- 3 Install the DCE product into the DMS environment using the following DMU option:
 - i) INSTALL software environments
Remember that you must not choose **/usr** as the location for the DCE database, because DMS mounts **/usr** as a read-only partition for the client.
- 4 Create your DMS client(s) using the following DMU option:
 - a) ADD a client
- 5 You should now be able to boot the client system(s) and complete the configuration phase of the installation on the client. At this time, you are asked whether you want to mount the DCE database on a local partition (on the DMS client), rather than keeping it on an NFS mounted partition. Since DCE assumes "local filesystem security," you must mount the DCE database on the DMS client unless security is not a concern. If security is not an issue, you can leave the DCE database on an NFS mounted partition. For more information, see *Section 1.15 on page 55*.
- 6 Add all the licenses required for Tru64 UNIX and DCE to the client.
- 7 Configure DCE on the DMS client using `dcesetup`. It is assumed that DMS clients will be configured as DCE clients. Although it is possible to configure a DMS client system as a DCE server, this is not recommended.

1.13.4 Sample DMU Session: Installing DCE into a Client Environment

The following is a sample script from a DMU session showing the installation of DCE into a client environment. All user entries appear in boldface type.

```
:/alt> dmu
```

```
*** DMU Main Menu ***
```

Choices without key letters are not available.

- a) ADD a client
- c) CONFIGURE software environments
- d) DELETE software environments
- i) INSTALL software environments
-) LIST registered clients
-) MODIFY a client

-) REMOVE a client
- s) SHOW software environments
- x) EXIT

Enter your choice: **i**

DMU Software Installation Menu:

- 1) Install software into a new area
- 2) Add software into an existing area
- 3) Perform configuration phase on an existing area
- 4) Return to previous menu

Enter your choice: **2**

You have chosen to add a product to an existing environment.

The existing environment is /alt/dms/dms0.alpha.

Enter the device special file name or the path of the directory where the software is located (for example, /mnt/ALPHA/BASE): **/mnt/ALPHA/BASE**

The subsets listed below are optional:

There may be more optional subsets than can be presented on a single screen. If this is the case, you can choose subsets screen by screen or all at once on the last screen. All of the choices you make will be collected for your confirmation before any subsets are installed.

- 1) DCE Application Developers Kit V4.1
- 2) DCE Application Developers Manual Pages V4.1
- 3) DCE Cell Directory Server V4.1
- 4) DCE Command Reference Manual Pages V4.1
- 5) DCE DFS Base V4.1
- 6) DCE DFS Kernel Binaries V4.1
- 7) DCE DFS Man Pages V4.1
- 8) DCE DFS NFS-DFS Secure Gateway Server V4.1
- 9) DCE DFS Utilities/Debug V4.1
- 10) DCE Runtime Services V4.1
- 11) DCE Security Server V4.1

--- MORE TO FOLLOW ---

Enter your choices or press RETURN to display the next screen.

Choices (for example, 1 2 4-6):

Or you may choose one of the following options:

- 12) ALL of the above
- 13) CANCEL selections and redisplay menus
- 14) EXIT without installing any subsets

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6): **12**

You are installing the following optional subsets:

- DCE Application Developers Kit V4.1
- DCE Application Developers Manual Pages V4.1
- DCE Cell Directory Server V4.1
- DCE Command Reference Manual Pages V4.1
- DCE DFS Base V4.1
- DCE DFS Kernel Binaries V4.1
- DCE DFS Man Pages V4.1
- DCE DFS NFS-DFS Secure Gateway Server V4.1
- DCE DFS Utilities/Debug V4.1
- DCE Runtime Services V4.1
- DCE Security Server V4.1

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

Checking file system space required to install selected subsets:

File system space checked OK.

11 subset(s) will be installed.

Loading 1 of 11 subset(s)....

DCE Runtime Services V4.1

- Copying from /DCE410_kit (disk)
- Working... Thu Oct 1 08:37:47 EDT 2000
- Verifying
- Working... Thu Oct 1 08:38:35 EDT 2000

Loading 2 of 11 subset(s)....

DCE Security Server V4.1
Copying from /DCE410_kit (disk)
Verifying

Loading 3 of 11 subset(s)....

DCE Cell Directory Server V4.1
Copying from /DCE410_kit (disk)
Verifying

Loading 4 of 11 subset(s)....

DCE Application Developers Kit V4.1
Copying from /DCE410_kit (disk)
Verifying

Loading 5 of 11 subset(s)....

DCE Command Reference Manual Pages V4.1
Copying from /DCE410_kit (disk)
Verifying

Loading 6 of 11 subset(s)....

DCE Application Developers Manual Pages V4.1
Copying from /DCE410_kit (disk)
Working... Thu Oct 1 08:39:35 EDT 2000
Verifying

Loading 7 of 11 subset(s)....

DCE DFS Base V4.1
Copying from /DCE410_kit (disk)
Verifying

Loading 8 of 11 subset(s)....

DCE DFS Kernel Binaries V4.1
Copying from /DCE410_kit (disk)
Verifying

Loading 9 of 11 subset(s)....

DCE DFS Utilities/Debug V4.1
Copying from /DCE410_kit (disk)
Verifying

Loading 10 of 11 subset(s)....

DCE DFS Man Pages V4.1
Copying from /DCE410_kit (disk)
Verifying

Loading 11 of 11 subset(s)....

DCE DFS NFS-DFS Secure Gateway Server V4.1
Copying from /DCE410_kit (disk)
Verifying

11 of 11 subset(s) installed successfully.

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=====

Beginning configuration of DCE Version 4.1.

You will be asked a few questions before configuration can proceed.

On-line help is available where the prompt contains a "?" choice.

=====

IMPORTANT:

For SECURITY reasons, you may want to make sure that the location you will
type now is native to this host; i.e., is not NFS mounted!

Please enter the location for new DCE local databases, or press <RETURN>
for the default location [/var]: **/var**

=====

There will be no more questions asked for the remainder of the
configuration.

```
=====
Creating DCE local directory structure
Removing old DCE local databases as directed.
Created new DCE local database directory /opt/dcelocal
Creating DCE File Links
Adding DCE Setup desktop icon
```

```
Creating DCE File Links
```

Use the DMU Main Menu to create a client.

```
:/alt> dnu
*** DMU Main Menu ***
```

Choices without key letters are not available.

- a) ADD a client
- c) CONFIGURE software environments
- d) DELETE software environments
- i) INSTALL software environments
-) LIST registered clients
-) MODIFY a client
-) REMOVE a client
- s) SHOW software environments
- x) EXIT

Enter your choice: a

You have chosen to add a client for dataless service.

The following conditions must be met to add a client:

1. You must know the client processor's hostname.
2. The client's hostname must be in your system's host database(s)
3. You must know the client's interface type and subnet mask.

4. You must know the type of kernel build area.
5. You must know the swap device and partition on the client.
6. You must know the client's hardware Ethernet or FDDI address.
7. If the client and server reside on different subnets, you will need the address of the gateway(s) that the client can use to communicate with the server.

Do you want to continue? (y/n) [y]:

Enter the client processor's hostname or press RETURN to quit: **myhost**

Enter the path to contain the root file system [/clients/myhost]:

Enter the swap device and partition on myhost. [rz0b]: **rz11g**

Enter the swap device drive type for rz11g. [RZ26]: **rz56**

Enter the network interface for myhost (16.32.40.20). [ln0]:

Enter the subnet mask for ln0. [255.255.255.0]: **255.255.0.0**

Enter the type of kernel build area for myhost.

You may select [F]ull, [P]artial, [N]one or [H]elp for more information. [P]:

You have specified the following configuration for myhost:

```
    ROOT: /clients/myhost
SWAP_DEVICE: /dev/rz11g
  SWAP_TYPE: RZ56
  BUILD_TYPE: Partial
  INTERFACE: ln0 (16.32.40.20)
SUBNET_MASK: 255.255.0.0
```

Is this correct? (y/n) [y]:

The existing environment is /alt/dms/dms0.alpha.

The following environment will be installed from /alt/dms/dms0.alpha:

Description

```
'Digital DCE V4.1 for Digital UNIX DCEADK410'
'Digital DCE V4.1 for Digital UNIX DCEADKMAN410'
'Digital DCE V4.1 for Digital UNIX DCECDS410'
'Digital DCE V4.1 for Digital UNIX DCEDFS410'
'Digital DCE V4.1 for Digital UNIX DCEDFSBIN410'
```

```
'Digital DCE V4.1 for Digital UNIX DCEDFSMAN410'
'Digital DCE V4.1 for Digital UNIX DCEDFSNFSSRV410'
'Digital DCE V4.1 for Digital UNIX DCEDFSUTL410'
'Digital DCE V4.1 for Digital UNIX DCEMAN410'
'Digital DCE V4.1 for Digital UNIX DCERTS410'
'Digital DCE V4.1 for Digital UNIX DCESEC410'
'Digital UNIX V4.1 Operating System (Rev 375)'
```

Is that correct? (y/n) [y]:

Enter the client processor's hardware network address. For example,
08-00-2b-02-67-e1: 08-00-2b-2c-32-05

Checking file system space required for client root and var file
systems...done.

Creating the root and var filesystems for myhost.

Working... Thu Oct 1 08:45:05 EDT 2000

Working... Thu Oct 1 08:47:06 EDT 2000

Client myhost has been added.

You can use the DMU Main Menu to obtain information about the preceding
operation.

*** DMU Main Menu ***

- a) ADD a client
- c) CONFIGURE software environments
- d) DELETE software environments
- i) INSTALL software environments
- l) LIST registered clients
- m) MODIFY a client
- r) REMOVE a client
- s) SHOW software environments
- x) EXIT

Enter your choice: s

1 /alt/dms/dms0.alpha

```
'Digital DCE V4.1 for Digital UNIX DCEADK410'
'Digital DCE V4.1 for Digital UNIX DCEADKMAN410'
'Digital DCE V4.1 for Digital UNIX DCECDS410'
'Digital DCE V4.1 for Digital UNIX DCEDFS410'
'Digital DCE V4.1 for Digital UNIX DCEDFSBIN410'
'Digital DCE V4.1 for Digital UNIX DCEDFSMAN410'
'Digital DCE V4.1 for Digital UNIX DCEDFSNFSSRV410'
'Digital DCE V4.1 for Digital UNIX DCEDFSUTL410'
'Digital DCE V4.1 for Digital UNIX DCEMAN410'
```

```
'Digital DCE V4.1 for Digital UNIX DCERTS410'  
'Digital DCE V4.1 for Digital UNIX DCESEC410'  
'Digital UNIX V4.1410 Operating System (Rev 375)'
```

*** DMU Main Menu ***

- a) ADD a client
- c) CONFIGURE software environments
- d) DELETE software environments
- i) INSTALL software environments
- l) LIST registered clients
- m) MODIFY a client
- r) REMOVE a client
- s) SHOW software environments
- x) EXIT

Enter your choice: **l**

The following clients are registered for /alt/dms/dms0.alpha:
myhost

After exiting from the DMU session, the next step is to boot the client and perform client configuration.

The following is a sample of output from booting the DMS client system:

```
>>>boot ez0
```

```
*** SYSTEM CONFIGURATION ***
```

```
Configuring "Base System " (OSFBASE425)  
Configuring "Base System - Hardware Support " (OSFHWBASE425)  
Configuring "Compiler Back End " (OSFCMLRS425)  
Configuring "Kernel Header and Common Files " (OSFBINCOM425)  
Configuring "Standard Kernel Modules " (OSFBIN425)  
Configuring "Hardware Kernel Header and Common Files" (OSFHWBINCOM425)  
Configuring "Hardware Kernel Modules " (OSFHWBIN425)  
Configuring "Basic Networking Services " (OSFCLINET425)  
Configuring "NFS(tm) Utilities " (OSFNFS425)  
Configuring "Local Printer Support " (OSFPRINT425)  
Configuring "Basic X Environment " (OSFX11425)  
Configuring "CDE Minimum Runtime Environment " (OSFCDEM425)  
Configuring "CDE Desktop Environment " (OSFCDEDT425)
```

```
Configuring "LK201 Keyboard Support " (OSFKBDLK201425)
Configuring "LK401 Keyboard Support " (OSFKBDLK401425)
Configuring "LK411 Keyboard Support " (OSFKBDLK411425)
Configuring "LK421 Keyboard Support " (OSFKBDLK421425)
Configuring "LK444 Keyboard Support " (OSFKBDLK444425)
Configuring "PCXAL Keyboard Support " (OSFKBDPCXAL425)
Configuring "X Servers Base " (OSFSER425)
Configuring "X Servers for PCbus " (OSFSERPC425)
Configuring "X Servers for TurboChannel " (OSFSERTC425)
Configuring "X Servers for Open3D " (OSFSER3D425)
Configuring "X Fonts " (OSFM TFONT425)
Configuring "DECwindows 100dpi Fonts " (OSFFONT15425)
Configuring "DECwindows 75dpi Fonts " (OSFFONT425)
Configuring "Adobe Fonts " (OSFDPSFONT425)
Configuring "Old X Environment " (OSFOLDX11425)
Configuring "CDE Mail Interface " (OSFCDEMAIL425)
Configuring "Tcl Commands " (OSFTCLBASE425)
Configuring "Tk Toolkit Commands " (OSFTKBASE425)
Configuring "Java V1.1.4 Environment " (OSFJAVA425)
Configuring "Netscape Navigator Gold V3.04 " (OSFNETSCAPE425)
Configuring "Base System Management Applications and Utilities"
(OSFSYSMAN425)
Configuring "Basic Networking Configuration Applications" (OSFNETCONF425)
Configuring "NFS(tm) Configuration Application " (OSFNFSCONF425)
Configuring "Graphical Base System Management Utilities" (OSFXSYSMAN425)
Configuring "Graphical System Administration Utilities" (OSFXADMIN425)
Configuring "Graphical Print Configuration Application" (OSFXPRINT425)
Configuring "Additional Networking Services " (OSFINET425)
Configuring "Dataless Management Services " (OSFDMS425)
Configuring "Doc. Preparation Tools " (OSFDCM425)
Configuring "Doc. Preparation Tools Extensions " (OSFDCMTEXT425)
Configuring "Standard Programmer Commands " (OSFPGMR425)
Configuring "Standard Header Files " (OSFINCLUDE425)
Configuring "DCE Runtime Services V4.1" (DCERTS410)
```

```
This appears to be a DMS installation.
Is this a DMS installation? (y/n/?) [y]:
```

You are installing DCE on a DMS client system

DMS assumes that all partitions other than swap are NFS mounted from the DMS server system.

Digital STRONGLY recommends that you do not use an NFS mounted directory to store DCE data - DCE security relies on 'local filesystem' security to maintain the integrity of the DCE database.

You will now be given the option of mounting dcelocal on a partition residing on the DMS client system. If you choose to keep DCE databases mounted on the DMS server, the security of your DCE database may be compromised.

You may mount dcelocal on a partition residing on the DMS client system at a later time if you wish. See the instructions in the DCE Installation and Configuration Guide entitled "Mounting a local partition for DCE in the DMS Environment"

Please note that any data currently on the local partition will be lost.

Do you wish to mount a local filesystem to hold the DCE database at this time? (y/n/?) [y]: n

Configuring "DCE Security Server V4.1" (DCESEC410)

DCESEC410 includes support for the License Management Facility.

A Product Authorization Key (PAK) is necessary for the use of this product.

For information on registering and activating the PAK, refer to the DCE Installation and Configuration Guide or Guide to Software Licensing

*** WARNING: myhost doesn't have proper license for DCESEC410. ***

*** WARNING: Install correct PAK before running dcesetup. ***

Configuring "DCE Cell Directory Server V4.1" (DCECDS410)

DCECDS410 includes support for the License Management Facility.

A Product Authorization Key (PAK) is necessary for the use of this product.

For information on registering and activating the PAK, refer to the DCE Installation and Configuration Guide or Guide to Software Licensing

*** WARNING: myhost doesn't have proper license for DCECDS410. ***

*** WARNING: Install correct PAK before running dcesetup. ***

Configuring "DCE Application Developers Kit V4.1" (DCEADK410)

DCEADK410 includes support for the License Management Facility.

A Product Authorization Key (PAK) is necessary for the use of this product.

For information on registering and activating the PAK, refer to the DCE Installation and Configuration Guide or Guide to Software Licensing

*** WARNING: myhost doesn't have proper license for DCEADK410. ***

*** WARNING: Install correct PAK before running dcesetup. ***

Configuring "DCE Command Reference Manual Pages V4.1" (DCEMAN410)

Configuring "DCE Application Developers Manual Pages V4.1" (DCEADKMAN410)

Configuring "DCE DFS Base V4.1" (DCEDFS410)

Installation of the DCE DFS Base V4.1 (DCEDFS410) subset is complete.

Configuring "DCE DFS Kernel Binaries V4.1" (DCEDFSBIN410)

Installation of the DCE DFS Kernel Binaries V4.1 (DCEDFSBIN410) subset is complete.

To configure DFS services, you must first build a DFS kernel. Type 'doconfig' and choose the DCEDFS kernel option from the menu (along with any others you desire). Copy the resulting kernel to /vmunix, reboot, then run '/usr/sbin/dfssetup' to configure DFS, if necessary.

Configuring "DCE DFS Utilities/Debug V4.1" (DCEDFSUTL410)

Installation of the DCE DFS Utilities/Debug V4.1 (DCEDFSUTL410) subset is complete.

Configuring "DCE DFS Man Pages V4.1" (DCEDFSMAN410)

Installation of the DCE/DFS Man Pages V4.1 (DCEDFSMAN410) subset is complete.

Configuring "DCE DFS NFS-DFS Secure Gateway Server V4.1" (DCEDFSNFSSRV410)

Installation of the DCE DFS NFS-DFS Secure Gateway Server V4.1 (DCEDFSNFSSRV410) subset is complete.

=====
Installation of all the requested DCE subsets is completed.

You have installed the DCE software which requires further action to configure and start it. To do so please invoke "/usr/sbin/dcesetup" and select option 1 (Configure DCE services) from the main menu.

=====

1.14 Re-Installing DCE in a DMS Environment over an Older Version of DCE

Because the DMS software installation process cannot identify where the DCE database resides on a client system, special processing is required if you want to retain your DMS client's DCE database when you upgrade software in the DMS environment. The following section presents the procedure that is required to preserve a DCE database for a DMS client system.

Before upgrading software, log in to each DMS client system and perform the following steps, where *SYSTEM_NAME* is the name of the DMS client :

- 1 Stop the DCE daemons that are running on the client:
`dcesetup stop`
- 2 Perform a Clean operation from DCEsetup on the client:
`dcesetup clean`
- 3 Change the directory to the local DCE area with the command :
`cd /opt/dcelocal`
- 4 Create a tar file of the DCE area with the following command:
`tar cvf /SYSTEM_NAME_dcedb.tar`
- 5 Create a list of files in the DCE area with the command :
`find . > /SYSTEM_NAME_dcedb_before.dif`
- 6 Change the directory to the **/krb5** directory with the command :
`cd /krb5`
- 7 Create a tar file of the **/krb5** directory with the command :
`tar cvf /SYSTEM_NAME_krb5db.tar ./`
- 8 Move the files */SYSTEM_NAME_dcedb.tar*, */SYSTEM_NAME_krb5db.tar*, and */SYSTEM_NAME_dcedb_before.dif* to a safe place on the server.

NOTE: Do NOT store these files in the DMS **/clients** or **/dmsN.alpha** areas; if you do, they may be deleted during the upgrade.)

Next, install the software in the DMS environment. This requires that you delete and recreate each client.

Boot the client systems and complete the installation and configuration passes, but do NOT run dcesetup.

Log in to each client and perform the following steps, where *SYSTEM_NAME* is the name of the DMS client:

- 9 Copy *SYSTEM_NAME_dcedb.tar*, *SYSTEM_NAME_krb5db.tar*, and *SYSTEM_NAME_dcedb_before.dif* to the client's / (root) directory.
- 10 Change directories to the local DCE area with the command:
`cd /opt/dcelocal`

- 11 Create a list of files in the area with the command:

```
find . > /SYSTEM_NAME_dcedb_after.dif
```

- 12 With the following command, create a list of files to be extracted from the tar file created from the original DCE database:

```
diff /SYSTEM_NAME_dcedb_after.dif \  
/SYSTEM_NAME_dcedb_before.dif | grep ">" | \  
awk '{print $2}' > /dcedb_extract.lis
```

- 13 Do the extraction from the tar files as follows :

```
tar -xvf /SYSTEM_NAME_dcedb.tar -R /dcedb_extract.lis
```

- 14 Change the directory to **/krb5** with the command :

```
cd /krb5
```

- 15 Do the extraction from the **krb5** tar file as follows:

```
tar -xvf /SYSTEM_NAME_krb5db.tar
```

You should now have an upgraded version of the DCE software with the original DCE database in place. After testing is complete, you can delete the following files:

```
/SYSTEM_NAME_dcedb.tar, /SYSTEM_NAME_dcedb_before.dif,  
/SYSTEM_NAME_dcedb_after.dif, and /dcedb_extract.lis
```

1.15 Mounting a Local Partition for DCE in the DMS Environment

To mount a local partition for DCE in the DMS Environment, perform the steps in the following example. Substitute the name of your local partition for *rz3g* wherever *rz3g* appears.

- 1 Find a local partition on the DMS client system. To obtain a list of disk partitions available on the DMS client, enter the following command:

```
ls /dev/rz*
```

- 2 Create a mount point for the local partition with the following:

```
mkdir /dcedms
```

- 3 Create a disklabel for the disk/partition:

```
disklabel -s -F rz3g unused
```

- 4 Create a new file system on the local partition (note that this command erases ALL data currently on that partition):

```
newfs -F /dev/rz3g
```

- 5 Just to be sure, perform an **fsck** on the partition:

```
fsck /dev/rz3g
```

- 6 Mount the local partition for read/write:

```
mount -w /dev/rz3g /dcedms
```

- 7 Identify the actual location of the DCE database by following the softlink from /opt/dcelocal :

```
ls -l /opt/dcelocal
```

The output returned is similar to the following:

```
lrwxrwxrwx 1 root system 13 Aug 27 11:15 /opt/dcelocal -> /var/dcelocal
```

The actual location in this case is **/var/dcelocal**.

- 8 Copy the DCE database from the NFS mounted partition (in this example, /var/dcelocal) to the local partition:

```
cp -R -p /var/dcelocal /dcedms
```

- 9 If the copy was successful, remove the old DCE database from the NFS mounted partition (in this example, /var/dcelocal):

```
rm -r /var/dcelocal
```

- 10 Create a softlink from the old NFS mounted dcelocal (/var/dcelocal in this example) to the new dcelocal area on the client system:

```
ln -s /dcedms/dcelocal /var/dcelocal
```

- 11 Modify the **/etc/fstab** file on the client system so that the local DCE database is automatically mounted on a client reboot by adding the following line to **/etc/fstab** (*rz3g* is the local partition in this example):

```
' /dev/rz3g    /dcedms ufs    rw 1 2
```

CHAPTER 2

How to Configure a DCE Cell



2.1 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 with 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 that cell.

2.1.1 TruCluster, Sierra Cluster and Cells

Compaq's Tru Cluster and Sierra Cluster run on Compaq's Tru64 UNIX v5.1. Though there were versions of TruCluster for 5.0 and 5.0a, Entegrity began using and supporting v5.1.

A cluster is a group of up to 32 machines that work together based on the TruCluster's "Memory Channel" interconnect. A Sierra Cluster connects up to 128 machines using a "Qswitch". On both, the member machines share the Cluster File System (CFS). On Sierra Clusters, members share the Parallel File System (PFS) as well.

Clusters and cells connect computers for different reasons. A cluster is a group of computers that share disk and memory subsystems and appear to the outside world as one computer. Unlike DCE clients, cluster members need to be on similar machines from the same manufacturer. A DCE cell is a group of computers that uses a network to communicate in a secure manner to each other.

All machines in one cluster are configured to the same DCE cell.

Entegrity's version 4.1 is designed to work with clusters:

- Several directories and files need to be member-specific on a TruCluster installation. The following need to be member-specific:

```
/opt/dcelocal  
/krb5  
/etc/sia  
/etc/krb5.conf
```

The installation scripts generate Context Dependent Sensitive Links. These CDSLs are symbolic pointers, indicating a member specific configuration in a cluster. Each member (or node or machine) is a DCE client, so in a cluster directory there are member specific pointers.

- V4.1 supports generating forward credentials for DCE-enabled SIA, to provide consistent credentials between cluster members.
- Configuration scripts, `dcesetup` and `dfssetup`, are cluster aware.

The scripts allow for one time DCE client configuration of all cluster members, as DCE clients using the same configuration information.

For Sierra Clusters, only cluster members that share the same sub-cluster and CFS file system can be configured at the same time. One will have to run `dcesetup` for each of the subclusters.

2.1.2 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.

2.1.3 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.

2.1.4 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 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 DIGITAL X.500 Base kit and the DIGITAL X.500 API kit is installed on your CDS server. It is also recommended X.500 administration subset (DXDADXIM) be installed. Optionally, you can install the DIGITAL X.500 Administration Facility kit for debugging and general administrative support.

Entegrity recommends that you use the following convention to create DCE cell names: the Internet name of your host system followed by the suffix **_cell**, and then 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 name 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 this convention is followed by all DCE users in your network, 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**.

2.1.5 Defining a Hostname

You need to define a name for your system that is unique within your DCE cell. You should use the default hostname, which is the Internet hostname (the name specified before the first dot (.)).

The following example shows the default hostname derived from the Internet name of **myhost.mycompany.com**.

Please enter your DCE host name [myhost]:

2.1.6 Intercell Naming

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, called **/etc/namedb/hosts.db**. The data file is used by the BIND name daemon (**named**). 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_cell.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_cell.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 **/etc/namedb/hosts.db** file:

```
alo010.axpnio.dec.com IN A 25.0.0.149
ruby_cell.axpnio.dec.com IN MX 1 alo010.axpnio.dec.com
ruby_cell.axpnio.dec.com IN TXT "1 c8f5f807-487c-11cc-b499- \
08002b32b0ee
Master /.../ruby_cell.axpnio.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 four 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 hostname 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_cell.axpni0.dec.com** text record (TXT), you would go to a host in the **ruby_cell** 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, issue a **kill -1 <named-process-id>** command, which causes the **named** daemon to read in the new **hosts.db** file. Next, execute the following **nslookup** command to obtain the host address:

```
alo001.axpni0.dec.com> nslookup hostname
```

```
Server:   named.yourcompany.com
```

```
Address:  21.222.0.10
```

```
Name:     hostname.yourcompany.com
```

```
Address:  21.222.0.4
```

2.2 Using the dcesetup Utility

The **dcesetup** command begins the configuration program. The default responses to prompts in the configuration procedure are based on your existing configuration, if you have one. Otherwise, defaults appropriate 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.

After you install the DCE software, it displays the following message, prompting you to begin the configuration procedure:

```
You have installed the DCE software which requires further action to
configure and start it. To do so please invoke "/usr/sbin/dcesetup" and
select option 1 (Configure DCE services) from the main menu.  from the main
menu.
```

You must be logged in as **root** to configure your DCE system. When you invoke **dcesetup**, the DCE Setup Main Menu appears.

```
# /usr/sbin/dcesetup
```

```
or if already at usr/bin/ just
```

```
# dcesetup
```

```
*** DCE Setup Main Menu ***
```

Version V4.1 (Rev. 1381)

- 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) CVP Run Configuration Verification Program
- 9) Version Show DCE Version number
- X) Exit

Please enter your selection:

NOTE: If you will be creating a new cell or adding a CDS server, choose option 3 (Terminate all active DCE daemons) 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 already been done.

Choose option 1 (Configure DCE services on this system), to view the Configuration Choice Menu.

*** Configuration Choice Menu ***

- 1) Configure this system as a DCE Client
- 2) Create a new DCE cell
- 3) Add Master CDS Server
- 4) Configure DCE Distributed File Service (DFS)
- 5) Modify DCE cell configuration
- 6) Configure this system for RPC only
- 7) Configure DCE in TruCluster
- R) Return to previous menu

Please enter your selection (or '?' for help): 1

For information on how to configure a DCE cell or add a client, see *Chapter 3, "Configuring the DCE Environment."* For information on modifying an existing configuration, see *Chapter 4, "Modifying Cell Configuration."*

2.3 Configuring LDAP, NSI, and GDA

The Lightweight Directory Access Protocol (LDAP) provides access to the X.500 directory service 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 *de facto* 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 runtime 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: Gradient DCE for Tru64 UNIX does not automatically install LDAP. Prior to installing DCE, a DCE administrator must obtain LDAP 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.

2.4 Kerberos 5 Security for telnet, rlogin, rsh, ftp

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 Gradient DCE for Tru64 UNIX privilege server is passed in the Kerberos 5 ticket's authorization field.

2.4.1 Kerberized Network Tools

Communication with remote machines across a network creates risks. A very major risk is to the security of passwords. Transmitting a user's password in clear text can compromise an account. It allows unauthorized individuals to intercept the packets on the network.

The Kerberized network tools, rsh, telnet, rlogin, and ftp are set up to prevent the risk of interception. Security is achieved through a standard client-server authentication protocol implemented in the **telnet** and **telnetd** processes. This protocol is extensively outlined in RFC 1510 with its application to the telnet protocol outlined in RFC 1416.

The Kerberos authentication protocol is employed to mutually authenticate the client and server as follows:

A user sends a request to the authentication server (AS) requesting “credentials” via the `dce_login` process. The AS provides these credentials in the form of a login context. The user’s client process and the associated server process “negotiate” the authentication mode. When the mode is successfully negotiated, the server requests, and the client sends, a mutual authentication credential which the client acquires (using its login context) from the Kerberos Ticket Granting Service (TGS). If the server can accept the credential received from the client, then both of the following are true:

- The server has proof of the identity of user represented by the client, and
- The client has proof that it is talking with the intended server

At this point the server can grant the user appropriate rights on the remote machine, and the client and server may negotiate the data policy (integrity or privacy via encryption) to be applied to their subsequent communications.

The steps for using the Kerberized tools are:

- Do a `dce_login`. (To use the tools a user must have a DCE account.)
- Execute a **`kinit -f`** to mark the user’s login context as forwardable. This step is optional; it is necessary only if the user intends to forward his or her login to a trusted server system. See *Section 2.4.3 on page 65*.
- For telnet, a user must **set autologin**. This can be done in an initialization file, “.telnetrc,” with “set autologin.” This step may not be necessary; use the `display` command to determine if autologin is set by default.

2.4.2 Installation

The loading process places the executables in the `/opt/dcelocal/bin` directory. When the installation of the tools is confirmed, the setup process modifies the `/etc/services` file to indicate to the **inetd** daemon that the Kerberized **telnetd**, **ftpd**, and **rlogind** daemons are located in the `/opt/dcelocal/bin` directory. Original non-Kerberized executables are not removed from the system. The administrator has the responsibility for moving them or storing them.

The administrator is also responsible for placing executables in a location appropriate for users to access. The installation procedure does not automatically move the Kerberized client executables from the `/etc/dcelocal/bin` directory to a place where they will be discovered for execution during user PATH processing. The installation of the client binaries is the responsibility of the system administrator.

After the installation of the software is complete, the `inetd` daemon must be directed to reread its configuration file (`/etc/inetd.conf`). The recommended way of doing this is to send a HUP signal to the `inetd` process (alternatively, the process may be stopped and restarted).

dcesetup uses **kcfg** to install the Kerberized tools. **kcfg** is also available for use by an administrator. To find out more information about the **kcfg** program, execute two commands. To display individual command switches and their arguments:

```
kcfg -?
```

If that doesn't work with your shell, try an alternative entry, "kcfg -\?" It tells the shell to pass a question mark to the executable as opposed to resolving the "?" character as a regular expression.

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

```
kcfg -h
```

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

2.4.3 Ticket Forwarding

The telnet and ftp processes allow the user's client process to designate that its login context (or TGT) be securely forwarded to the associated server process as part of mutual authentication. The user may choose this functionality by invoking the client process with the "-f" flag. If the user's TGT was not designated as forwardable by the AS, then the Kerberos infrastructure of the server machine will reject the forwarded TGT. A user may obtain a forwardable TGT by issuing the `kinit -f` command (following a successful `dce_login`).

A user would choose to forward the TGT to a server when he or she wants the server process to impersonate the user's network identity when performing actions on behalf of the user on the target machine. Independent of credential forwarding, the server will impersonate the local operating system identity of the user. Network identity impersonation is useful when there are resources that the server will not be able to access on behalf of the user unless the server operates with the user's network/Kerberos credentials. A DFS file protected by an ACL which authorizes access only to (Kerberos) authenticated users would be an example of such a resource.

A word of caution about forwarding TGTs to server systems. The Kerberos infrastructure stores TGTs, including forwarded TGTs, in files. Access to these files is protected by the local operating system. Any user who has system administrator privilege, or who has managed to subvert the system's security, can read any Kerberos credentials stored on the system. This allows the user to assume the network identity represented by the credential, and use it to impersonate the associated network identity on any system that recognizes it. For this reason, users would be wise to be conservative in their use of ticket forwarding.

The **dcesetup** configuration script insures that all new accounts will be able to request forwardable TGTs via the `kinit -f` mechanism. A forwardable TGT should not be forwarded to a server system by the telnet or ftp clients unless the user designates that it be forwarded.

2.4.4 Modifying the Registry

All machines within a cell that use the Kerberos-enabled `rtools` 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 execute “kcfg -k” to change the /krb5/krb.conf entries into two separate files, /krb5/krb.conf and /krb5/krb.realms. This command needs to be executed 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.

NOTE: A potential problem that can defeat the installation and operation of the tools is to be found in the different ways “hostname” is determined.

The **kcfg** command uses the function **gethostname()** to create the host principal entry in the registry. The **gethostname()** function acquires the hostname as it is configured with the **hostname** command at startup.

The **telnet** process gets “hostname” using the **gethostbyname()** function, which gets the hostname out of either the /etc/hosts file or the DNS/BIND database.

Difficulties arise, for example, if the hostname is configured at startup as “mycomputer” but is registered in /etc/hosts and the bind database as “mycomputer.here.com.” If the telnet process looks for the host server, it looks for “host/mycomputer.here.com.” If the kcfg process configures the host entry in the registry, it configures “host/mycomputer.”

2.4.5 Uninstalling the Kerberos Tools

To reverse the installation of the Kerberized tools, go to the Modify Configuration Menu and choose Option 9, Disable Kerberos. Then go to the configuration file, /etc/initd.conf and, if necessary, remove all references to the tools.

2.5 Creating a Private Key Storage Server

Gradient DCE for Tru64 UNIX adds public key security technology as provided in OSF DCE Release 1.2.2. It refers to a security model that works by requiring a public and a private key pair to lock or unlock information. Private keys are too long for memorization, hence the requirement for secure storage. A private key storage server (PKSS) can be enabled during installation to store users’ software-generated private keys.

Private keys are used most often at login. That presents a key management problem if the keys appear where they might be corrupted or stolen. Short of issuing smart cards, enabling the private key storage service provides the best assurance that messages encrypted under one of the key pairs can be decrypted using another pair without being intercepted and read in transit.

CHAPTER 3

Configuring DCE



3.1 Overview of New Cell Configuration

The following steps explain how to create a cell and configure the Security server and CDS server on the same system.

- 1 To begin your initial cell creation and server configuration, log in as **root** and invoke **dcesetup (/usr/sbin/dcesetup)**. If you are not logged in as root, the **dcesetup** utility can perform only the **Show** and **Version** choices. The **dcesetup** utility displays the following menu:

```
*** DCE Setup Main Menu ***
```

```
Version V4.0 (Rev. 635)
```

- | | |
|--------------|---|
| 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) CVP | Run Configuration Verification Program |
| 9) Version | Show DCE Version number |
| X) Exit | |

Please enter your selection:

NOTE: For troubleshooting during configuration, open an additional window after you invoke **dcsetup**, and enter the following command:

tail -f /opt/dcelocal/dcsetup.log

This window allows you to track the configuration procedure as it executes. The file **dcsetup.log** captures most configuration errors. If you are not logged in as root, the log file is named **/tmp/dcsetup.username.log**.

- 2 If you are creating a new cell or adding a CDS server, choose option 3 (Terminate all active DCE daemons) 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:

```
*** Configuration Choice Menu ***
```

- 1) Configure this system as a DCE Client
- 2) Create a new DCE cell
- 3) Add Master CDS server
- 4) Configure DCE Distributed File Service (DFS)
- 5) Modify DCE Cell Configuration
- 6) Configure this system for RPC only
- 7) Configure DCE in TruCluster
- R) Return to previous menu

Please enter your selection (or '?' for help):

- 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 hostname; 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 **yes** to configure the CDS and security servers on the same system. Answer **no** 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 **yes** 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? (y/n/?) [n]:

If your cell will be running any CDS servers based on OSF DCE Release 1.0.3a or lower (equivalent to DCE for DIGITAL UNIX Version 1.3b or lower), you should answer **yes**. 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 cell aliasing, CDS delegation ACLs, and so on.

If all CDS servers in your cell will be based on DCE for Tru64 UNIX Version 2.0 (or higher) and based on OSF DCE Release 1.1 (or higher), answer **no**.

The configuration utility sets the directory version number to 4.0 for compatibility with DCE for Tru64 UNIX Version 2.0 (or higher) CDS servers (OSF DCE Releases 1.1 and 1.2.2). This enables the use of OSF DCE Release 1.1 features such as cell aliasing, 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 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 DCE for Tru64 UNIX 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? (y/n) [n]:

Do you want this system to be a DTS Server (y/n/?) [y]:

Do you want this system to be a DTS Global Server (y/n/?) [n]:

Does this cell use multiple LANs? (y/n/?) [n]:

Answer the questions appropriately.

- 10 The configuration utility asks whether you want to run this system as a PKSS server. Answering **yes** configures the system to run as a PKSS server.

Do you want this system to be a PKSS server (y/n/?) [y]

- 11 The **dcsetup** configuration utility asks whether you want to enable DCE SIA (Security Integration Architecture). The default answer is **no**. Answering **yes** configures security-sensitive commands such as **login**, **su**, **telnet**, **ftp**, and so on, to perform DCE authentication in addition to usual local security operations performed by these commands. For more information about DCE SIA, refer to the *Gradient DCE for Tru64 UNIX Product Guide*.

Do you want to enable DCE SIA? (y/n/?) [n]:

- 12 The configuration utility asks if you want to run the MIT Kerberos 5 services on this machine. A **yes** answer runs the configuration utility and (optionally) installs the ‘Kerberized’ version of telnet, rsh, and rlogin on the system.

Do you intend to run MIT Kerberos 5 services on this machine? [y]

- 13 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? (y/n/?) [n]

- 14 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? (y/n/?) [n]

- 15 Next, the screen displays your selections and asks whether to save them as your DCE system configuration. Answer **yes**.
- 16 After the gda daemon is started, you are prompted to run the DCE Configuration Verification Program (CVP). Press **<Return>** to start the CVP. After the procedure runs the CVP, the procedure automatically updates the system startup procedure so the daemons restart automatically whenever the system is rebooted.
- 17 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.

3.2 Configuring Your System as a DCE Client with Runtime Services

If you want to add your system to an existing cell:

- 1 Choose option 1 (Configure this system as a DCE Client) from the Configuration Choice Menu. This option configures the runtime services subset on your system.

NOTE: During 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 with 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:

At each prompt, enter <RETURN> to take the default displayed in [braces] or enter '?' for help.

Press <RETURN> to continue:

Shutting down DCE services

DCE services stopped

Removing temporary local DCE databases and configuration files

Removing permanent local DCE databases and configuration files

Starting client configuration

Initializing dced (dced)...

Starting dced (dced)...

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? (y/n) [y] :

- 2 If you know the name of your DCE cell, answer **no**. As prompted, supply the name of your DCE cell, your DCE hostname, and the hostname 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 **yes** to see a list of available DCE cells. As prompted, supply your DCE hostname. At the next prompt, supply the appropriate DCE cell name from the list.

Gathering list of currently accessible cells

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

(or '?' for help) [buster_cell]: myhost_cell

If you do not know the name of the cell you wish 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 which 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 to enter the hostname of the master CDS server for your cell.

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

```
Stopping dced...
Initializing dced (dced)...
Starting dced (dced)...
Starting CDS advertiser daemon (cdsadv)...
Testing access to CDS clerk (please wait).....
Attempting to locate security server
Found security server
Creating /opt/dcelocal/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 Mar 11 12:01:14 1998

Is this time correct? (y/n):

- 3 Make sure you check that the correct time is displayed before you continue with the configuration.
- 4 If the time is incorrect, specify **no**, and the procedure exits to the operating system to allow you to reset the system time. After you correct or verify the time, specify **yes**, 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 DCE for Tru64 UNIX
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? (y/n) [n]:
```

- 5 Specify **yes** to accept time from any DECnet/OSI DECdts server; however, time from this source is unauthenticated. If you specify **no**, 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 (y/n/?) [y]:
```

- 6 Answer **yes** to configure the host as a DTS client.
- 7 If you want to use DCE Security Integration Architecture (SIA), specify **yes** to the following:

```
Do you want to enable DCE SIA? (y/n/?) [n]:
```

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

```
Stopping dcesetup...
```

This operation requires that you be authenticated as a member of the `sec-admin` group. Please login.

```
Enter Principal Name: cell_admin
```

```
Password:
```

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.

- 8 You must delete these principals to continue with the configuration.

```
Configuring security client
```

```
Creating /krb5/krb.conf file
```

```
Adding kerberos5 entry to /etc/services
```

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

```
hosts/dcehost/self
```

```
Do you wish to delete these principals? (y/n/?) [y]:
```

```
Deleting client principals
```

```
Creating ktab entry for client
```

```
Stopping dced...
```

```
Initializing dced (dced)...
```

```
Starting dced (dced)...
```

```
Starting sec_client service (please wait).
```

This machine is now a security client.

- 9 If your cell uses multiple LANs, you are prompted with the next question:

```
Please enter the name of your LAN (or '?' for help) []:
```

If your LAN has not been defined in the namespace, you are asked whether you want to define it.

- 10 The configuration utility asks whether you want to configure `gdad` to connect to LDAP.

```
Do you want to configure gdad to use LDAP? (y/n/?) [n]:
```

- 11 The procedure configures the requested services, and then prompts you to complete the configuration of the security server on the other machine before continuing:

```
Configuring CDS client
```

```
Creating the cds.conf file
```

```
Starting CDS advertiser daemon (cdsadv)...
Testing access to CDS server (please wait).
Deleting known hosts/dcehost objects from name space
Creating hosts/dcehost objects in name space
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
    svrconf
Configuring DTS daemon as client (dtsd)
Starting DTS daemon (dtsd)...
Waiting for DTS daemon to synchronize (please wait)
This machine is now a DTS clerk.
Configuring Kerberos and telnetd..
Enabling DCE SIA...
Do you want to run the DCE Configuration Verification Program? (y/n) [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 **yes** to run the CVP at this time, you see the following display:

```
Executing DIGITAL DCE V4.0 (Rev. 635) for DIGITAL UNIX CVP (please wait)
Copyright (c) Digital Equipment Corporation. 1998. All Rights Reserved.
Verifying.....
```

```
DIGITAL DCE V4.0 (Rev. 635) for DIGITAL UNIX CVP completed successfully
Modifying system startup procedure...
```

The DCE components that you have configured are added to your system startup procedure so the daemons restart automatically whenever the system is rebooted. When the procedure is completed, the DCE Setup Main Menu appears again.

If the client system and a CDS server are on the same subnet, the client can automatically locate the CDS server. In this case, the client configuration is complete.

However, if the client system does not share a subnet with a CDS server, you must manually enter a CDS server's location information into the client's CDS cache.

12 Press **X** to exit **dcsetup**.

13 Then enter CDS server location information into the client's CDS cache.

```
# dcecp -c cds-cache create <name> -binding <protseq>:<ip_addr>
```

where

<name> is the simple name of the cached server machine.

<protseq> is a CDS server's protocol sequence.

<ip_addr> is the Internet Protocol address of <name>.

For example:

```
# dcecp -c cds-cache create pelican \  
-binding ncacn_ip_tcp:16.20.15.25
```

3.3 Configuring DCE Clients in a Cluster

The configuration script will prompt you once, at the beginning, concerning the following items. The script will use that information repeatedly, at the configuration of every member.

Before configuration, be ready to answer the following:

- Cell Name
- Host name, machine that is running the CDS Master Server
- Cell administration account
- Cell administration Password

3.3.1 Configuring Time Services

Do not configure DTS in a cluster. TruClusters use the NTP time service to maintain clock synchronization between cluster members. Be sure the cluster and the DCE cell's DTS servers obtain time from the same NTP time source. Make sure that the clock reference for the cluster is within three minutes of the DCE cell clock time. This will prevent time related problems either during client configuration or operation.

3.3.2 Configuring Cluster Members

NOTE: Before configuring a DCE client on Sierra Cluster 2.0, be sure to refer to section 9.4 of the Compaq *Alpha Server™ SC 2.0 Installation Guide*. Follow that guide to make sure the local /tmp directory is available before you start configuration.

- 1 Navigate to the Configure DCE in TruCluster Menu as in the first steps of Section 3.1

You must be logged in as **root** to configure your DCE system.

Invoke dcesetup,

```
# /usr/sbin/dcesetup
```

At the DCE Setup Main Menu, choose option 1:

Configure DCE services on this system

At the Configuration Choice Menu, choose option 7:

Configure DCE in TruCluster

At the Cluster Configuration Choice Menu, choose option 2:

- 1) **Configure this member as a DCE Client**
 - 2) **Configure all cluster members as DCE Clients**
 - R) **Return to previous menu**
- Please enter your selection (or '?' for help)**

General directions follow. Have the answers ready, from the four questions listed above. For information about determining these names, see your cell administrator or *Chapter 2.1 on page 57*

At each prompt, enter <RETURN> to take the default displayed in [braces] or enter '?' for help.

In the following example (for only configuring DCE), where defaults were overridden, the choice taken shows to the right of the colon. Where the braces are empty, provide your answers, then enter <RETURN> .

Press <RETURN> to continue:

Beginning of remote client configuration

2 Enter your decisions.

Please enter the name of your DCE cell [] : t40g_test_cell

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

Do you want to enable DCE SIA? (y/n/?) [n]:

Do you intend to run MT Kerberos 5 services on this machine [y] : n

Does this cell use multiple LANs? (y/n/?) [n]:

Do you want to configure this host as an LDAP client? (y/n/?) [n]:

Do you wish to overwrite existing DCE configurations on ALL cluster members? (y/n)

[y]:

3 Enter your Principal Name and Password.

Remote configuration requires that you be authenticated as a member of the sec-admin group. Please supply the principal and password.

Enter Principal Name: cell_admin

Password:

4 Choose to verify configuration after each client.

Do you want to run the DCE Configuration Verification Program after configuring each

client? (y/n/?) [y]:

Configuration Options

Cell name: t40g_test_cell

CDS server machine: reeses

CDS server IP: 204.164.67.165

SIA: DISABLED

SIA forwarding: DISABLED

KRB services: DISABLED

Single LAN cell

LDAP client: DISABLED

Remote configuration overwrite: YES

Cell admin account: cell_admin
Cell admin password: -dce-
Run CVP after configuration: YES

Confirm the configuration choices (y/n) [y] : y

5 Confirm or reject the Configuration Options.

The configuration script (Example is only configuring DCE) reports the progress as follows:

Configuring Cluster Member: clu1

clu1:

clu1: Remote configuring machine into DCE cell: t40g_test_cell

clu1:

clu1: Cleaning up any old configuration information

clu1:

clu1:

clu1: Shutting down DCE services

clu1:

clu1: DCE services stopped

clu1:

clu1: Removing temporary local DCE databases and configuration files

clu1:

clu1: Removing permanent local DCE databases and configuration files

clu1:

clu1: Starting remote client configuration

clu1: Initializing dced (dced)...

clu1: Starting dced (dced)...

clu1: Configuring PKSS client...

clu1: Starting CDS advertiser daemon (cdsadv)...

clu1:

clu1: Attempting to locate security server

clu1: Found security server

clu1: Creating /opt/dcelocal/etc/security/pe_site file

clu1: Checking local system time

clu1: Looking for DTS servers in the LAN profile

clu1: Looking for Global DTS servers in this cell

```
clu1:          No DTS servers found in cell
clu1:          (If you have other LAN profiles, DTS servers may still
clu1:          be available)
clu1:
clu1:
clu1:          Stopping cdsadv...
clu1:
clu1:          Configuring security client
clu1:          Creating /krb5/krb.conf file
clu1:          Adding kerberos5 entry to /etc/services
clu1:          Creating ktab entry for client
clu1:
clu1:          Stopping dced...
clu1:          Initializing dced (dced)...
clu1:          Starting dced (dced)...
clu1:          Starting sec_client service (please wait) .
clu1:
clu1:          This machine is now a security client.
clu1:
clu1:          Configuring CDS client
clu1:          Creating the cds.conf file
clu1:          Starting CDS advertiser daemon (cdsadv)...
clu1:          Testing access to CDS server (please wait) .
clu1:          Creating hosts/clu1 objects in name space
clu1:
clu1:          This machine is now a CDS client.
clu1:          Stopping sec_client service...
clu1:          Starting sec_client service (please wait) .
clu1:          Mdfifying acls on ./:/hosts/clu1/config
clu1:          secval
clu1:          xattrschem
clu1:          srvrexec
clu1:          keytab
clu1:          keytab/self
clu1:          hostdata
clu1:          hostdata/dce_cf.db
clu1:          hostdata/cell_name
clu1:          hostdata/pe_site
```

```
clu1:          hostdata/cds_attributes
clu1:          hostdata/cds_globalnames
clu1:          hostdata/host_name
clu1:          hostdata/cell_aliases
clu1:          hostdata/post_processors
clu1:          hostdata/svc_routing
clu1:          hostdata/krb.conf
clu1:          hostdata/dfs-cache-info
clu1:          hostdata/cds.conf
clu1:          hostdata/passwd_override
clu1:          hostdata/group_override
clu1:          srvrconf
clu1:
clu1:          Unconfiguring Kerberos...
clu1:
clu1:          Executing Entegrity Gradient DCE V4.1 for Tru64 UNIX V5.1
(Rev.
1381) CVP (please wait)
clu1:          Copyright (c) Entegrity Solutions, Inc. 2001. All
RightsReserved
clu1:          Copyright (c) Digital Equipment Corporation. 1996. All
Rights Reserved.
clu1:
clu1:          Verifying.....
clu1:
clu1:          Entegrity Gradient DCE V4.1 for Tru64 UNIX V5.1 (Rev.
1381) CVP completed successfully
clu1:
clu1:          Mdifying system startup procedure...
clu1:
clu1:          Remote configuration completed
Press <RETURN> to continue:
```

6 Press <RETURN> to continue :

The DCE components that you have configured are added to each of the cluster member's system startup procedure so the daemons restart automatically whenever the cluster member is rebooted. After all of the cluster members are configured, then the DCE Setup Main Menu appears again.

3.4 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.

3.4.1 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.

- 1 Choose option 2 (Create a new DCE cell) from the Configuration Choice Menu. Answer the prompts appropriately for the cellname and hostname. Then answer **no** at the following prompt:

```
Do you wish to configure myhost as a CDS server? (y/n/?) [y]: n
```

- 2 Verify the system time at the following message and prompt:

```
*****
* 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 <myhost>: Wed Jun 12 13:39:24 EDT 1998
```

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

Make sure you validate the time before you specify **yes**. If the system time is incorrect, answer **no**; the configuration procedure exits to the operating system to allow you to correct the system time. You can then reconfigure.

```
Do you need the Distributed Time Service? (y/n/?) [y]:
```

If you will be using any distributed applications that depend on synchronized time, type **yes** or press **<Return>** to participate in the Distributed Time Service (DTS).

The DECnet/OSI DECdts daemon (**dtssd**) and the DCE DTS daemon (**dttd**) are incompatible and cannot be used on the same host. If your machine is running DECnet/OSI, the configuration procedure next displays the following message:

```
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 DCE for Tru64 UNIX
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? (y/n) [n]:

Specify **yes** to accept time from any DECdts server; however, time from this source is unauthenticated. If you specify **no**, this system accepts time only from DCE time servers.

Do you want this system to be a DTS Server (y/n/?) [y]:

Do you want this system to be a DTS Global Server (y/n/?) [n]:

If DECnet/OSI is not installed, this system must be configured as either a DTS clerk or a DTS server. Briefly, there should be three DTS servers per cell.

- 3 The configuration utility asks if you want to run this system as a PKSS server. Answering **yes** configures the system to run as a PKSS server.

Do you want this system to be a PKSS Server (y/n/?) [y]:

- 4 Next, the procedure asks whether to enable DCE Security Integration Architecture (SIA).

Do you want to enable DCE SIA? (y/n/?) [n]:

- 5 Next, the configuration utility asks if you want to run the MIT Kerberos 5 services on this machine. A **yes** answer will run the Kerberos config utility and (optionally) install the “Kerberized” version of telnet on the system.

Do you intend to run MIT Kerberos 5 services on this machine [y] :

- 6 The utility asks if you want to configure the LDAP name service on this system. A **yes** answer prompts a query to ask if you want to configure the system as a LDAP client and ask if you would enter further information regarding the LDAP services you want.

Do you want to configure the LDAP name service? (y/n/?) [n]:

- 7 The configuration utility asks whether you want to configure gdad to use LDAP.

Do you want to configure gdad to use LDAP? (y/n/?) [n]:

After you respond to the last prompt, the following messages appear:

```
DCE Cellname: myhost_cell
```

```
DCE Hostname: myhost
```

```

Use myhost as a CDS Server?  No
Use myhost as the Security Server?  Yes
Use dhaka as a DTS Local Server?  Yes
Use myhost as the PKSS Server?  Yes
Enable Kerberos 5 services?  Yes
Enable DCE SIA?  No
Enable LDAP GDA?  No
Configure myhost as an LDAP client?  No

```

Do you want to save this as your DCE system configuration? (y/n/?) [y]:

- 8 Answer **no** to change your selections. Answer **yes** to accept your selections. The procedure configures **myhost** as a Security server and then prompts you to enter a keyseed value (enter several random keystrokes):

```

*****
* 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:

- 9 You are prompted to enter and then confirm the **cell_admin** password. Remember this password.

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

Type again to confirm:

The procedure configures more services and then pauses for you to configure the master CDS server on another system.

```
*****
```

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. *

```
*****
```

- 10 Go to the machine where you will configure the master CDS server.

3.4.2 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.

- 1 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. The following messages appear:

```
*****
* 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 cdshost.abc.dec.com: Wed Jun 12 13:52:28 EDT 1998
```

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

Verify the correct time before answering **yes**.

- 2 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? (y/n/?) [n]:
```

If your cell will be running any CDS servers based on OSF DCE Release 1.0.3a or lower, you should answer **yes**. 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 cell aliasing, CDS delegation ACLs, and so on.

If all CDS servers in your cell will be based on DCE for Tru64 UNIX Version 2.0 or higher (or an equivalent DCE version based on OSF DCE Release 1.1) answer **no**. The configuration utility sets the directory version number to 4.0 for compatibility with DCE for Tru64 UNIX (Version 2.0 or higher OSF DCE Release 1.1) CDS servers. This enables the use of OSF DCE Release 1.1 features such as cell aliasing, 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 hostname of the security server that you just configured.

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

The procedure continues with the following messages:

```
Creating /opt/dcelocal/etc/security/pe_site file
```

```
*****
```

```
*   Ensure the opt/dcelocal/etc/security/pe_site file   *
*   matches that on the server.                         *
*****
```

NOTE: If the procedure cannot find the IP address for the host, you will be prompted for the address. Usually, when the procedure cannot find the IP address of the host, it indicates that you may have misspelled the name.

The procedure displays the following messages and asks you to perform a **dce_login** operation.

```
Creating /krb5/krb.conf file
```

```
Adding kerberos5 entry to /etc/services
```

This operation requires that you be authenticated as a member of the sec-admin group. Please login.

```
Enter Principal Name: cell_admin
```

```
Password:
```

The procedure continues, asking the same questions as when you configured the Security server.

```
Do you need the Distributed Time Service? (y/n/?) [y]:
```

If your machine is running DECnet/OSI, the configuration procedure next displays the following message:

```
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 DCE for Tru64 UNIX
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? (y/n) [n]:
```

- 3 Specify **yes** to accept time from any DECnet/OSI DECdts server; however, time from this source is unauthenticated. If you specify **no**, this system accepts time only from DCE DTS servers.
- 4 The procedure next asks whether you want your system to be a DTS local server:

```
Do you want this system to be a DTS Local Server (y/n/?) [y]:
```

NOTE: If you answer **yes**, this machine becomes a DTS local server; if you answer **no**, this machine does not become a DTS local server, and you should configure some other system as the DTS server. Entegrity recommends that you configure three DTS servers per cell. Next, the procedure asks whether your cell uses multiple LANs.

- 5 The procedure next asks whether this cell uses multiple LANs:

Does this cell use multiple LANs? (y/n/?) [n]:

If your cell uses multiple LANs, you are prompted with the next question:

Please enter the name of your LAN (or '?' for help) []:

If your LAN has not been defined in the namespace, you are asked whether you want to define it.

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:
```

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

3.4.3 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.

- 1 Return to the system on which you configured the security server and press the **<Return>** key. The following prompt appears:

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

- 2 Provide the hostname of the system you just configured as the master CDS server for this cell. After you enter the hostname of the master CDS server, the following prompt is displayed:

Can myhost broadcast to cds_master_server? (y/n/?) [y]:

If you respond **n** to this prompt, the procedure asks you to specify the IP address of the CDS server. You can find the IP address either by performing a **grep** operation for the hostname in the **/etc/host** file, or by performing an **nslookup** operation for the hostname. Once it has been

determined that **myhost** can broadcast to **cds_master_server**, the procedure displays the following messages and asks whether you want to run the configuration verification program. This operation requires that you be authenticated as a member of the sec-admin group. Please login.

```

Enter Principal Name:  cell_admin
Password:
Configuring CDS client
  Creating the cds.conf file
  Starting CDS advertiser daemon (cdsadv)...
  Testing access to CDS server (please wait)...
  Creating hosts/myhost objects in name space
Configuring DTS daemon as server (dtsd)
  Stopping sec_client service...
  Starting sec_client service (please wait).
  Starting DTS daemon (dtsd)...
  Waiting for DTS daemon to synchronize (please wait)

```

If you enabled DCE SIA, the procedure also displays the following message:

```
Enabling DCE SIA
```

The procedure asks whether you want to run the configuration verification program:

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

- 3 You can run the CVP now by answering **yes**, or you can run the CVP at a later time by answering **no**. 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.
- 4 Return to the host on which you are configuring the master CDS server and complete the installation.

3.4.4 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? (y/n) [y]:
```

You can run the CVP now by answering **yes**, or you can run the CVP at a later time by answering **no**. 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.

3.5 Using DCE SIA Security

The Tru64 UNIX operating system provides two local security mechanisms: Berkeley Standard Distribution (BSD) security and C2 class security. The default Tru64 UNIX configuration has BSD security enabled.

When you use **dcsetup** to enable or disable SIA, an SIA configuration file, **/etc/sia/matrix.conf**, selects the appropriate configured security mechanism. This configuration file contains entries for a set of **siad** routines. The operating system is provided with a default **matrix.conf** file that contains only BSD entries. Layered products that choose to use another security mechanism must modify this configuration file.

Depending on how **matrix.conf** is set up on the local system, the SIA layer calls the corresponding **siad** routines in each of the configured mechanisms in order. Therefore, the **siad_ses_init** routine from DCE is called before the routine from BSD if the **matrix.conf** file includes the following line:

```
siad_ses_init=(DCE, /usr/shlib/libdcesiad.so), (BSD, libc.so)
```

3.5.1 Turning On DCE SIA

During the initial installation and configuration, you will be asked if you want to turn on DCE SIA (the default is “**no**”). Later, you can turn on DCE SIA security by choosing option 8 (Enable DCE SIA) from the Modify Configuration Menu. After you choose this option, **dcsetup** executes the shell script **/opt/dcelocal/etc/sec_insert_dce_entries.sh** to perform the following operations:

- 1 Checks whether **KRB5CCNAME** exists in the **/usr/lib/X11/xdm/xdm-config** file on the local system. If it does exist, the script continues to step 3. If it does not exist, the script saves the original **xdm-config** file with the name **xdm-config.sav n** (where *n* is the next available number).

NOTE: You are responsible for deleting all the **.sav*** files created by enabling or disabling DCE SIA.

- 2 Adds **KRB5CCNAME** to the **/usr/lib/X11/xdm/xdm-config** file, so that the console login preserves the credential handle, **KRB5CCNAME**, after a successful login to DCE.
- 3 Checks whether DCE entries exist in the **matrix.conf** file. If DCE entries exist, the script ends; if no entries exist, the script performs steps 4 and 5.
- 4 Saves the original **matrix.conf** file with the name **matrix.conf.sav n** (where *n* is the next available number) in the **/etc/sia** directory.

- 5 Inserts DCE entries for all **siad** routines in the **matrix.conf** file. For example, before modification, the entry might look as follows:

```
siad_init=(BSD, libc.so)
```

After modification, the new entry looks as follows:

```
siad_init=(DCE, /usr/shlib/libdcesiad.so), (BSD, libc.so)
```

where **libdcesiad.so**, installed by DCE, is a shared library containing all the DCE **siad** routines.

3.5.2 Turning Off DCE SIA Security

To turn off DCE SIA security, choose option 8 (Disable DCE SIA) from the Modify Configuration Menu. After you choose this option, **dcsetup** executes the **/opt/dcelocal/etc/sec_remove_dce_entries.sh** shell script to perform the following operations:

- 1 Checks whether **KRB5CCNAME** exists in the **/usr/lib/X11/xdm/xdm-config** file on the local system. If it does not exist, the script continues to step 3. If it does exist, the script saves the original **xdm-config** file with the name **xdm-config.sav n** (where *n* is the next available number).
- 2 Removes **KRB5CCNAME** in **/usr/lib/X11/xdm/xdm-config**.
- 3 Checks whether DCE entries exist in the **matrix.conf** file. If they do not, the script ends; if they do exist, the script performs steps 4 and 5.
- 4 Saves the **matrix.conf** file with the name **matrix.conf.sav n** (where *n* is the next available number) in the **/etc/sia** directory. (The script saves the existing configuration file instead of reusing the prior one that had DCE SIA turned off, in case other layered products have added their security mechanisms in the interim.)

NOTE: You are responsible for deleting all the **.sav*** files created by enabling or disabling DCE SIA.

- 5 Removes DCE entries from all **siad** routines in the **matrix.conf** file. For example, before modification, the entry might look as follows:

```
siad_init=(DCE, /usr/shlib/libdcesiad.so), (BSD, libc.so)
```

After modification, the new entry looks as follows:

```
siad_init=(BSD, libc.so)
```

3.5.3 Managing Your SIA Environment with SIACFG

System administrators can use the **SIACFG** configuration program to display and resolve inconsistencies between UNIX account information stored in the DCE/Kerberos user database and corresponding information stored in the user database of the local machine.

You can activate **SIACFG** by using the following command :

siacfg [-l <file>] [-q] [-o] [-C | -P]

SIACFG may be activated in command mode, by including either the **-C** or **-P** option on the command line, or in menu mode, by not including either option. In either mode, the optional **-l**, **-q**, and **-o** switches may be used to modify the behavior of **SIACFG**; the **-q**(quiet) switch reduces the amount of informational output produced by **SIACFG**, the **-o**(override) switch causes any override entries that are created to include a password field, and the **-l**(og) switch, along with its argument, may be used to capture a record of an **SIACFG** session.

SIACFG captures the results of the database comparison and the conflict resolution choices made by the administrator in a persistent and modifiable form referred to as the “Normalization Plan”. There are two commands available in command mode that can be used to manage the Normalization Plan: command C, “Compare and Create Normalization Plan”, and command P, “Apply or Publish Normalization Plan.” In menu mode, a third command M, “Modify Normalization Plan” allows an administrator to modify the existing plan. The administrator creates a plan using the C command, and refines it if necessary using the M command.

Once the administrator determines that the plan properly resolves the detected conflicts, the administrator employs the P command to create and install the password and group override files and create any DCE registry objects called for by the plan. Once a plan has been created, the conflict detection and resolution processing performed by the C command assumes that the existing plan has been applied, and detects only those conflicts that would not be resolved by the plan. The administrator may publish, retest for conflicts, modify, and republish. The **SIACFG** Normalization Plan is stored in the following files.

- /opt/dcelocal/var/adm/security/public_accounts
- /opt/dcelocal/var/adm/security/local_accounts
- /opt/dcelocal/var/adm/security/public_groups
- /opt/dcelocal/var/adm/security/local_groups
- /opt/dcelocal/var/adm/security/group_override
- /opt/dcelocal/var/adm/security/passwd_override

Overrides are configured in the following files.

- /opt/dcelocal/etc/group_override
- /opt/dcelocal/etc/passwd_override

3.5.4 SIA Credentials Forwarding

SIA (Security Integrated Architecture) mechanism now supports creation of forwardable credentials.

To enable SIA forwardable credential creation put the following into the **/opt/dcelocal/dce_services.db** file

enable SIA forward

This change will take place on the next restart of DCE services.

3.5.5 Enhanced SIA Log Messages

Added enhanced log messages to the SIA library. To enable logging of SIA messages, perform the following step.

```
touch /opt/dcelocal/var/adm/security/sialog file
```

```
enable SIA forward
```

The sialog file will contain the output from the SIA DCE logging.

3.6 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 Tru64 UNIX Version 2.0 (or higher) 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. *Section 3.6.1 on page 91* provides the instructions for completing Security server migration. *Section 3.6.2 on page 92* provides the instructions for completing CDS server migration.

3.6.1 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.

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 or higher 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 or higher, you can perform the final migration steps in this section.

NOTE: 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 this version of Gradient DCE for Tru64 UNIX Security servers in your cell, perform the following actions as cell administrator:

- 1 Ensure that at least 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 wish to verify that any original 1.0.3 replicas are no longer running.

3.6.2 CDS Migration

If you have installed and configured this version of Gradient DCE for Tru64 UNIX 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.

Gradient DCE for Tru64 UNIX features, such as hierarchical cells and cell aliasing features, will be available only when all of your cell's security and CDS servers are running DCE for Tru64 UNIX Version 2.0 or higher and the upgrade steps have been completed. Refer to the *Gradient DCE for Tru64 UNIX 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 higher, you can perform the migration steps in this section. The migration steps will enable the use of hierarchical cells, cell aliasing, and delegation.

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

Once you have installed and configured Gradient DCE for Tru64 UNIX 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 *Section 3.6.1 on page 91*.
- 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 cname \
-add \{CDS_UpgradeTo 4.0 \}
# dcecp -c clearinghouse verify cname
```

- 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 Tru64 UNIX Version (2.0 or higher). This command can take a long time to execute depending on the size of the namespace.

3.7 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?(y/n) [y]:
```

If you type **yes** or press **<Return>**, the procedure indicates that the CVP is running.

```
Executing DIGITAL DCE V4.0 (Rev. 635) for DIGITAL UNIX CVP (please wait)
```

```
Copyright (c) Digital Equipment Corporation. 1998. All Rights Reserved.
```

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:

DIGITAL DCE V4.0 (Rev. 635) for Compaq Tru64 UNIX 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.

3.8 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 **/opt/dcelocal/dcesetup.log**. (If **dcesetup** is run without **root** privileges, the log file will be located in **tmp/dcesetup.username.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. Use the command **/usr/sbin/dcesetup restart** to retry if errors are encountered during the startup of the DCE daemons. For more information about this command, see the *Gradient DCE for Tru64 UNIX Product Guide*.

CHAPTER 4

Modifying Cell Configuration



4.1 Overview of Cell Re-Configuration

Here is the menu you use to change the configuration of your cell.

NOTE: The operations in the following table require superuser (root) privileges.

Table 4-1: Modify Configuration Menu

Menu Option	Description
1) Add Replica CDS Server / Remove Replica CDS Server	Creates or removes a replica of the master CDS server on the current machine. If your machine already has a replica of the master CDS server, the menu option shows "Remove Replica CDS Server."
2) Add Replica Security Server / Remove Replica Security Server	Creates or removes a replica of the master security server on the current machine. If the machine already has a replica of the master security server, the menu option shows "Remove Replica Security Server."
3) Add DTS Local Server / Change from DTS Local Server to DTS Clerk	Adds a DTS local server to the current machine. If your machine is already configured as a DTS Local Server, this menu option is Change from DTS Local Server to DTS Clerk. If so, you can choose that option to configure the current machine as a DTS Clerk.
4) Add DTS Global Server / Change from DTS Global Server to DTS Clerk	Adds a DTS global server to the current machine. If your machine is already configured as a DTS global Server, this menu option is Change from DTS Global Server to DTS Clerk. If so, you can choose that option to configure the current machine as a DTS Clerk.
5) Add Null Time Provider	Sets the time inaccuracy value but prevents DTS from setting the time. Choose this option if you do not want DTS to set the system time.
6) Add NTP Time Provider	Directs the current machine to get the time from an NTP server.
7) Enable Auditing/ Disable Auditing	Enables or disables DCE security auditing on the system.
8) Enable DCE SIA / Disable DCE SIA	Enables or disables DCE security integration architecture (SIA) on the system.

Table 4-1: Modify Configuration Menu (Continued)

Menu Option	Description
9) Enable Kerberos 5 / Disable Kerberos 5	Enables or disables MIT Kerberos 5 security services for telnet, rlogin, and rsh.
10) Configure LDAP Name Service	Configures LDAP (lightweight directory access protocol) name service.
11) Add LDAP Client Services / Remove LDAP Client Services	Add or remove the LDAP name service client; that is, to create internally the server, group, and profile entries in the LDAP name space like those entries that are used in CDS during the DCE client configuration.
12) Enable LDAP GDA / Disable LDAP GDA	Enables or disables Global Directory Agent (GDA) use of LDAP to find foreign cells.
13) Add PKSS Server / Remove PKSS Server	Enables or disables private key storage server (PKSS). Public key security technology includes a private key storage service where private decoding keys can be kept in security while not in use.
14) Register in X.500	Registers a DCE cell in X.500. This X.500 option displays only if X.500 is installed on the current machine.
R) Return to previous menu	Returns you to the DCE Setup Main Menu.

4.2 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? (y/n) [y] :

If you know the name of your DCE cell, answer no. As prompted, supply the name of your DCE cell, your DCE hostname, and the hostname 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 yes to view a list of available DCE cells. At the next prompt, supply the appropriate DCE cell name from the list.

You are asked to enter your DCE hostname:

Please enter your DCE hostname [myhost]:

The procedure then displays an alphabetical 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*]

The procedure then displays an alphabetical list of the cells within broadcast range of your system

```
Stopping dced...
```

```
Initializing dced (dced)...
```

```
Starting dced (dced)...
```

```
Starting CDS advertiser daemon (cdsadv)...
```

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

```
Attempting to locate security server
```

```
Found security server
```

```
Creating /opt/dcelocal/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.

Be sure that the correct time is displayed before you continue with the configuration. If the time is incorrect, specify **n**, and the procedure exits to the operating system to allow you to reset the system time. After you correct or verify the time, specify **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 Gradient DCE for Tru64 UNIX 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? (y/n) [n]:

Specify **y** to accept time from any DECnet/OSI DECdts server; however, time from this source is unauthenticated. If you specify **n**, this system accepts time only from DCE DTS servers.

Do you want this system to be a DTS Local Server (y/n/?) [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*. Entegrity recommends that you configure three DTS servers per cell.

Do you want to use DCE Security Integration Architecture (SIA)? Answering **yes** configures security-sensitive commands such as **login, su, telnet, ftp**, and so on, to perform DCE authentication in addition to usual local security operations performed by these commands. For more information about DCE SIA, refer to the *Gradient DCE for Tru64 UNIX Product Guide*. Answer **y** to the following:

Do you want to enable DCE SIA? (y/n) [n] :

After you respond the procedure stops the CDS advertiser and asks you to perform a **dce_login** operation.

Stopping dcesetup...

This operation requires that you be authenticated as a member of the sec-admin group. Please login.

You must perform a **dce_login** operation, as follows:

Enter Principal Name:

Password:

After you log in, the procedure configures the system as a client system and asks for a clearinghouse name:

Configuring security client

Creating /krb5/krb.conf file

Adding kerberos5 entry to /etc/services

Creating ktab entry for client

Starting sec_client service (please wait).

This machine is now a security client.

Configuring CDS client

Creating the cds.conf file

Starting CDS advertiser daemon (cdsadv)...

Testing access to CDS server (please wait).

Creating hosts/myhost objects in name space

NOTE: You might get a message after the line “Adding kerberos5 entry to /etc/services” that states the principals already exist under **hosts/mycell**. This message means that either another host exists with the same name or you are reconfiguring the same machine. You are prompted with the following question:

Do you wish to delete these principals (y/n/?): [y]

NOTE: You must delete the principals to continue with the configuration.

The procedure continues with the following messages and prompts:

This machine is now a CDS client.

Configuring DTS daemon as client (dtsd)

Starting DTS daemon (dtsd)...

This machine is now a DTS clerk.

Configuring CDS replica server

Adding CDS registry entries

Creating the cds.conf file

Starting CDS advertiser daemon (cdsadv)...

cdsadv is already running

Starting CDS server daemon (cdsd)...

When configuring the CDS server, the procedure asks:

What is the name for this clearinghouse? (Type '?' for help) [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.

Creating clearinghouse files and replica for root directory...

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? (y/n/?):

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 (or '?' for help):

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 done, press only the **<Return>** key. The procedure displays the following messages and asks whether you want to run the CVP.

Starting Global Directory Agent daemon (gdad)...

Starting Name Service Interface daemon (nsid)...

Do you want to run the DCE Configuration Verification Program?

(y/n/?) [y]:

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

*** Modify Configuration Menu ***

- 1) Remove 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 SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) Add LDAP Client Service
- 12) Enable LDAP GDA
- 13) Add PKSS Server
- 14) Register in X.500
- R) Return to previous menu

Please enter your selection (or '?' for help):

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

4.3 Adding 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 displays the following messages:

At each prompt, enter <RETURN> to take the default displayed in [braces] or enter '?' for help.

Press <RETURN> to continue:

Shutting down DCE services

DCE services stopped

Removing temporary local DCE databases and configuration files

Removing permanent local DCE databases and configuration files

Starting client configuration

 Initializing dced (dced)...

 Starting dced (dced)...

 Gathering list of currently accessible cells

Please enter your DCE hostname [dcehost]:

After you enter your DCE hostname, the procedure displays an alphabetical list of cells it has found within broadcast range of your system. In many environments, the list will consist of only one name. Choose the name of the DCE cell that you want to join. If you do not know the name of the cell, consult your network administrator. Do not add the /.../ prefix to the cell name; the procedure automatically adds it.

Please enter the name of your DCE cell (or '?' for help) []:

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

 Stopping dced (dced)...

 Initializing dced (dced)...

 Starting dced (dced)...

 Starting CDS advertiser daemon (cdsadv)...

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

 Attempting to locate security server

 Found security server

 Creating /opt/dcelocal/etc/security/pe_site file

 Checking local system time

 Looking for DTS servers in this LAN

 Found DTS server

Found DTS server

Looking for DTS servers in this cell

No DTS servers found in cell

The local system time is: Wed Jul 12 11:38:14 1998

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

Make sure you check that the correct time is displayed before you continue with the configuration. If the time is incorrect, specify **n**, and the procedure exits to the operating system to allow you to reset the system time. After you correct or verify the time, specify **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 Gradient DCE for Tru64 UNIX 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? (y/n) [n]:

Specify **y** to accept time from any DECnet/OSI DECdts server; however, time from this source is unauthenticated. If you specify **n**, this system accepts time only from DCE time servers. If you want to use DCE Security Integration Architecture (SIA), answer "Y" to the following:

Do you want to enable DCE SIA? (y/n) [n] :

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

Stopping cdsadv...

This operation requires that you be authenticated as a member of the sec-admin group. Please login.

Enter Principal Name: cell_admin

Password:

Obtain the password from your cell administrator. After you perform the **dce_login** operation, the procedure continues with the following messages:

Configuring security client

Creating /krb5/krb.conf file

Adding kerberos5 entry to /etc/services

```

Creating ktab entry for client
Starting sec_client service (please wait).

```

This machine is now a security client.

The procedure continues with the following messages and prompts.

```

Configuring CDS client
  Creating the cds.conf file
  Starting CDS advertiser daemon (cdsadv)...
  Testing access to CDS server (please wait).
  Deleting known hosts/dcehost objects from name space
  Creating hosts/dcehost objects in name space

```

This machine is now a CDS client.

```

Configuring DTS daemon as client (dtsd)
  Starting DTS daemon (dtsd)...

```

This machine is now a DTS clerk.

Enabling DCE SIA

Configuring security replica server

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 server daemon (secd)...

Waiting for registry propagation...

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

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

Executing DIGITAL DCE V3.1 (Rev. 635) for Compaq Tru64 UNIX CVP (please wait)

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Verifying.

DIGITAL DCE V3.1 (Rev. 635) for Compaq Tru64 UNIX CVP completed successfully

Modifying system startup procedure...

The DCE components that you have configured are added to your system startup procedure so the daemons restart automatically whenever the system is rebooted. When the procedure completes it displays the DCE Setup Main Menu.

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

*** Modify Configuration Menu ***

- 1) Add Replica CDS Server
- 2) Remove Replica Security Server
- 3) Change from DTS Local Server to DTS clerk
- 4) Change from DTS Local Server to DTS Global Server
- 5) Add Null Time Provider
- 6) Add NTP Time Provider
- 7) Enable Auditing
- 8) Enable DCE SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) ADD LDAP Client Service

- 12) Enable PKSS Server
- 13) Enable Kerberos 5
- R) Return to previous menu

Please enter your selection (or '?' for help):

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

4.4 Adding 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. The following example assumes no prior configuration.

Choose option 3 (Add DTS Local Server) from the Modify Configuration Menu. The procedure displays the following messages and asks you to enter your DCE hostname.

At each prompt, enter <RETURN> to take the default displayed in [braces] or enter '?' for help.

Press <RETURN> to continue:

Shutting down DCE services

DCE services stopped

Removing temporary local DCE databases and configuration files

Removing permanent local DCE databases and configuration files

Starting client configuration

 Initializing dced (dced)...

 Starting dced (dced)...

 Gathering list of currently accessible cells

Please enter your DCE hostname [myhost]:

The procedure next displays an alphabetical list of the cells within broadcast range, then asks you to enter the name of your DCE cell.

Please enter the name of your DCE cell (or '?' for help) []:

Supply the name of the DCE cell. Type the cell name without the `/.../` prefix; it is added automatically.

After you provide the cell name, depending on how your cell is configured, the following messages may be displayed:

```
Starting CDS advertiser daemon (cdsadv)...
Testing access to CDS server (please wait)....

Attempting to locate security server
Found security server
Creating /opt/dcelocal/etc/security/pe_site file
Checking local system time
Looking for DTS servers in this LAN
Found DTS server
```

```
The local system time is: Thu Jul 13 10:32:25 1998
```

Is this correct? (y/n):

Please check the time before you respond to this prompt.

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 Gradient DCE for Tru64 UNIX 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? (y/n) [n]:

If you want to use DCE Security Integration Architecture (SIA), answer **y** to the following:

Do you want to enable DCE SIA? (y/n) [n] :

Next, the procedure displays the following messages and asks you to log in. It also asks whether you want to run the CVP.

This operation requires that you be authenticated as a member of the `sec-admin` group. Please login.

```
Enter Principal Name: cell_admin
```

Password:

Configuring security client

Creating /krb5/krb.conf file
Adding kerberos5 entry to /etc/services
Creating ktab entry for client
Starting sec_client service (please wait).

This machine is now a security client.

Configuring CDS client

Creating the cds.conf file
Starting CDS advertiser daemon (cdsadv)...
Testing access to CDS server (please wait).
Creating hosts/myhost objects in name space

This machine is now a CDS client.

Configuring DTS daemon as server (dtsd)

Stopping sec_client service...
Starting sec_client service (please wait).
Starting DTS daemon (dtsd)...
Waiting for DTSdaemon to synchronize (please wait).

If your system is configured as a DTS Local Server, option 3 shows “Change from DTS Local Server to DTS clerk.”

*** Modify Configuration Menu ***

- 1) Add Replica CDS Server
- 2) Add Replica Security Server
- 3) Change from DTS Local Server to DTS clerk
- 4) Add DTS Global Server
- 5) Add Null Time Provider
- 6) Add NTP Time Provider
- 7) Enable Auditing
- 8) Enable DCE SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) ADD LDAP Client Service
- 12) Enable PKSS Server

- 13) Enable Kerberos 5
- R) Return to previous menu

Please enter your selection (or '?' for help):

Choose option 3 if you wish 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.

4.5 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.

The configuration prompts you with the following messages:

At each prompt, enter <RETURN> to take the default displayed in [braces] or enter '?' for help.

Press <RETURN> to continue:

Shutting down DCE services

DCE services stopped

Removing temporary local DCE databases and configuration files

Removing permanent local DCE databases and configuration files

Starting client configuration

Initializing dced (dced)...

Starting dced (dced)...

Gathering list of currently accessible cells

Please enter your DCE hostname [dcehost]:

After you enter your DCE hostname, the procedure displays an alphabetical list of cells it has found within broadcast range of your system. In many environments, the list consists of only one name. Choose the name of the DCE cell that you want to join. If you do not know the name of the cell, consult your network administrator. Do not add the */../* prefix to the cell name; the procedure automatically adds it.

Please enter the name of your DCE cell (or '?' for help) []:

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 to enter the hostname of the master CDS server for your cell.

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

```
Starting CDS advertiser daemon (cdsadv)...
Testing access to CDS server (please wait)....
Attempting to locate security server
Found security server
Creating /opt/dcelocal/etc/security/pe_site file
Checking local system time
Looking for DTS servers in this LAN
Found DTS server
Found DTS server
Looking for DTS servers in this cell
No DTS servers found in cell
```

The local system time is: Thu Jul 13 10:36:36 1998

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, specify **n**, and the procedure exits to the operating system to allow you to reset the system time. After you correct or verify the time, specify **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 Gradient DCE for Tru64 UNIX 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? (y/n) [n]:

Specify **y** to accept time from any DECnet/OSI DECdts server; however, time from this source is unauthenticated. If you specify **n**, this system accepts time only from DCE time servers.

Do you want to enable DCE SIA? (y/n) [n] :

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

This operation requires that you be authenticated as a member of the sec-admin group. Please login.

Enter Principal Name: cell_admin

Password:

Obtain the password from your cell administrator.

After you perform the **dce_login** operation, the procedure continues with the following messages:

Configuring security client

Creating /krb5/krb.conf file

Adding kerberos5 entry to /etc/services

Creating ktab entry for client

Starting sec_client service (please wait).

This machine is now a security client.

Configuring CDS client

Creating the cds.conf file

Starting CDS advertiser daemon (cdsadv)...

Testing access to CDS server (please wait).

Deleting known hosts/dcehost objects from name space

Creating hosts/dcehost objects in name space

This machine is now a CDS client.

Do you want to enable DCE SIA? (y/n/?) [n]: y

Enabling DCE SIA

Configuring DTS daemon as server (dtsd)

Stopping sec_client service...

Starting sec_client service (please wait).

Starting DTS daemon (dtsd)...

Waiting for DTS daemon to synchronize (please wait).....

Do you want to run the DCE Configuration Verification Program? (y/n/?) [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 DIGITAL DCE V3.1 (Rev. 635) for Compaq Tru64 UNIX CVP (please wait)
```

```
Copyright (c) Digital Equipment Corporation. 1998. All Rights Reserved.
```

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

```
DIGITAL DCE V3.1 (Rev. 635) for Compaq Tru64 UNIX CVP completed successfully
```

Modifying system startup procedure...

The DCE components that you have configured are added to your system startup procedure so the daemons restart automatically whenever the system is rebooted. When the procedure is completed, the DCE Setup Main Menu is redisplayed.

If your system is configured as a DTS Global Server, option 4 shows "Change from DTS Global Server to DTS clerk."

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

- 1) Add Replica CDS Server
- 2) Add Replica Security Server
- 3) Add 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 SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) Add LDAP Client Service
- 12) Enable LDAP GDA
- 13) Add PKSS Server
- 14) Register in X.500
- R) Return to previous menu

Please enter your selection (or '?' for help):

Choose this option if you wish to modify your configuration from a DTS Global Server to a DTS Clerk.

When the procedure is completed, the Modify Configuration Menu redisplay.

4.6 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 redisplay.

4.7 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.mylocation.mycompany.com
```

Press <RETURN> to continue:

Press <Return>. When the procedure is completed, the Modify Configuration Menu redisplay.

4.8 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.

```
Configuring Audit daemon (auditd)
```

This operation requires that you be authenticated as a member of the sec-admin group. Please login.

```
Enter Principal Name:
```

```
Password:
```

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 redisplay.

4.9 Configuring the Kerberos 5 Utilities

Gradient DCE for Tru64 UNIX supports Kerberized and non-Kerberized ftp, rlogin, rsh, and telnet. Those utilities allow users and services to authenticate themselves to each other and thereby prevent intrusion into the system. The utilities check authentication by reference to a secure Kerberos server.

Choosing to use the Kerberos 5 utilities means that they are added to your system startup procedure to restart automatically whenever the system is rebooted.

Choose option 9 to modify your configuration to add the Kerberos 5 utilities ftp, rlogin, rsh, and telnet.

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

- 1) Add Replica CDS Server
- 2) Add Replica Security Server

- 3) Add 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 SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) Add LDAP Client Service
- 12) Enable LDAP GDA
- 13) Add PKSS Server
- 14) Register in X.500
- R) Return to previous menu

Please enter your selection (or '?' for help):

When the procedure is completed, the Modify Configuration Menu redisplay.

4.10 Configuring the LDAP Name Service

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.

*** Modify Configuration Menu ***

- 1) Add Replica CDS Server
- 2) Add Replica Security Server
- 3) Add 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 SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) Add LDAP Client Service
- 12) Enable LDAP GDA

- 13) Add PKSS Server
- 14) Register in X.500
- R) Return to previous menu

Please enter your selection (or '?' for help):

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 shows in the LDAP name space.

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

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.

Configuring LDAP client services

Testing LDAP server access...

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

```
/usr/sbin/dcesetup: ldapsearch: not found
```

```
*** 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 redisplays.

4.11 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.

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

- 1) Add Replica CDS Server
- 2) Add Replica Security Server
- 3) Add 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 SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) Add LDAP Client Service
- 12) Enable LDAP GDA
- 13) Add PKSS Server
- 14) Register in X.500
- R) Return to previous menu

Please enter your selection (or '?' for help):

When the procedure is completed, the Modify Configuration Menu redisplay.

4.12 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.

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

- 1) Add Replica CDS Server
- 2) Add Replica Security Server
- 3) Add 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 SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) Add LDAP Client Service
- 12) Enable LDAP GDA
- 13) Add PKSS Server
- 14) Register in X.500
- R) Return to previous menu

Please enter your selection (or '?' for help):

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 displays in the LDAP name space. You are prompted for necessary information in the following dialog. You can always press "?" at the prompt for help.

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

Stopping gdad [pid: 22372] ...

Starting Global Directory Agent daemon (gdad)...

LDAP is successfully enabled for gdad

When the procedure is completed, the DCE Setup Main Menu is redisplayed.

4.13 Adding a Private Key Storage Server

Setting up a Private Key Storage Server is an important part of an overall security plan. Gradient DCE for Tru64 UNIX provides public key security technology as made available in OSF DCE Release 1.2.2. It is part of a security model that requires a public and a private key pair to lock or unlock information. The private keys are too long for memorization, hence the need for a secure place to store them.

Private keys are used most often at login. That presents a key management problem if the keys appear where they might be corrupted or stolen. Short of issuing smart cards, enabling the private key storage service provides the best assurance that messages encrypted under one of the key pairs can be decrypted using another pair without being intercepted and read in transit.

Choose option 13 to add a PKSS to your system.

*** Modify Configuration Menu ***

- 1) Add Replica CDS Server
- 2) Add Replica Security Server
- 3) Add 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 SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) Add LDAP Client Service
- 12) Enable LDAP GDA
- 13) Add PKSS Server
- 14) Register in X.500
- R) Return to previous menu

Please enter your selection (or '?' for help):

NOTE: PKSS cannot be part of a replica.

This operation requires that you be authenticated as a member of the sec-admin group. Please login.

Enter Principal Name:

Password:

Configuring PKSS server...

Starting pkssd

Press <RETURN> to continue:

When the procedure is completed, the Modify Configuration Menu is redisplayed.

4.14 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 14 to set up communications between your configured cell and the X.500 directory service.

*** Modify Configuration Menu ***

- 1) Add Replica CDS Server
- 2) Add Replica Security Server
- 3) Add 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 SIA
- 9) Enable Kerberos 5
- 10) Configure LDAP Name Service
- 11) Add LDAP Client Service
- 12) Enable LDAP GDA
- 13) Add PKSS Server
- 14) Register in X.500
- R) Return to previous menu

Please enter your selection (or '?' for help):

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 (or '?' for help):

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.

Entegrity 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 `/opt/dcelocal/dcesetup.log` for more information.

If the procedure is completed successfully, the Modify Configuration Menu is redisplayed.

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