

Telelogic Synergy
Installation Guide for UNIX
Release 7.0

Before using this information, be sure to read the general information under “Appendix C: Notices” on page 67.

This edition applies to **VERSION 7.0, Telelogic Synergy Installation Guide for UNIX (product number 5724V66)** and to all subsequent releases and modifications until otherwise indicated in new editions.

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Table of Contents

Chapter 1: Introduction	1
Readme	1
Upgrade from a previous release	1
Release summary	2
Interfaces installed by Telelogic Synergy 7.0.....	2
Release compatibility	3
User prerequisites	3
Contacting IBM Rational Software Support	3
Product support	4
Other information	4
Conventions used in this guide.....	4
Shell conventions	4
Command line interface.....	5
Default text editor	5
Fonts and symbols	5
Telelogic Synergy documentation.....	6
Chapter 2: Terms and Concepts	7
Chapter 3: Telelogic Synergy Installation Worksheet	9
Print and complete the worksheet	9
Chapter 4: Pre-Installation	15
Checklist	15
Print the worksheet.....	15

Plan the installation	15
Installation machine requirements	16
Database server and engine machine requirements	17
Client machine requirements	18
Installation directories	19
Disk space requirements	21
Routing, services, hosts, passwords, and groups	23
Prepare the Telelogic Synergy installation machine	25
Set up ccm_root and informix users and groups	25
Create an installation directory	27
Set up the router service	28
Identify the media drive	29
Prepare the database server	30
Check the kernel parameters for Informix	30
Add Informix services	30
Allow access by Windows clients (optional)	30
Install the Telelogic license server	31
Set up for alternative installations	31

Chapter 5: Installation 33

Checklist	33
Download the software	33
Load the software	34
Complete the installation	36
Set up the Telelogic Synergy environment	36
Create an Informix database server	37
Set up for remote engine hosts (optional)	40
Start the Telelogic Synergy daemons	43

Chapter 6: Post-Installation 45

Checklist	45
Configure for remote processes (optional)	45
Unpack a test database	46

Start a Telelogic Synergy session	47
Download Windows client installations	48
Guidelines for the web-based installation process	48

Appendix A: Informix setup and tuning **49**

Prepare UNIX database servers	49
Create Informix chunk files	49
Check shared memory and semaphore kernel parameters	51
Solaris 10	51
RedHat Enterprise Linux 4.0	51
Add machines and protocols to the sqlhosts files	52
Informix tuning guidelines	53
Partitions	53
Dedicated Informix server	54

Appendix B: Alternative Installations **55**

Create multiple installations of Telelogic Synergy	55
Install onto the primary machine	56
Install multiple releases onto the primary machine	57
Install binary-incompatible versions onto the primary machine	58
Install onto a remote file system	59
Run Telelogic Synergy processes across a network	60
Telelogic Synergy daemon processes	60
Telelogic Synergy databases	60
Install onto a machine running Informix	60
Set up a UNIX client	62
Set up a UNIX client that uses NFS	62
Set up a UNIX client that does not use NFS	63
ESD authentication through PAM	65
Set up the esd client	65

Appendix C: Notices **67**

Trademarks	70
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1

Introduction

This chapter explains what you must know before installing Telelogic[®] Synergy[™] on UNIX[®].

The following information is available:

- “Readme” on page 1
- “Upgrade from a previous release” on page 1
- “Release summary” on page 2
- “User prerequisites” on page 3
- “Contacting IBM Rational Software Support” on page 3
- “Contacting IBM Rational Software Support” on page 3
- “Conventions used in this guide” on page 4
- “Telelogic Synergy documentation” on page 6

Readme

The *Readme* file contain vital information about your Telelogic Synergy software, including information about new features in this release, and a list of the supported hardware and operating systems. Review this information before installing your software. The *Readme* is available on the Telelogic Synergy Support site at <https://support.telelogic.com/synergy>. For more information about obtaining documents, see “Telelogic Synergy documentation” on page 6.

Note If necessary, the *Readme* is revised and reissued to provide the most current information. To ensure you have the latest version, download an electronic copy from the Telelogic Synergy Support site.

Upgrade from a previous release

Existing Telelogic Synergy servers and databases can be upgraded to the current release of Telelogic Synergy. The upgrade process is described in the *Telelogic Synergy Upgrade Instructions for UNIX*. These instructions are available on the Telelogic Synergy Support site (<https://support.telelogic.com/synergy>).

Release summary

For a synopsis of the new features of Telelogic Synergy release 7.0, see the *Readme*.

Interfaces installed by Telelogic Synergy 7.0

Telelogic Synergy for UNIX offers the following graphical user interfaces.

- **Telelogic Synergy**

This interface was formerly called Telelogic Synergy for Developers. It is for users in the *developer* or *build_manager* role. It contains functionality for daily development and build management activities.

- **Telelogic Synergy Classic**

This interface is also called the Original client and contains functionality for build managers and CM administrators.

Release compatibility

The following are important characteristics of this release:

- In order for Telelogic Synergy to run, the client, engine, and database must all be from the same release and service pack; you cannot mix components from different Telelogic Synergy releases or service packs.
- In order for Telelogic Synergy to run, you must install the Telelogic License server.
- Windows clients may be used with both UNIX and Windows servers.
- UNIX clients may only be used with UNIX servers.
- UNIX clients and servers can share a single installation if the install directory is accessible across the network.

Telelogic Synergy 7.0 is compatible with Telelogic Change 5.1 or later. If you are already using Telelogic Change, you must upgrade to Telelogic Change 5.1 or later at the same time as you upgrade to Telelogic Synergy 7.0.

User prerequisites

This guide is for Change Management (CM) Administrators who need to install Telelogic Synergy. You must have experience installing software onto a UNIX system and setting up UNIX system files. For deployment planning, you should read the *CM Live* document.

In addition, you must have:

- *root* access on each machine where Telelogic Synergy will be installed, and database server and engine server machines.
- Knowledge of your company's hardware infrastructure and network topology.
- A working knowledge of how your company will use Telelogic Synergy. For example, will you want to configure your installations for remote builds?

Contacting IBM Rational Software Support

Support and information for Telelogic products is currently being transitioned from the Telelogic Support site to the IBM Rational Software Support site. During this transition phase, your product support location depends on your customer history.

Product support

- If you are a heritage customer, meaning you were a Telelogic customer prior to November 1, 2008, please visit the [Synergy Support Web site](#).

Telelogic customers will be redirected automatically to the IBM Rational Software Support site after the product information has been migrated.

- If you are a new Rational customer, meaning you did not have Telelogic-licensed products prior to November 1, 2008, please visit the [IBM Rational Software Support site](#).

Before you contact Support, gather the background information that you will need to describe your problem. When describing a problem to an IBM software support specialist, be as specific as possible and include all relevant background information so that the specialist can help you solve the problem efficiently. To save time, know the answers to these questions:

- What software versions were you running when the problem occurred?
- Do you have logs, traces, or messages that are related to the problem?
- Can you reproduce the problem? If so, what steps do you take to reproduce it?
- Is there a workaround for the problem? If so, be prepared to describe the workaround.

Other information

For Rational software product news, events, and other information, visit the [IBM Rational Software Web site](#).

Conventions used in this guide

The conventions used in this guide are described in the following sections.

Shell conventions

All command-line instructions and examples are shown for the standard Bourne shell, `/bin/sh`. If you use another shell, such as the C shell, you must modify your commands accordingly.

For example, add `/usr/local/ccm70` to the path using the `sh` shell as follows:

```
$ PATH=/usr/local/ccm70/bin:$PATH; export PATH
```

Add `/usr/local/ccm70` to the path using the `csh` shell as follows:

```
% setenv PATH /usr/local/ccm70/bin:$PATH
```

Command line interface

The command line interface (CLI) is supported on all UNIX platforms. You can execute any Telelogic Synergy command from the command prompt.

Prompt

This guide uses the dollar-sign prompt (\$).

Options delimiter

Telelogic Synergy supports the dash option delimiter (-) for all UNIX platforms.

Location of \$CCM_HOME

\$CCM_HOME is the Telelogic Synergy product installation directory. This guide sometimes uses the *ccm_home* variable to represent \$CCM_HOME.

Default text editor

The default Telelogic Synergy UNIX text editor is vi. You can change the default text editor as described in “Default Settings” in the Telelogic Synergy CLI help. For more information about online help, visit the Telelogic Synergy Support site at <https://support.telelogic.com/synergy>.

Fonts and symbols

The table below describes the typeface and symbol conventions used in this guide.

Typeface	Description
<i>Italic</i>	Used for book titles and terminology. Also designates names of roles (<i>developer</i>), states (<i>working</i>), groups (<i>ccm_root</i>), and users (<i>john</i>).
Bold	Used for items that you can select and menu paths, also used for emphasis.
Courier	Used for commands, filenames, and directory paths. Represents command syntax to be entered verbatim. Signifies computer output that displays on-screen. Also used for the names of attributes (<code>modify_time</code>), commands (<code>ccm start</code>), functions (<code>remote_type</code>), and types (<code>csrc</code>).
<i>Courier Italic</i>	Represents values in a command string that you supply. For example, (<code>database_path/username/commands</code>)

This document also uses the following conventions:

Note Contains information that should not be overlooked.

Caution Contains critical information that must be observed or damage to the database or system could result.

Telelogic Synergy documentation

Unless otherwise noted, Telelogic documents are available on the Telelogic Synergy Support site (<https://support.telelogic.com/synergy>), and on the Documentation shipped with Telelogic Synergy.

Note You must provide a user name and password to enter the Telelogic Synergy Support Site. If you do not have a user name and password, click **Cancel** when prompted for these items, and follow the on-screen instructions to obtain them.

2

Terms and Concepts

To perform the operations described in this guide, you should first understand the following terms and concepts.

Telelogic Synergy client A *Telelogic Synergy client* is a user interface process.

Telelogic Synergy database

A *Telelogic Synergy database* is an object-oriented repository that stores controlled files, change requests, and their properties. A file's properties include the file's source and creation date, and many other properties such as its relationship to other files.

Telelogic Synergy database server

The *database server* hosts the Telelogic Synergy databases and chunk files.

Telelogic Synergy CCM server

The *Telelogic Synergy CCM server* hosts the web-based Telelogic Synergy help, the Windows client installation image, . For details on the Telelogic Synergy CCM Server, see "CCM Server Administration" in the *Telelogic Synergy Administration Guide for UNIX* .

engine server

An *engine server* hosts the engine processes that communicate between the Telelogic Synergy client and the Telelogic Synergy Informix database.

ESD

The *ESD* (Engine Startup Daemon) is an optional secure method for starting a user's Telelogic Synergy traditional mode session. ESD is not used for web

	mode sessions. If you decide to use ESD, you must run one ESD on each engine host.
installation machine	The <i>installation machine</i> hosts the Telelogic Synergy and Informix executables.
object registrar	The <i>object registrar</i> “registers” all changes made to Telelogic Synergy database objects so that each user’s view of the database remains up to date. You must run one object registrar per database host.
router	The <i>router</i> manages the communications among Synergy processes. You must run one router per network installation.
Telelogic license server	The <i>license server</i> validates users’ access to Telelogic Synergy databases. FLEXnet is used to manage licenses. You must run one license manager per network installation, and only on the machine for which Telelogic issued the license.
Traditional mode	Standard network communication for users who need administration. Traditional mode behaves as it did in Telelogic Synergy 6.5.
Web mode	Web mode Telelogic Synergy clients communicate to a Web-based Telelogic Synergy server using the HTTP protocol. This architecture reduces the dependency on network latency by using parallel, asynchronous network communication between the client and server.
work area	A <i>work area</i> is a location in your file system to which Telelogic Synergy copies files when you check them out. Your work area can reside anywhere in the network file system. As you update files, Telelogic Synergy synchronizes changes in the work area with the database. If you are using a UNIX work area, the files can be either copies or links. If you are using a Windows work area, the files can only be copies.

3

Telelogic Synergy Installation Worksheet

Print and complete the worksheet

Use the following worksheet to organize the information you need to install Telelogic Synergy.

To make your installation easier, print a copy of the worksheet and enter information for all possible items before starting. You will enter other items during the installation.

Save the worksheet after completing the installation; this is valuable reference information.

1. Telelogic Synergy installation machine (*ccm_install_server*)

This is the machine onto which the Telelogic Synergy executables will be installed. For more information, see “Installation machine requirements” on page 16 and “Prepare the Telelogic Synergy installation machine” on page 25.

Default: None

Actual: _____

2. Telelogic Synergy database server (*ccmdb_server*)

This is the machine on which the Telelogic Synergy databases will reside. For more information, see “Database server and engine machine requirements” on page 17 and “Prepare the database server” on page 30. This machine might be the same as the installation machine (*ccm_install_server*, item 1). Also see “Start a Telelogic Synergy session” on page 47 for information on daemons.

Default: None

Actual: _____

3. *ccm_root* home directory (*ccm_root_home*)

This is *ccm_root*'s home directory path on the installation machine. For more information, see “Set up *ccm_root* and informix users and groups” on page 25.

Use Default: None

Use Path: _____

4. *informix* home directory (*informix_home*)

This is the *informix* home directory path on the installation machine. For more information, see “Set up *ccm_root* and *informix* users and groups” on page 25.

Default Path: None

Actual: _____

5. Telelogic Synergy installation directory or \$CCM_HOME (*ccm_home*)

This is the directory into which Telelogic Synergy will be installed. For more information, see “*ccm_home*” on page 19, and step 3 on page 34. This should **not** be the same as or under *ccm_root*’s home directory (*ccm_root_home*, item 3). For information on using a release-specific directory, see “Create an installation directory” on page 27.

Default Path: None

Actual: _____

6. Media device name (*media*)

This is the path to the mount point of the media drive on the installation machine, or a temporary directory set up by you for downloadable installations. For more information, see “Identify the media drive” on page 29, and step 2 on page 34.

Default Path: None

Actual: _____

7. Chunk files directory path or raw device name (*informix_chunkfiles*)

This is the path to the Informix chunk files. For more information, see “*informix_chunkfiles*” on page 19, step 3 on page 38, and “Create Informix chunk files” on page 49.

Default Path: /data/informix_dbs

Actual: _____

8. Database path (*ccmdb*)

This is the path to the Telelogic Synergy database. For more information, see “ccmdb” on page 19. This should **not** be the same as or under either *ccm_root*’s home directory (*ccm_root_home*, item 3) or *ccm_home*, item 5.

Default Path: None

Actual: _____

9. Router service host name (*router_host*)

This is the name used for the Telelogic Synergy router host. You should install Telelogic Synergy on this machine first. For more information, see “Set up the router service” on page 28, and the end of “Set up the Telelogic Synergy environment” on page 36.

Default: *system name*

Actual: _____

10. Router service name (*router_service*)

This is the name used for the Telelogic Synergy router service. For more information, see “Set up the router service” on page 28.

Default: *ccm7.0_router*

Actual: _____

11. Router service port number (*router_port*)

This is the router port used for the *router_service*. For more information, see “Set up the router service” on page 28.

Default: 5412 (reserved)

Actual: _____

12. ESD port number (*esd_port*)

This is the port used for the Engine Startup Daemon. The port number must be a value that is not already in the system *services* file.

Default: 8830

Actual: _____

13. Telelogic Synergy primary ccm server host (*primary_server_host*)

This machine on which the primary server will run. This must be the same as the router server host name (number 9 in this worksheet).

Default: *system name*

Actual: _____

14. Telelogic Synergy primary ccm server port number

(*primary_server_port*)

This is the port used for accessing the web-based product help. The web server will use this port, and this port + 100. The port numbers must be values that are not already in use.

Default: 8400 (and thus 8500)

Actual: _____

15. Telelogic license service host (*license_serverhostname*)

This is the name of the host where the license server is installed. For more information, see the section “Setting up your server license” in the *Telelogic Lifecycle Solutions Licensing Guide*.

Default: None

Actual: _____

16. Telelogic license service port number (*license_server_port*)

This is the port number used by the license server host. For more information, see the section “Setting up your server license” in the *Telelogic Lifecycle Solutions Licensing Guide*.

Default: None

Actual: _____

17. Informix service name (*servername_serverhostname*)

This is the Informix[®] database server service name. For more information, see “Add Informix services” on page 30.

Default: None

Actual: _____

18. Informix service port number (*informix_port*)

This is the Informix port used for the Informix database server service. For more information, see “Add Informix services” on page 30.

Default: None

Actual: _____

19. Informix server number (*_server_num*)

This is the number of an Informix server that you will be creating. You should only use *server_num* values from 1 to 255. By default, the server number is 1. If you install multiple Informix servers on the same machine, you must use a different number for each server. For more information, see step 5 on page 39. If appropriate, also see “Install onto a machine running Informix” on page 60.

Default: 1

Actual: _____

20. Informix server name (*servername*)

This is the name of an Informix server that you will be creating. By default, the Server Name is the name of the machine on which the Informix server is installed. If you install multiple Informix servers on the same machine, you must give each server a different name. For more information, see step 5 on page 39. If appropriate, also see “Install onto a machine running Informix” on page 60.

Default: Name of the machine on which the Informix server is installed

Actual: _____

4

Pre-Installation

This chapter describes how to prepare your system for Telelogic Synergy software installation. Work through this chapter carefully. It will help you make decisions during your installation.

Checklist

Use the following checklist, in the sequence shown, to work through this chapter:

- “Print the worksheet” on page 15
- “Plan the installation” on page 15
- “Prepare the Telelogic Synergy installation machine” on page 25
- “Prepare the database server” on page 30
- “Install the Telelogic license server” on page 31
- “Set up for alternative installations” on page 31 (This is an optional step.)

Print the worksheet

Before proceeding, print the *Telelogic Synergy Installation Worksheet*. Fill in the worksheet as you work through this chapter. Your answers will be needed during the installation process, and the written worksheet will form a valuable record of your installation decisions.

Plan the installation

Read these installation instructions carefully, and review the *Readme*. For information about accessing the latest version of the *Readme*, see page 1. If you are upgrading from a previous release, read the *Telelogic Synergy Upgrade Instructions*.

If you are installing Telelogic Synergy on multiple machines or platforms (for example, on both UNIX and Windows), install it first on the machine where you will run the Telelogic Synergy router.

Plan your UNIX installations as directed in the sections that follow.

Installation machine requirements

The installation machine hosts the Telelogic Synergy and Informix executables. The table below shows the disk space requirements of this device when installed.

Note You should have three times as much disk space available during installation to allow for extraction of files.

Make sure that your machine characteristics are compatible with those in this table.

Machine Characteristics	Minimum Configuration
Hardware and Operating System	See the <i>Readme</i> for the list of supported systems
Disk Space	For Solaris: 750 MB For AIX: 650 MB For Linux: 600 MB

Linux installations must have the `compat-libstdc++` package installed. If you receive errors while running `ccmsrv create`, you are probably missing this file. You can find it on the Red Hat installation CD. The error will be similar to:

```
WARNING: unable to initialize the database server
see logfile_location.log for details
/database_path/informix/bin/oninit:error while loading shared
libraries: libstdc++:cannot open shared object file: No such
file or directory
```

Database server and engine machine requirements

Database server machines host the Informix chunk files (see “informix_chunkfiles” on page 19). The engine machine hosts the engine processes that access the Informix and file system portions of your system. You should run the engine processes on the database server machine unless your site is running so many sessions that the engine sessions slow down the server unacceptably. The following table shows the minimum requirements for the server and engine machine. Your installation may require more than the amounts shown in these tables, depending on the number of simultaneous users you have.

Note For the latest information on server resource requirements, see the *Readme*. For details about Informix database server requirements, see “Appendix B: Informix Setup” in the *Telelogic Synergy Administration Guide for UNIX*.

Machine Characteristics	Minimum Configuration
Hardware and Operating System	See the <i>Readme</i> for the list of supported systems
CPU	2 GHz quad CPU or better
Memory (per machine)	2 GB and 25 MB per concurrent session.
Swap Space (per machine)	3 times physical RAM per database server
Repository DB Space	2 GB raw partition
Kernel Parameters	See “Check Shared Memory and Semaphore Kernel Parameters” in the <i>Telelogic Synergy Administration Guide for UNIX</i> .
Required Additional Software	The <code>tsort</code> command must be in the path

Client machine requirements

Each user must run a Telelogic Synergy interface, and must have access to one or more file systems that can be used for the user's work area(s). The table below shows the minimum requirements for client machines. Your installation may require more than the amounts shown in this table.

Note Each user's work area must be a directory owned and writable by the user. By default, this directory is placed under \$HOME for each user. The directory must be visible to all build/compile servers.

Machine Characteristics	Minimum Configuration
Hardware and Operating System	See the <i>Readme</i> for the list of supported systems
CPU	1.5 GHz dual CPU or better
Memory (per machine)	2 GB
Swap Space (per machine)	3 times physical RAM
Browser	See the <i>Readme</i> for the most current list of supported browsers.
Windowing System	X11R4 or better

Note An alternative to installing a UNIX client is to install a Windows client. See the *Telelogic Synergy Installation Guide for Windows*.

Installation directories

This section describes the directories used to install Telelogic Synergy (that is, *ccm_home*, *informix_chunkfiles*, and *ccmdb*).

- *ccm_home*

In this guide, the *ccm_home* variable represents the path to the Telelogic Synergy installation. The default installation directory is `/user/local/ccm`. The installation includes both Telelogic Synergy and Informix executables. The Informix executables are in the *informix* directory, under `$CCM_HOME`.

Note This guide sometimes uses the `$CCM_HOME` variable to represent *ccm_home*.

You must be able to write to *ccm_home* as user *root*. If the file system is on a local disk, you should be able to install the Telelogic Synergy software without changing your mount options.

For more information, refer to "Installation machine requirements" on page 16, specifically for disk space requirements for this directory.

Write your value for *ccm_home* in item 5 on the worksheet on page 10.

- *informix_chunkfiles*

In this guide, the *informix_chunkfiles* variable represents the path to the Informix chunk files (dbspace) on the server.

The chunk file directory must be on the Informix server and must be a local file system. Your chunk file paths must be fewer than 66 characters. Use raw disks for chunk files (for more information, see "Create Informix chunk files" on page 49).

Note You can use NFS file systems for databases and work areas, but not for chunk files. If you use NFS file systems for databases and work areas, NFS attribute caching must be turned OFF. For an explanation of the root access issues related to installing Telelogic Synergy, see "Install onto a remote file system" on page 59.

Write your value of *informix_chunkfiles* in item 7 on the worksheet on page 10.

- *ccmdb*

In this guide, the *ccmdb* variable represents the path to the Telelogic Synergy database directory on the server. Individual databases reside in this directory.

The databases in the *ccmdb* directory must be visible to all engine hosts that will access those databases and must, therefore, be either local or mounted across the network. The databases must also be visible (that is, use the same logical path) on machines running Telelogic Synergy processes.

Note You should separate programs and data as follows: Install Telelogic Synergy software into one directory, install the database server chunk files into a different directory, then create the Telelogic Synergy databases into another directory when you unpack a database.

Write your value for *ccmdb* in item 8 on the worksheet on page 11.

Disk space requirements

The following table shows how to allocate disk space on your server.

The Informix server limits the size and offset of each chunk file to 2 GB. To work around this, break up your raw device into many partitions of 2 gigabytes.

Database Directories	Space Required
<i>ccm_home</i> (installation)	750 MB See “Installation machine requirements” on page 16.
<i>informix_chunkfiles</i> (data files) Be sure to allow for growth when you allocate disk space for this directory. This is where all metadata is stored. For more information, see “Create Informix Chunk Files” in the <i>Telelogic Synergy Installation Guide for UNIX</i> .	40 users (default) 200 MB
<i>ccmdb</i> Starting size per database: 3 x the total size of all objects to be controlled. Note Be sure to allocate generous disk space for the <i>ccmdb</i> directory. This is where all controlled file content is stored and where the database typically grows the most. This space might grow much larger, depending on the number of versions maintained, particularly if the versions are binaries.	3 x _____ MB = _____ MB
Total Minimum Disk Space Needed (<i>ccm_home+informix_chunkfiles + ccmdb</i>)	_____ MB

Note On some UNIX systems, NFS caches are not updated even as a result of local activity. This can cause problems if you run an interface and engine on some UNIX systems with the

file system part of the Telelogic Synergy database NFS-mounted from another system. To solve this problem, mount the *ccmdb* database file system with NFS caching disabled.

Routing, services, hosts, passwords, and groups

The following table shows the routing, services, hosts, passwords, and groups files used to run Telelogic Synergy.

Purpose	Product	Using NIS	Not Using NIS
Routing	Telelogic Synergy	master <code>services</code> file on the NIS server for each network entry: <code>ccm7.0_router</code>	<code>/etc/services</code> on every Telelogic Synergy machine for each network entry: <code>ccm7.0_router</code>
Services	Informix	master <code>services</code> file on the NIS server entries: <code>servername_serverhostname</code> for each dbserver	<code>/etc/services</code> on each dbserver and engine host using that dbserver entries: <code>servername_serverhostname</code> for each dbserver engine host
Passwords	Telelogic Synergy	master <code>passwd</code> file on the NIS server	<code>/etc/passwd</code> (and <code>/etc/shadow</code>) file on each dbserver
Groups	Telelogic Synergy	master <code>group</code> file on the NIS server	<code>/etc/group</code> (and <code>/etc/shadow</code>) file on each dbserver

Purpose	Product	Using NIS	Not Using NIS
Hosts	Telelogic Synergy	master <code>hosts</code> file on the NIS or DNS server entries: the <code>dbserver</code> and each engine host	/ <code>etc/hosts</code> on every machine running Telelogic Synergy entries: the <code>dbserver</code> and each engine host
		master <code>hosts.equiv</code> on the NIS server, or <code>ccm_root's .rhosts</code> file entries: <code>dbserver</code> and each engine host for users <code>ccm_root</code> and <code>informix</code>	/ <code>etc/hosts.equiv</code> on each <code>dbserver</code> , or <code>ccm_root's</code> and <code>informix's .rhosts</code> files entries: <code>dbserver</code> and each Informix engine host for users <code>ccm_root</code> and <code>informix</code>
	Informix	<code>ccm_home/informix/etc/sqlhosts</code> on the installation machine (For more information, see “ <code>ccm_home</code> ” on page 19.) entries: <code>servername</code> and <code>servername_net</code> for each <code>dbserver</code> host	same as using NIS
	DCM (and Telelogic Synergy platform attribute)	<code>ccm_home/etc/om_hosts.cfg</code> <code>ccm_home/etc/remexec.cfg</code> (For more information, see “Set Up for Remote Command Execution” in the <i>Telelogic Synergy Administration Guide</i> .)	same as using NIS

Prepare the Telelogic Synergy installation machine

Use this information to prepare your Telelogic Synergy installation machine.

Set up *ccm_root* and *informix* users and groups

User *ccm_root* and user *informix* are the two administrative users. User *ccm_root* owns most of the files and directories, and is the user with permissions to run the administrative commands for Telelogic Synergy. User *informix* is used by the Informix software to perform administrative tasks governing the database server activities. You must have these users and groups defined to install Telelogic Synergy.

Note If you are not using NIS, you must do the following: Set up *ccm_root* and *informix* users and groups on each engine host, using the same numeric user and group IDs on every machine.

Place the *ccm_root* and *informix* home directories wherever appropriate for your site.

Note You should not install the software into *ccm_root*'s home directory.

Perform the user and group setup as user *root*.

1. Create the *ccm_root* and *informix* users.
2. Create the *ccm_root* and *informix* groups.

Make *ccm_root* a member of group *ccm_root*, and user *informix* a member of group *informix*. Group *informix* must be the primary group for the user *informix*.

To the *ccm_root* group, add the names of any users who will have the *build_mgr* (build manager) role.

3. If you are running Telelogic Synergy on an Linux platform, link */etc/login/group* to the */etc/group* file.
4. Create *ccm_root* and *informix* home directories. Write the value for *ccm_root_home* in item 3, and write the value of *informix_home* in item 4, on the worksheet on page 9.

Note Be sure that the *informix_home* home directory is not the same as the *informix_chunkfiles* directory.

The following examples include */users/ccm_root* and */users/informix*:

```
root# mkdir /users/ccm_root
root# chown ccm_root /users/ccm_root
root# chgrp ccm_root /users/ccm_root
root# chmod 755 /users/ccm_root
root# mkdir /users/informix
root# chown informix /users/informix
root# chgrp informix /users/informix
root# chmod 755 /users/informix
```


Create an installation directory

You must create an installation directory to install Telelogic Synergy. The installation directory path is `ccm_home`, as described in “`ccm_home`” on page 19.

The installation directory can be anywhere, and have any name. However, you should install each Telelogic Synergy release into a release-specific directory (such as `/usr/local/ccm70`), then link `/usr/local/ccm` to your current default release. This allows you to have more than one installation of Telelogic Synergy on a machine, which may be necessary if you are upgrading to a new release.

For example, if you have a previous Telelogic Synergy installation in the `/usr/local/ccm65` directory, install the new version into `/usr/local/ccm70`, then link `/usr/local/ccm` to `/usr/local/ccm70`.

Note For more information about multiple installations, see “Create multiple installations of Telelogic Synergy” on page 55.

Record the path to this directory in item 5 on the worksheet on page 10.

To create an installation directory, do the following:

1. Log into the installation machine as user `root`.
2. Create the installation directory.

```
root# mkdir ccm_home
root# chown ccm_root ccm_home
root# chgrp ccm_root ccm_home
root# chmod 755 ccm_home
root# ln -s ccm_home /usr/local/ccm
```

Note The installation directory must be visible from the client machine, or a local client must be installed, as discussed in “Set up a UNIX client” on page 62.

Set up the router service

Telelogic Synergy requires a dedicated TCP port for its router service. To reserve this port, add a Telelogic Synergy router service entry to the `/etc/services` file or its NIS equivalent (for more information, see “Routing” in the table on page 23). You must edit the `services` file as user `root`.

The router service entry in the `/etc/services` file has the following syntax:

```
router_service router_port/tcp # comment
```

The following is the optimal `/etc/services` router service entry:

```
ccm7.0_router 5412/tcp # Telelogic Synergy router port
```

The first column is the service name, which should be `ccm7.0_router`. The second column starts with the port number, which can be any unallocated, unreserved port. On most systems, port numbers in the range of 0 to 1023 are reserved (privileged). If port 5412 is not in use, you should use it because it is reserved for Telelogic Synergy by the Internet Assigned Number Authority (IANA).

Write the following on the worksheet on page 9:

- the router service host name in item 9 (the default is your `system_name`)
- the unique router service name in item 10
- the unique router service port number in item 11

You will need this information during installation. If you do not have a dedicated port defined when you install Telelogic Synergy, the installation program will prompt you to choose one.

Note For heterogeneous installations, you need only one Telelogic Synergy router process if the `ccm_home/etc` directory is linked to a single location. Even so, you must have separate Telelogic Synergy router processes for separate releases and for separate networks. For more information, refer to “Create multiple installations of Telelogic Synergy” on page 55.

You can also run the router on a Windows machine. For more information, see the *Telelogic Synergy Installation Guide for Windows*.

Identify the media drive

Determine the device name of the installation machine's media drive, and enter the name in item 6 on the worksheet on page 10. You must know the drive location to install Telelogic Synergy.

Note On some systems, the media device may be mounted automatically when you insert the media. On such systems, you need not issue a mount command. However, you must know the directory in which the media is mounted (that is, *media*).

If you are downloading the software, please see "Download the software" on page 33 for more information.

Prepare the database server

Use this information to prepare your Informix database server.

Note The server machine can be the same as the installation machine.

Check the kernel parameters for Informix

For each database server, be sure that the shared memory and semaphore kernel parameters meet the current Telelogic Synergy requirements (see “Check shared memory and semaphore kernel parameters” on page 51 for the minimum parameter values). Consult your system administrator if you need help setting these values.

Add Informix services

Before creating a database server, you must define the database server’s service in the `/etc/services` file or its NIS equivalent (for more information, see “Services” in the table on page 23). You must edit the `services` file as user root.

The `services` entry for the database server has the following syntax:

```
servername_serverhostname informix_port/tcp # comment
```

The first column is the Informix database server service name; write this name in item 17 on the worksheet on page 13. The second column starts with the informix service port number; write this number in item 18 on the worksheet on page 14.

Allow access by Windows clients (optional)

For Windows traditional mode clients to be able to connect to a UNIX database server without using ESD, you must verify that the `rexec` daemon is enabled in the `inetd` configuration file on each UNIX database server or engine machine that will be accessed by Windows clients. **The location of this configuration file may vary depending on the platform on which you are running.** If you are using web mode or a secure engine connection with ESD, it does not matter whether the `rexec` daemon is enabled.

Install the Telelogic license server

Telelogic Synergy uses the Telelogic License Server. The Telelogic™ License Server® is a FLEXnet-based license server used to manage licenses. You must install the Telelogic License Server separately from the product installation process documented here in order to run Telelogic Synergy, even if you are not running other Telelogic products. You should install the Telelogic License Server before you perform the Telelogic Synergy product installation.

For complete information about installing the license, see the *Telelogic Lifecycle Solutions Licensing Guide*. This document is available from the Telelogic Lifecycle Solutions kit or can be downloaded from the Lifecycle Solutions section of the Support web site at (<http://support.telelogic.com/lifecyclesolutions>).

Set up for alternative installations

For information on setting up alternative installations, see “Appendix B: Alternative Installations” on page 55.

5

Installation

This chapter explains how to install Telelogic Synergy on a UNIX platform.

Note To install Telelogic Synergy, you will need the “Telelogic Synergy Installation Worksheet” on page 9 that you completed during pre-installation.

Checklist

Use the following checklist, in the sequence shown, to install Telelogic Synergy:

- “Download the software” as described below
- “Load the software” on page 34
- “Complete the installation” on page 36
- “Create an Informix database server” on page 37
- “Start the Telelogic Synergy daemons” on page 43

Download the software

Use the following procedure to extract and install download images from the Telelogic Synergy web site.

1. Create a temporary directory on a file system with at least 750 MB of disk space; this is in addition to the space required for the installed software as documented in this guide.

```
mkdir /tmp/synergy_image
```
2. On the Telelogic Synergy support site, find the Telelogic Synergy 7.0 downloads page (for support information, see “Product support” on page 4). You will see a single file for each platform; each file is a gzipped tar archive of the Telelogic Synergy installation image for that platform. Download the file or files you need into your temporary directory.

Extract the installation image:

```
cd /tmp/synergy_image  
cat download.tar.gz | gzip -d | tar xf -
```

3. Proceed with the installation as directed in “Load the software”, as if the temporary directory was your DVD mount point. Add any other flags required by the installation or upgrade procedure you are following.

```
/tmp/synergy_image/ccm/unix/bin/ccm_install -x -d  
ccm_home
```

4. After installation is complete, remove the temporary directory and its contents.

```
cd /rm -rf /tmp/synergy_image
```

Load the software

Load the Telelogic Synergy software as follows:

Note If you are installing Telelogic Synergy on a non-local file system, read “Install onto a remote file system” on page 59 before proceeding.

1. Log on to the installation machine as user *root*.
2. Mount the installation media. Your system may auto-mount the DVD, if not, use the appropriate mount command shown in the following table.

Platform	Command
Solaris	<code>mount -r -F hsfs /dev/sr0 /cdrom</code>
AIX	<code>mount /cdrom</code>
Linux	<code>mount /media/cdrom</code>

Note If your DVD is mounted automatically, you need to know the directory in which the media is mounted (that is, *media*, which is item 6 on the worksheet on page 10).

3. Run the installation program (`ccm_install`).

Note Installation requires *root* access to the Telelogic Synergy installation directory (*ccm_home*). If the installation directory is on an NFS file system, be sure that its path was exported with *root* access to the machine where you are performing the installation.

You must run `ccm_install` either on the same machine type as the binaries you are installing, or on a different machine type using the `-p [platform]` flag to designate the type of binary. If you are using the `-p`

flag, you must use one of the arguments shown in the following table for the flag.

Platform	Attribute Value
Sun	solaris
AIX	ibm or aix
Linux	linux

The `ccm_install` program installs into either `$CCM_HOME` or the directory specified with the `-d` (destination directory) option. For more information about the `-d` option, see “Install onto a remote file system” on page 59.

If you are using the Bourne shell, the commands for setting the environment variables and executing the install command are as follows:

```
root# CCM_HOME=ccm_home; export CCM_HOME
root# PATH=$CCM_HOME/bin:$PATH; export PATH
root# /media/ccm/unix/bin/ccm_install -x
```

Use the values for `ccm_home` and `media` that you entered in items 5 and 6 on the worksheet on page 10.

Note You will be prompted to accept the software license agreement. If you do not agree, the installation will be terminated. You must agree in order to complete the installation.

The `ccm_install` program will prompt you for the router service host name, router service name, router service port number, ESD (engine startup daemon) port number, CCM server port number, license server host name, and license server port number. To answer these prompts, refer to items 9 to 16 on the worksheet on page 11.

Complete the installation

After you successfully run the `ccm_install` program, the following message displays:

```
ccm_install: Telelogic Synergy installation succeeded
```

Do the following, in the sequence shown, to complete the installation:

- “Set up the Telelogic Synergy environment” described below
- “Set up for remote engine hosts (optional)” on page 40

Set up the Telelogic Synergy environment

To set up the Telelogic Synergy environment for X applications, `CCM_HOME`, and `PATH`, do the following:

1. Copy the X application defaults file for Telelogic Synergy to the `app-defaults` directory on all machines that run clients (interface processes).

All Sun Solaris platforms using Open Windows:

```
root# cp $CCM_HOME/etc/Ccm /usr/openwin/lib/app-defaults
```

All other platforms including Sun Solaris using CDE:

```
root# cp $CCM_HOME/etc/Ccm /usr/lib/X11/app-defaults
```

If your environment is mixed, copy the file for both the OpenWindows and the non-OpenWindows platforms.

2. **On Sun OpenWindows only**, check to see if the X11 translation table is already installed. If it is not, copy the X11 translation table.

```
root# cp $CCM_HOME/etc/XKeysymDB /usr/openwin/lib
```

3. Set `ccm_root` and `informix` environment variables.

Some Telelogic Synergy commands require the `tsort` command in the path. Check your installation to see if you need to modify the path to include `tsort`. For example, on Solaris `tsort` is in `/usr/ccs/bin`.

- a. Set the command path for user `ccm_root`.

```
$ su - ccm_root
Password: *****
$ vi .profile
```

If the `.profile` file is not the correct file for your shell, edit the correct file (for example, `.cshrc` or `.login`).

Add the following lines, then exit from user `ccm_root`.

```
CCM_HOME=ccm_home; export CCM_HOME
PATH=$CCM_HOME/bin:$PATH:/usr/ccs/bin; export PATH
exit
```

- b. Set the command path for user *informix*.

```
$ su - informix
Password:*****
$ vi .profile
```

If the `.profile` file is not the correct file for your shell, edit the correct file.

Add the following lines, then exit from user *informix*.

```
CCM_HOME=ccm_home; export CCM_HOME
PATH=$CCM_HOME/bin:$CCM_HOME/informix/bin:$PATH:/usr/ccs/bin
export PATH
$ exit
```

Create an Informix database server

Create at least one Informix database server.

You can create a database server on the installation machine or on a remote host. Installers often create a database server on the installation machine; however, you are not required to do so. You can make any host a database server if the machine meets the system requirements and a valid installation directory for that platform is visible (for example, local or NFS-mounted).

For example, if the installation directory for Solaris is `/usr/local/ccm70` on the *solaris1* machine and you want to create a database server on *solaris2*, you can NFS-mount the installation directory on *solaris2*, then create a database server on *solaris2*. Creating the database server automatically adds an entry for *solaris2* to the `sqlhosts` file in the `$CCM_HOME/informix/etc` directory.

You can also have a database server run server processes for a different type of platform. For more information, see “Add machines and protocols to the `sqlhosts` files” on page 52.

Note If you create the database server on a different machine than the installation machine, be sure that the database server is correctly configured. For more information, see “Routing, services, hosts, passwords, and groups” on page 23.

1. Log on to the database server machine as user *root*.

If your database server machine is the same as your installation machine, you are already logged on as *root*.

2. If your database server machine is not the same as your install machine, you must run `ccm install -l`.
3. Create a directory for the Informix dbspace (`chunk files`). See item 7 on the worksheet on page 10.

When you create chunk files, keep the following in mind:

- The Informix server limits the size and offset of each chunk file to 2 GB. To work around this, break up your raw device into many partitions of 2 gigabytes.
- Place the chunk files where no one will remove them. If chunk files are moved, the database server will no longer work, and it might lose data.
- Create the chunk file directory (for example, `/data/informix_chunkfiles`) on the machine where the Informix server will run. Chunk files must not be on network file systems.
- For the best performance and reliability, use raw partitions for Informix chunk files. (See "Raw Partitions" in the *Telelogic Synergy Administration Guide for UNIX*.) In the event of file system corruption, cooked files are affected but raw files are not.
- The names of your chunk files' paths must be fewer than 66 characters.

Caution Do not put the Informix chunk files directory under the installation directory (that is, `ccm_home`), or under the `ccm_root` or `informix` home directory, because these Informix data files should not be backed up as normal UNIX files.

For more information about creating chunk files, see "Create Informix Chunk Files" in the *Telelogic Synergy Administration Guide for UNIX*.

```
root# mkdir informix_chunkfiles
root# chown informix informix_chunkfiles
root# chgrp informix informix_chunkfiles
root# chmod 770 informix_chunkfiles
```

4. Create a directory for the Telelogic Synergy databases (for example, `/data/ccmdb`). See item 8 on the worksheet on page 11.

Caution To avoid losing files when you upgrade, do not put the database directory under the installation directory.

```
root# mkdir ccmdb
root# chown ccm_root ccmdb
root# chgrp ccm_root ccmdb
root# chmod 755 ccmdb
```

5. Create the database server.

If you have already planned specific partitions and sizes, use these paths and sizes to respond to the prompts. For more information, see the *Telelogic Synergy Administration Guide for UNIX*.

If you have not planned specific partitions and sizes, use the directory created in step 3 on page 38 (*informix_chunkfiles*) when prompted for the primary chunk path for the root dbspace. Use the defaults for everything else except the number of users; set this to the expected number of simultaneous users of all databases on this server, rounded up to the nearest 10. Typically, the minimum space required is as follows:

- log, root, and temp dbspaces are each approximately 1.0 MB per user.
- ccm dbspace is approximately 2 MB per user.

For the default of 40 users, the total is approximately 200 MB. This is only a rough estimate for the initial database chunk. In general, generously allocate dbspace to allow for future growth. For more information about allocating disk space, see “Disk space requirements” on page 21, and “Create Informix chunk files” on page 49.

The directory holding chunk files must be owned by *informix*, group *informix*, and mode 770. For more information, see “Create Informix chunk files” on page 49.

When prompted, enter the values for your number of CPUs, number of users, and server number (item 19 on the worksheet on page 14).

Note If you have other Informix installations, either active or inactive, the default server number that `ccmsrv create` attempts to use might already be in use and an error like the following will appear in the log file:

```
11:13:05 shmget: [EEXIST] [17]: key 52574801: shared
memory already exists
11:13:05 mt_shm_init: can't create resident segment
```

Correct this problem by using a different server number (item 19 on the worksheet on page 14).

If you need to increase the size of your shared memory kernel parameters, you might also see an error like the following in the log file:

```
16:53:12 shmat: [EMFILE] [24]: out of shared memory
segments, check system SHMSEG
16:53:12 mt_shm_init: can't create resident segment
```

To learn more about shared memory kernel parameter values, see “Check shared memory and semaphore kernel parameters” on page 51.

Answer “Y” when you are prompted to create the database server. Use the UNIX commands appropriate for your shell.

Note If you have set up raw partitions, you will be prompted for a raw partition path when you execute the `ccmsrv create` command. In such cases, type the path to the device file for that partition. Be sure to reference the correct partition and offset.

```
root# su - informix
Password:*****
$ CCM_HOME=ccm_home; export CCM_HOME
$ PATH=$CCM_HOME/bin:$PATH; export PATH
$ ccmsrv create -s servername
$ exit
```

where:

servername is item 17 on the worksheet on page 13. If you leave out the server name option, the server name will be the same as the host name.

Set up for remote engine hosts (optional)

If you are running Telelogic Synergy engines and the database server on the same machine, you do not need to set up remote engine hosts. However, if you plan to

run engine processes on machines other than the database server, you must define the engine hosts in the following network system files:

- `hosts` (or DNS)
- `hosts.equiv` (or `.rhosts`)

Ensure that your host IP addresses are unique and consistent, and be sure to check access to each host. Additionally, you must run `ccm_install -l` on the engine hosts.

If you do not intend to use the Engine Startup Daemon (ESD) for traditional mode sessions, you must enable the `rsh` and `rexec` daemons by editing the appropriate `inetd` or `xinetd.d` files. On some systems these daemons are disabled by default. For web mode sessions, ESD, `rsh`, or `rexec` daemons are not needed.

For VPN clients, you must add the VPN IP address to `/etc/hosts` or the DNS equivalent. You can give the VPN IP address any name as long as it has a name. An example of the type of entry you can make in your `hosts` file is:

```
192.168.45.10 vpnclient1
192.168.45.11 vpnclient2
192.168.45.12 vpnclient3
```

Alternatively, instruct your DNS server to construct host names spontaneously for reverse lookups of IP addresses in the subnet used for your VPN.

By default, Linux does not interpret the plus sign (+) in either the `.rhosts` file or the `/etc/hosts.equiv` file. If you need to allow the use of +, you must add the argument `promiscuous` at the end of the `.rhosts` `auth` line in `/etc/pam.d/rsh`.

For Linux users, you must also set permissions in the `/etc/hosts.allow` file. Using the setting `ALL:ALL`, which allows any client to use any service, is optimal. However, this setting might raise network security concerns.

For more information, see "Set Up for Remote Command Execution" in the *Telelogic Synergy Administration Guide for UNIX*.

Note You must run the object registrar on your Informix database server if the database server and installation machines are not the same. Also, if the database server is not the same as the installation machine, you must run `ccm_install -l` on the engine hosts.

For more information, see the `ccm_objreg` command in the *Telelogic Synergy Administration Guide for UNIX*.

Note You must run `ccm_server` on each machine on which you intend to run web mode sessions.

Start the Telelogic Synergy daemons

The Telelogic Synergy daemons must be running before a Telelogic Synergy session can be started. The `ccm_start_daemons` command starts all daemons on the same machine.

Note If you do not want to run all daemons on one machine, or if you want to run additional daemons on other machines, see the *Telelogic Synergy Administration Guide for UNIX*.

Also, you will need to start these daemons and the primary CCM server each time the server machine is rebooted. For your convenience, you should create boot scripts for this purpose, as described in the *Telelogic Synergy Administration Guide for UNIX*.

Note You must run CCM server on each machine supporting a web mode session.

1. Set user to `ccm_root`.

```
$ su - ccm_root
Password: *****
$ CCM_HOME=ccm_home; export CCM_HOME
$ PATH=$CCM_HOME/bin:$PATH; export PATH
```

2. Start the daemons.

```
$ ccm_start_daemons
```

If all the daemons do not start, use the `ccm_stop_daemons` command to stop all daemons before attempting to start them again.

3. Exit from user `ccm_root`.

```
$ exit
```

Note You must run the object registrar on your Informix database server if the database server and installation machines are not the same. Also, if the database server is not the same as the installation machine, you must run `ccm_install -l` on the engine hosts.

For more information, see the `ccm_objreg` command in the *Telelogic Synergy Administration Guide for UNIX*.

6

Post-Installation

This section explains how to verify correct installation by unpacking a test database into the directory and setting up for Telelogic Synergy databases (*ccmdb*) on the database server. If any of the steps in this section fail, contact Telelogic technical support as explained in “Contacting IBM Rational Software Support” on page 3.

The ability to perform web-based installations for Windows clients running on UNIX servers is also described. See “Download Windows client installations” on page 48.

Checklist

Use the following checklist, in the sequence shown, to verify your Telelogic Synergy installation:

- “Configure for remote processes (optional)” described below
- “Unpack a test database” described below
- “Start a Telelogic Synergy session” on page 47

Configure for remote processes (optional)

To use Telelogic Synergy Distributed (also referred to as DCM), you must set up hosts for distributed builds and DCM. For more information, see “Set Up for Remote Command Execution” in the *Telelogic Synergy Administration Guide for UNIX*.

Unpack a test database

Unpack a database from the installation directory, `$CCM_HOME/packfiles`.
For example, on the database server machine, unpack a base model database (`base.cpk`) to a new database, `/data/ccmdb/testdb`.

Note If you are not using the default server name, you must use the `-s servername` option on the `ccmdb unpack` command.

1. Log in as `ccm_root` and set the environment variables.

```
$ su - ccm_root
Password: *****
$ CCM_HOME=ccm_home; export CCM_HOME
$ PATH=$CCM_HOME/bin:$PATH; export PATH
```

2. Unpack the database.

```
$ ccmdb unpack $CCM_HOME/packfiles/base.cpk -t /data/ccmdb/
testdb
```

Note For more information about the `ccmdb unpack` command and database naming conventions, see the *Telelogic Synergy Administration Guide for UNIX*.

Start a Telelogic Synergy session

To verify that the server is online and that all Telelogic Synergy daemons are running, start a Telelogic Synergy session.

For example, to start a session on the `/data/ccmdb/testdb` database, do the following:

3. Start a web mode session.

```
$ cmsynergy& -d/data/ccmdb/testdb -s server_url
```

1. Start a traditional mode session.

```
$ cmsynergy& -d/data/ccmdb/testdb -h engine_host
```

Note If you are prompted to enter a password, you are starting a secure client session. You must enter your password to continue.

2. Monitor the Telelogic Synergy daemons.

```
$ ccm monitor -d /data/ccmdb/testdb
```

```
Telelogic Synergy process monitor...5 process(es) located:
user      process  host      port  pid  database path
-----
ccm_root  router   galaxy    1512  2954  -
ccm_root  objreg   galaxy    34820 2994  -
joe       monitor  pacifica  44351 13654  -
joe       gui      pacifica  1705  322  /vol/data/ccmdb/testdb
joe       engine   pacifica  40308 8386  /vol/data/ccmdb/testdb
```

If the daemons are running and the session starts, you have successfully completed the Telelogic Synergy installation.

3. Exit both session.

Download Windows client installations

You can now provide a web-based Windows client installation program for the Windows Client. You must provide a URL that identifies the Telelogic Synergy CCM Server, as this is where the installation is served. The URL has the format: `http://ccm_server_host:ccm_server_port/install.html`, where

`primary_ccm_server` is the hostname of the server where the server is installed, and

`primary_ccm_port` is the port number of the server.

These are items 13 and 14 in your installation worksheet.

The CM administrator must provide the URL to users who will be performing the Client installation via download.

Guidelines for the web-based installation process

In order for Windows users to successfully complete the installation process, users must provide the information requested. The CM administrator should send mail to all Windows users providing all the necessary information the users need to complete the installation. The user will see the client installation wizard, so the following information will be requested:

- Router host name
- Router port number
- Host name of the main Windows server
- UNIX server installation path

When the user starts any client on UNIX, the user may be notified that an update to the product is required. The client cannot continue, and the update must be installed manually, as the downloadable is not available on UNIX platforms. To start web mode sessions, you need to know the URL of the CCM server.

Appendix A: Informix setup and tuning

This appendix discusses two important Informix topics: setup and tuning.

- Setup is discussed in the section, “Prepare UNIX database servers” on page 49.
- Tuning is discussed in the section, “Informix tuning guidelines” on page 53.

Prepare UNIX database servers

Use this information to prepare UNIX database servers for Informix Dynamic Server.

Create Informix chunk files

Informix chunk files can be cooked files or raw partitions. For better performance and reliability on production databases, use raw disk partitions.

Only an experienced system administrator should create chunk files.

Caution Do not create chunk files on an NFS-mounted partition.

The default space suggested for the **root**, **temp**, and **log** dbspaces is about 1 MB per user; for the **ccm** dbspace it is about 2 MB per user. For the default 40 users, the total is about 200 MB. This is only a rough estimate for the initial database chunk. In general, you should allocate dbspace generously to allow for future growth.

Cooked files

No action is necessary on your part to use cooked files (i.e., set up a file system).

Use the estimates shown below to allocate disk space for cooked chunk files.

40 users (default) 200 MB

Raw partitions

This section summarizes how to set up a raw partition on a new, blank disk that has been formatted already. (New disks typically are formatted by their manufacturers.)

1. Partition the disk into the sizes of your choice.
2. Create a symbolic link to the raw device; i.e., make *chunk_name* a symbolic link to the raw device.

```
root# ln -s raw_device_path chunk_name
```

This step is optional, but you should use a symbolic link to the device for the following reasons.

If you will be archiving Informix servers using **ccmsrv archive**, and restoring the servers using **ccmsrv restore**, the restored Informix server configuration must be nearly identical to the archived server's configuration. This means that you must restore to the same chunk file path used to archive the server. Using a symbolic link for the chunk file path is a reliable way to ensure that the archive and restore paths are identical.

Using a symbolic link also facilitates changing the chunk file to a different (but at least same size) partition, or to a larger partition.

Additionally, using symbolic links means you won't have problems if the raw partition name changes, for example, if you upgrade the operating system.

3. Change the ownership, group, and permission of the raw partition path.

```
root# chown informix chunk_name
```

```
root# chgrp informix chunk_name
```

```
root# chmod 660 chunk_name
```

4. When **ccmsrv create** prompts for a raw partition name, type the path to the symbolic link for that partition.

Be sure to reference the correct partition.

```
chunk_name
```

5. Repeat steps 2-4 for `root`, `temp`, `log`, and `ccm`.

For more information about how to partition a raw disk, see the documentation for your operating system.

Check shared memory and semaphore kernel parameters

Telelogic requires that the shared memory and semaphore kernel parameters on the database server have at least the minimum values shown, and you might need to increase them if there will be more than 20 users per database server. The values shown are those used by Informix for testing the port to each platform.

Because the optimal values depend on your hardware, network configuration, software, and workload, ask your system administrator for assistance.

Note The `ipcs` command displays the current shared memory that is in use. This command can help you debug shared memory problems.

If you are adding many more users to a database or creating a new server, you might need to increase the shared memory and semaphore kernel parameter values.

Caution Before changing the kernel parameters, be sure to perform a complete backup of the system (e.g., save a copy of the kernel).

Solaris 10

On Solaris 10, all System V IPC facilities are either automatically configured or can be controlled by resource controls. The following kernel parameters are either removed or commented out from `/etc/system`:

```
semsys:seminfo_semmap
semsys:seminfo_semmns
semsys:seminfo_semmnu
semsys:seminfo_semume
shmsys:shminfo_shmmin
shmsys:shminfo_shmseg
```

The following obsolete IPC tunables are replaced by their resource controls with the new default values:

```
semsys:seminfo_semmni
semsys:seminfo_semmsl
shmsys:shminfo_shmmax
shmsys:shminfo_shmmni
```

Please refer to `rctladm(1m)` man page for more information about available resource controls.

RedHat Enterprise Linux 4.0

```
SHMMAX: 33554432
```

```

SHMMIN: 1
SHMMNI: 128
SHMSEG: 128
SHMALL: 4194304
SEMMNI: 128
SEMMSL: 250
SEMMNS: 32000
SEMOPM: 32
    
```

The value of the kernel parameter SEMMSL should be set to at least 100. This is the maximum number of semaphores per set.

Add machines and protocols to the sqlhosts files

To support both local and remote access to the database server, the `ccmsrv` create command creates the following two database server entries in the `$CCM_HOME/informix/etc/sqlhosts` file:

```

dbservername nettype hostname dbservername
dbservername_net nettype hostname servicename
    
```

The first type of entry is for a local connection (e.g., a local connection for an engine and a database server in the same machine). The second type of entry is for a remote (`_net`) connection through sockets using TCP/IP (e.g., for a network connection to an engine on a remote machine).

For example, `marathon` is connected as `marathon` using a shared memory protocol (`onipcshm`), and as `marathon_net` using a Solaris TCP protocol (`ontlitcp`):

```

marathon onipcshm marathon marathon
marathon_net onlitcp marathon marathon_marathon
    
```

The fourth column contains the database server name for local connections, and the service name (as defined in the `services` file) for network connections.

The following table shows the protocols (*nettypes*) for the supported Telelogic Synergy platforms.

Platform	Local	Remote (Sockets)
Solaris	onipcshm	ontlitcp
AIX	onipcshm	onsoctcp
Linux	onipcshm	onsoctcp

For AIX and Linux, heterogeneous UNIX installations should share a single copy of the `$CCM_HOME/informix/etc` directory, and therefore a single copy of the `$CCM_HOME/informix/etc/sqlhosts` file. This means that entries added to `sqlhosts` by `ccmsrv create` are visible to all UNIX platforms.

If you did not link the `$CCM_HOME/informix/etc` directories, after creating a server on one platform you must copy the entries from the `sqlhosts` file for that platform to the `sqlhosts` files for your other platforms.

In the case of Solaris, the network protocol supported by Informix is different from the AIX or Linux platforms: the `sqlhosts` file for Solaris must be different, and you must add entries manually to the `sqlhosts` files after creating a server if you want that server to be accessible from other platforms.

If you want to access this server from a Solaris platform, which cannot share the `sqlhosts` file, you must add an entry such as the following to the Solaris `sqlhosts` file:

```
mobysrv_net      ontlitcp      moby      mobysrv_moby
```

Similarly, after creating a server on a Solaris machine **stellar**, you would have two entries such as the following in the Solaris `sqlhosts` file:

```
stellarsrv      onipcshm      stellar      stellarsrv
stellarsrv_net  ontlitcp      stellar      stellarsrv_stellar
```

To access the `stellarsrv` server from AIX or Linux systems, you must copy the following line to the `sqlhosts` file on each of those other platforms:

```
stellarsrv_net  onsocketcp    stellar      stellarsrv_stellar
```

Informix tuning guidelines

This section describes proper configuration and maintenance for the Informix database.

Partitions

For best results:

- Always use raw partitions instead of cooked partitions.
- Create four (4) raw partitions on separate physical disk drives for optimal performance from your UNIX server.
- Place each chunk file (**ccm**, **log**, **rootdbs**, **tempdbs**) on a separate drive.

Dedicated Informix server

For better performance, dedicate your Synergy database server machine to run Telelogic Synergy. If you have a dedicated Synergy database server machine, make the following change to the RESIDENT parameter in the Informix ONCONFIG file:

```
RESIDENT = 1
```

The default setting is 0. This parameter specifies whether shared memory remains in operating-system physical memory. If the default setting remains, shared memory will be swapped to disk, which might slow Synergy server performance for large sites and at various usage times.

For more information on the Informix ONCONFIG file, see the appropriate Informix administrator's document.

Appendix B: Alternative Installations

If required, you can set up alternative installations as described in the following sections:

- “Create multiple installations of Telelogic Synergy” described below
- “Run Telelogic Synergy processes across a network” on page 60
- “Install onto a remote file system” on page 59
- “Install onto a machine running Informix” on page 60
- “Set up a UNIX client” on page 62
- “ESD authentication through PAM” on page 65

Create multiple installations of Telelogic Synergy

Telelogic Synergy supports multiple simultaneous installations of the Telelogic Synergy software. Multiple installations let you use more than one release of Telelogic Synergy on the same platform, or run binary-incompatible versions on a network of Telelogic Synergy-supported machines. For example, you might have a network with both Linux and Solaris machines.

If you are installing onto a heterogeneous network, perform the following consistency checks:

- Ensure that user IDs are consistent throughout the network (with or without NIS).
- Verify that group IDs are consistent throughout the network (with or without NIS).
- Ensure that host names are consistent throughout the network.

Choose a machine for the primary installation. (Installations for all other platforms are considered secondary installations.) The *file server* machine is where the installed Telelogic Synergy files physically reside. To avoid problems writing these files to the installation directory as *root*, use the same machine for the primary installation machine and the file server, and perform the installation on that machine. Symbolically link `/usr/local/ccm` to the installation directory. This makes it easy to upgrade to a new release by re-linking `ccm`.

In the examples used in this appendix, note the following:

1. A Solaris platform is the primary installation machine.
2. The primary machine is the file server for all (primary and secondary) installations.
3. The machines are assumed to have NFS access to each other.

Note The installation requires that *root* be able to write to the installation directory. If you are installing onto a remote file system, see “Install onto a remote file system” on page 59.

Install onto the primary machine

You must first install onto the primary machine because its installed binaries are used to execute the `ccm_install` command when you create installation areas on other machines.

Follow the steps in “Load the software” on page 34 to set up the primary installation. Be sure that the `CCM_HOME` directory points to a symbolic link and that the symbolic link (or mount point and its contents) is accessible throughout the network.

You can set up the primary installation much like a normal Telelogic Synergy installation. However, you may want to choose an installation directory that is named according to the platform.

For example, on a Solaris platform, enter the following commands to use the `/vol/sun/ccm70` directory for the primary installation.

```
root@sol# mkdir /vol/sun/ccm70
root@sol# cd /usr/local
root@sol# ln -s /vol/sun/ccm70 ccm70
root@sol# CCM_HOME=/usr/local/ccm70; export CCM_HOME
root@sol# PATH=$CCM_HOME/bin:$PATH; export PATH
root@sol# cd ccm70
root@sol# /media/ccm/unix/bin/ccm_install -x
```

media is item 6 of the worksheet on page 10.

Install multiple releases onto the primary machine

You can install multiple releases onto the primary machine using the same procedure for installing on the primary machine for the first time. Select a different installation directory (*ccm_home*), and different port numbers for the router, ESD, CCM server, and Informix database server.

Follow the installation instructions (see “Load the software” on page 34) for each new Telelogic Synergy installation directory. The new installation will then have its own `$CCM_HOME` directory.

For example, suppose the primary installation is `ccm70` on a Solaris platform and you want to install a test release onto `/vol/sun/ccmtest` on the same platform. The commands are as follows:

```
root@sol# mkdir /vol/sun/ccmtest
root@sol# cd /usr/local
root@sol# ln -s /vol/sun/ccmtest ccmtest
root@sol# CCM_HOME=/usr/local/ccmtest; export CCM_HOME
root@sol# PATH=$CCM_HOME/bin:$PATH; export PATH
root@sol# cd ccmtest
root@sol# /media/ccm/unix/bin/ccm_install -x
```

media is item 6 of the worksheet on page 10.

Users can then set `CCM_HOME` to `/usr/local/ccm70` for the primary installation, or set `CCM_HOME` to `/usr/local/ccmtest` for the test installation.

For example, to run using the primary installation, set user to `ccm_root` and execute the following commands:

```
$ su - ccm_root
Password: *****
$ CCM_HOME=/usr/local/ccm70; export CCM_HOME
$ PATH=$CCM_HOME/bin:$PATH; export PATH
```

To run using the secondary installation, set user to `ccm_root` and execute the following commands:

```
$ su - ccm_root
Password: *****
$ CCM_HOME=/usr/local/ccmtest; export CCM_HOME
$ PATH=$CCM_HOME/bin:$PATH; export PATH
```

Install binary-incompatible versions onto the primary machine

You can install a binary-incompatible version onto the primary machine using the same procedure for installing on the primary machine for the first time, but specifying the new platform's type.

Follow the installation instructions (see "Load the software" on page 34) for each new Telelogic Synergy installation directory. Select a different installation directory (*ccm_home*), but use the **same** port numbers for the router, ESD, CCM server, and Informix database server as you used for the primary installation.

For example, suppose the primary installation is `ccm70` on a Solaris file server and you want to install a Linux version onto `/vol/linux/ccm70` on the same machine. The steps are as follows:

1. Create the secondary, binary-incompatible installation.

```
root@sol# mkdir /vol/linux/ccm70
root@sol# CCM_HOME=/usr/local/ccm70; export CCM_HOME
root@sol# PATH=$CCM_HOME/bin:$PATH; export PATH
root@sol# cd /vol/linux/ccm70
root@sol# /media/ccm/unix/bin/ccm_install -x -d /vol/linux/ccm70
-p linux
```

media is item 6 of the worksheet on page 10.

`CCM_HOME` and `PATH` must point to the installation executables on the local machine, **not** to the destination directory for the new Linux installation. The Linux installation's destination is specified using the `-d` option, and the new installation's type is specified using the `-p` option.

Note When you perform a secondary installation, you receive a message about library links. This message reminds you to log on to the secondary platform and run the `ccm_install -l` command after you successfully execute the `ccm_install -x` command on the primary platform.

2. Set up mounts and links so that users access the correct installation for their platforms.

Set up all machines of the **same platform** so that the `cd /usr/local/ccm70` command will take users to the appropriate directory (for example, `/vol/sun/ccm70` or `/vol/linux/ccm70`).

3. Share the primary installation configuration files among all platforms.

Create a symbolic link for Telelogic Synergy configuration files from the secondary installation to the primary platform.

```
root@sol# cd /vol/linux/ccm70
root@sol# mv etc etc_linux
root@sol# ln -s /vol/sun/ccm70/etc etc
```

4. Set up the secondary machine.

- a. Log on to the secondary machine (for example, Linux) as *root*.

- b. Set up the environment.

```
# CCM_HOME=/usr/local/ccm70; export CCM_HOME
# PATH=$CCM_HOME/bin:$PATH; export PATH
# ccm_install -l
```

- c. If necessary, create a database server, set up engines hosts, and start daemons. For more information, see “Run Telelogic Synergy processes across a network” on page 60.

Note If you have trouble starting Telelogic Synergy after a heterogeneous installation, check that the path of `local.ccm.home` is correct in the `$CCM_HOME/etc/ccm.server.properties` file. It may need to be reset to point to the correct directory structure, as it may be using an incorrect path.

Install onto a remote file system

To install onto a remote file system, you need to be logged on as user *root* and be able to write to the installation directory. If *root* access is **not** allowed, then either run the `ccm_install` program on the NFS server, or temporarily allow *root* access across NFS.

Run Telelogic Synergy processes across a network

To run Telelogic Synergy processes across network installations, all machines share one set of Telelogic Synergy daemons. However, you might want to run your daemons on different machines, and these machines need not be the same platform. For example, you could manage your databases using a Sun server, but run the Telelogic Synergy software on a Linux workstation.

The following sections describe where you can run Telelogic Synergy daemons when you have multiple installations.

Telelogic Synergy daemon processes

- Router
You must run one router process for the network Telelogic Synergy installation. You can run this process on any machine where Telelogic Synergy is installed. You must choose this machine during the primary installation.
- Object Registrar
You can run multiple object registrars per CCM_HOME location. The object registrar typically runs on each machine that has an Informix server.
- Engine Startup Daemon
You must run one ESD process on any machine where you will run Telelogic Synergy engines with secure connections.
- Telelogic Synergy primary Server
You must run one primary server for the network Telelogic Synergy installation. By default, the primary server runs on the same machine as the router.

Telelogic Synergy databases

You can create Telelogic Synergy databases on any database server.

Install onto a machine running Informix

When you install Telelogic Synergy on a machine running Informix (regardless of the software versions it supports, and whether Informix is running for earlier releases of Telelogic Synergy or for third-party software), you must use the following guidelines to avoid potential problems:

- When running Telelogic Synergy, ensure that no one, including regular users such as user *joe*, user *mike*, and so on) and administrative users (that is, users *ccm_root*, *informix*, and *root*), sets the ONCONFIG, INFORMIXDIR, and INFORMIXSERVER environment variables. Setting these variables can cause commands to be run on the wrong servers.
- User *informix* and group *informix* can be shared among multiple installations of Informix; you need not change any user or group settings.
- Ensure that each server name, on a given machine, is unique.

Note If the Telelogic Synergy Informix server does not use the default server name, you must use the `-s` option and appropriate *servername* whenever you use the `ccmsrv` and `ccmdb` commands.

- Verify that the SERVERNUM configuration parameter is unique among all Informix database servers on the same machine. SERVERNUM must be unique on the machine. Otherwise, the servers will interfere with each other.
- Ensure that the SERVERNUM configuration parameter for all existing Informix database servers has a value from 1 to 255, inclusive. (The valid numbers are from 0 to 255; 0 is the default. However, you should only use values from 1 to 255 because 0 does not allow multiple servers to co-exist.)

Perform the following steps to check the server number for a database server:

1. Set user to *informix*.

```
$ su - informix
```

2. Set the environment variables.

```
$ CCM_HOME=ccm_home; export CCM_HOME  
$ PATH=$CCM_HOME/bin:$PATH; export PATH
```

3. Edit a file that resides under the `$INFORMIXDIR/etc` subdirectory (for Telelogic Synergy, this subdirectory is `$CCM_HOME/informix/etc`).

The file name is the same as the server name in Telelogic Synergy, but might be different if it was not created by Telelogic Synergy. A typical name is `onconfig`. Search this file for `SERVERNUM` to see its value.

Set up a UNIX client

You can install Telelogic Synergy onto a UNIX client regardless of whether NFS is used. The following paragraphs explain what you need to do to set up each of these installations.

On UNIX, you need only one installation of Telelogic Synergy. However, all UNIX clients must be able to access the installation directory.

Set up a UNIX client that uses NFS

To set up a client that uses NFS, do the following:

1. If you have multiple installations, or if you do not have any installation below or linked from `/usr/local/ccm`, set `CCM_HOME` and `PATH`. Otherwise, skip this step.

```
$ CCM_HOME=ccm_home
$ PATH=$CCM_HOME/bin:$PATH
$ export CCM_HOME PATH
```

`ccm_home` is the directory into which Telelogic Synergy is installed.

2. Be sure that the following requirements are met:

- For traditional mode sessions, you must enable either `rsh` or `ESD` on the server to allow remote UNIX clients.

If `ESD` is not in use, engine hosts must trust the users and machines. To enable this, configure your `.rhosts` or `hosts.equiv` file accordingly. (Both files are discussed in the *Telelogic Synergy Administration Guide*.)

- For traditional mode sessions, you must enable either `rexec` or `ESD` on the server for Windows clients.
- The database server must trust `ccm_root` on the engine machines.

To enable this, configure `ccm_root's` `.rhosts` or `hosts.equiv` file accordingly. (Both files are discussed in the *Telelogic Synergy Administration Guide*.)

- The client must be able to resolve the name or IP address of the server.
- On the client, the `ccm_root` user ID (UID) and group ID (GID) must match the server.
- The router service must be listed in the `/etc/services` directory on the client.

For more information, contact your system administrator.

- `$CCM_HOME` must be the same on the client and server.

Do this by mounting the server's installation so it appears on the client in the same path.

- The `$CCM_HOME/etc/.router.adr` file must point to the correct location. Typically, the router is running on the server.

3. Start a Telelogic Synergy session.

```
$ ccm start -d ccmdb
```

`ccmdb` is the path to the Telelogic Synergy database.

Set up a UNIX client that does not use NFS

To set up a client that does not use NFS, do the following:

1. If you have multiple installations, or if you do not have any installation below, or linked from, `/usr/local/ccm`, set `CCM_HOME` and `PATH`. Otherwise, skip this step.

```
$ CCM_HOME=ccm_home
$ PATH=$CCM_HOME/bin:$PATH
$ export CCM_HOME PATH
```

`ccm_home` is the directory into which Telelogic Synergy is installed.

2. Be sure that the following requirements are met:

- For traditional mode sessions, you must enable either `rsh` or `ESD` on the server to allow remote UNIX clients.

If `ESD` is not in use, engine hosts must trust the users and machines. To enable this, configure your `.rhosts` or `hosts.equiv` file accordingly. (Both files are discussed in the *Telelogic Synergy Administration Guide*.)

- For traditional mode sessions, you must enable either `rexec` or `ESD` on the server for Windows clients.
- The database server must trust `ccm_root` on the engine machines, regardless of whether `ESD` is in use.

To enable this, configure `ccm_root's` `.rhosts` or `hosts.equiv` file accordingly. (Both files are discussed in the *Telelogic Synergy Administration Guide*.)

- The client must be able to resolve the name or IP address of the server.
- On the client, the `ccm_root` user id (UID) and group id (GID) must match the server.
- `$CCM_HOME` must be the same on the client and server.

Do this by creating a copy of the server's installation so it will appear on the client in the same path.

- The `$CCM_HOME/etc/.router.adr` file on the client must point to the correct host and port on the server.
3. Load the software by performing steps 1 through 3 in “Load the software” on page 34.
 4. Start a Telelogic Synergy session.

- Enter the following for a web mode session:

```
$ cmsynergy& -h engine_host_name -d ccldb
```

Note Web mode sessions only support copy-based work areas.

- Enter the following for a traditional mode session:

```
$ cmsynergy& -s server_url -d ccldb
```

To set Telelogic Synergy to start in copy-based mode, you must change an entry either in the `$CCM_HOME/etc/ccm.properties` file or the `$HOME/.ccm.user.properties` file.

Enter the following setting in the file:

```
user.allow.link.based.workareas=false
```

Setting this value to anything other than `false` will cause Synergy to start in link-based mode. The value is case-insensitive.

- Or, to start a Telelogic Synergy Classic session:

```
$ ccm start -h engine_host_name -rc -d ccldb
```

`ccldb` is the path to the Telelogic Synergy database.

Users on distributed UNIX installations not using NFS must start sessions using the `ccm start -rc` remote client option. This ensures that necessary libraries located under the database path are visible to the UI process.

ESD authentication through PAM

On Solaris and LINUX[®] systems, the engine startup daemon (ESD) will use PAM to authenticate users. The PAM service name is “cmsynergy”. To allow the ESD to authenticate users, the PAM configuration must be updated to specify the authentication methods to use for the “cmsynergy.” service unless a reasonable default already exists.

example additions to Solaris `/etc/pam.conf` file:

```
cmsynergy auth required /usr/lib/security/$ISA/pam_unix.so.1
cmsynergy account required /usr/lib/security/$ISA/pam_unix.so.1
```

example `/etc/pam.d/cmsynergy` file for LINUX:

```
auth required /lib/security/pam_stack.so service=system-auth
auth required /lib/security/pam_nologin.so
account required /lib/security/pam_stack.so service=system-auth
```

For additional information about how to configure PAM, please refer to your system’s documentation.

Set up the esd client

You must tell the client to connect to `esd` rather than use the normal engine startup procedure. This is done by editing the `ccm.ini` file in the Synergy client installation’s `etc` directory to specify how the engine is started. You must add the following line to the first section of the `ccm.ini` file:

```
engine_daemon = TRUE
```

You should change the `$CCM_HOME/etc/ccm.ini` file, not your own `ccm.ini` file.

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Index

Symbols

/etc/group file, 23
/etc/hosts.allow file, 41
/etc/hosts.equiv file, 24
/etc/passwd file, 23
/etc/services file, 28

A

adding protocols to sqlhosts, 52

B

before installing, 15

C

caution, defined, 6
ccm_home variable, 19
ccm_install program, running, 34
ccm_root user, creating, 25
ccmdb variable, 19
chunk files
 disk space considerations, 38
 more about creating, 49
 moving to other location, 38
client
 installation, 62
 machine requirements, 18
completing the installation, 36
configuring for remote execution, 45
cooked files, 49
creating
 an installation directory, 27
 the databases directory, 38
 the INFORMIX database server, 37
creating chunk files, 49

D

daemons
 inetd, 30
 on a heterogeneous network, 60
 starting, 43
database servers
 creating, 37
 machine requirements, 17
databases
 creating the parent directory, 38
 unpacking, 46
 where to create, 60
DCM
 defined, 45
 remote host file (om_hosts.cfg), 24
disk space
 and chunk files, 38
 requirements, 21
distributed build file (om_hosts.cfg), 24
documentation
 available, 6
documentation for Telelogic Synergy, 6
downloading install image, 33
drive, identifying, 29

E

engine server, defined, 7
engine startup daemon, 7, 11, 30, 35, 41, 60
environment variables
 INFORMIXDIR, 61
 INFORMIXSERVER, 61
 ONCONFIG, 61
 SERVERNUM, 61
environment, setting up, 36
error messages
 out of shared memory, 40
 shared memory already exists, 40
ESD, 7, 11, 30, 35, 41, 60
ESD, defined, 7
esd, updating configuration, 65

exit from a session, 47

F

files

- /etc/group, 23
- /etc/hosts.allow, 41
- /etc/hosts.equiv, 24
- /etc/passwd, 23
- /etc/services, 28
- group, 23
- hosts.equiv, 24
- om_hosts.cfg, 24
- passwd, 23
- services, 23
- sqlhosts, 24

G

getting started, 15
group file, 23

H

heterogeneous network, daemon sharing,
60
host IDs, for multiple installations, 55
hosts.equiv file, 24

I

IBM Customer Support, 3
inetd daemon, 30
INFORMIX information, 49
INFORMIX tuning guidelines, 53
informix user, creating, 25
informix_chunkfiles variable, 19
INFORMIXDIR, 61
INFORMIXSERVER, 61

installation

- client, 62
- completing, 36
- directory requirements, 19
- INFORMIX information, 49
- multiple, 55
- preparing for, 15
- setting up for alternative, 31

installation machine

- defined, 8

installation machine requirements, 16

installing

- from download, 33
- on a machine already running
INFORMIX, 60
- on a remote file system, 59
- on different machines, 38
- onto a client, 62

K

kernel parameters

- checking before installation, 30

kernel parameters, setting, 51

L

library link message, 58
license manager, defined, 8
loading the software, 33, 34

M

media drive, identifying, 29
modes

- traditional, 8, 47
- Web, 8
- web, 47

multiple installations, 55

- object registrar, 60
- router process, 60

N

note, defined, 6

O

object registrar
 in multiple installations, 60
 where to run, 60
object registrar, defined, 8
om_hosts.cfg file, 24
ONCONFIG, 61

P

PAM, updating configuration for ESD, 65
passwd file, 23
planning for the installation, 15
preparing the database server, 30
protocols, adding to sqlhosts, 52

R

raw partitions, 49
readme, 1
release notes, 1
remote processes, configuring for, 45
requirements
 client machine, 18
 database server machine, 17
 disk space, 21
 for routing, 23
 installation directories, 19
 installation machine, 16
requirements files
 hosts, 23
 om_hosts.cfg, 23
 passwords, 23
 services, 23
rexec, 30
root user, access during remote installs, 59
router process
 in multiple installations, 60
 where to run, 60
router service, setting up, 28
router, defined, 8
run area (\$CCM_HOME), 5

S

server number, 39, 40, 61
server_num, defined, 14
SERVERNUM, 61
services file, 23
session types
 traditional mode, 47
 web mode, 47
setting kernel parameters, 51
setting up
 for remote engine hosts, 40
 the ccm_root user and group, 25
 the router service, 28
 the Telelogic Synergy environment, 36
setting up a client
 that does not use NFS, 63
 that uses NFS, 62
shared memory error message
 out of shared memory, 40
 shared memory already exists, 40
shells, 4
SHMSEG error message, 40
sqlhosts file, 24
 add protocols, 52
 server entries created in, 37
starting
 a Telelogic Synergy session, 47
 daemons, 43
symbols used in document, 5

T

technical support, 3
Telelogic Synergy
 documentation, 6
terms and concepts, 7
traditional mode, 8, 47
tsort command, 17, 36

U

unpacking a database, 46

upgrading
 from a previous release, 1
user ccm_root, creating, 25
user informix, creating, 25

V

VPN IP address, adding, 41

W

Web mode, 8
web mode, 47
web site, installing from, 33
Windows clients, access to UNIX database
 server, 30
work area, defined, 8

X

X applications, setting up, 36