**Rational.** Synergy

IBM

Installation Guide for Oracle

*IBM Rational Synergy*

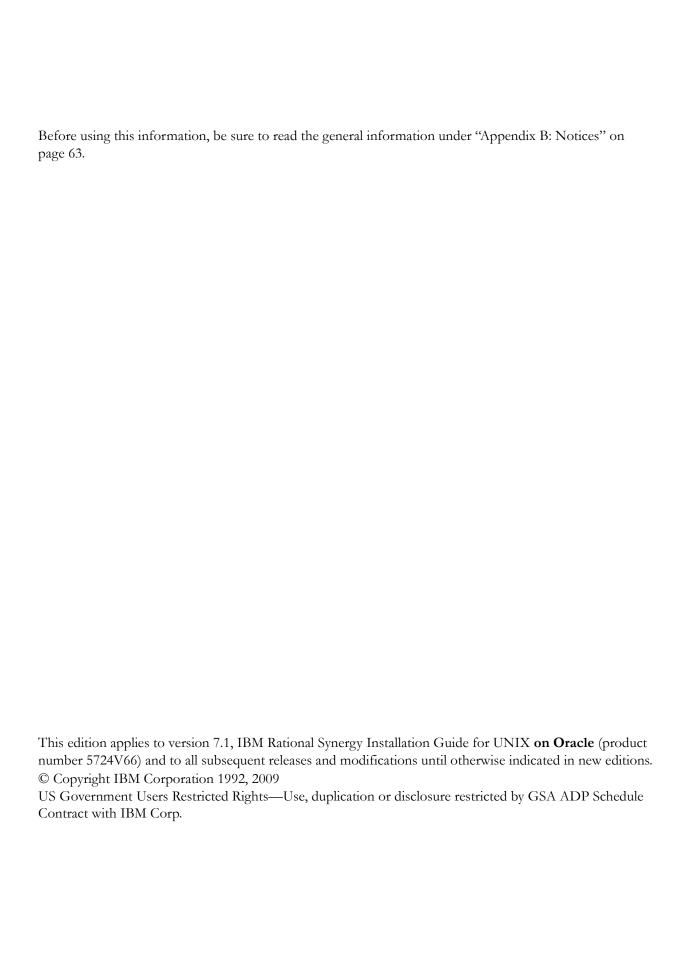*Installation Guide for UNIX on Oracle*

*Release 7.1*

Before using this information, be sure to read the general information under "Appendix B: Notices" on page 63.

# *Table of Contents*

## Chapter 5: Installation           37

## Chapter 6: Post-installation           45

# Appendix A: Alternative installations                                               51

# Appendix B: Notices                                                                 63

# Index                                                                               67

# *1*          *Introduction*

This chapter explains what you must know before installing IBM® Rational® Synergy on UNIX® running on Oracle®.

The following information is available:

- "Readme" on page 1
- "Upgrading 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
- "Conventions used in this guide" on page 6
- "Rational Synergy documentation" on page 8

## Readme

The IBM Rational Synergy Readme file contains vital information about your Rational 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 Rational Synergy Readme file is available on the Rational Software Information Center site at `http://publib.boulder.ibm.com/infocenter/rsdp/v1r0m0/index.jsp`. For more information about obtaining documents, see "Rational Synergy documentation" on page 8.

> **Note** The Rational Synergy Readme file is revised and reissued, as needed, to provide the most current information. To ensure you have the latest version, download an electronic copy from the Rational Software Information Center.

## Upgrading from a previous release

You can upgrade existing Rational Synergy servers and databases to the current release of Rational Synergy. The upgrade process is described in the *IBM Rational Synergy Upgrade Instructions for UNIX*. These instructions are available on the Rational Software Information Center site (`http://publib.boulder.ibm.com/infocenter/rsdp/v1r0m0/index.jsp`).

# Release summary

For a synopsis of the new features of Rational Synergy release 7.1, see the Rational Synergy Readme file (`http://publib.boulder.ibm.com/infocenter/rsdp/v1r0m0/index.jsp`.).

## *Interfaces installed by Rational Synergy 7.1*

Rational Synergy for UNIX offers the following graphical user interfaces.

- **Rational Synergy**

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

- **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:

- To start Rational Synergy, the client, engine, and database must all be from the same release and service pack; you cannot mix components from different Rational Synergy releases or service packs.

- To start Rational Synergy, you must install and run the Rational License server.

- To run Rational Synergy, you must install the IBM® Rational® Directory Server.

- Windows clients may be used with both UNIX and Windows servers.

- UNIX clients and servers can share a single installation if the install directory is accessible across the network.

Rational Synergy 7.1 is compatible with IBM® Rational® Change 5.1 or later. If you are already using Rational Change, you must upgrade to Rational Change 5.1 or later at the same time as you upgrade to Rational Synergy 7.1.

## User prerequisites

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

In addition, you must have:

- *root* access on each machine where Rational Synergy will be installed, and database server and engine server machines.

- knowledge of your company's hardware infrastructure and network topology.

- Knowledge of your Oracle installation.

- a working knowledge of how your company will use Rational Synergy. For example, will you want to configure your installations for remote builds?

## Contacting IBM Rational Software Support

If the self-help resources have not provided a resolution to your problem, you can contact IBM® Rational® Software Support for assistance in resolving product issues.

> **Note** If you are a heritage Telelogic customer, a single reference site
> for all support resources is located at http://www.ibm.com/
> software/rational/support/telelogic/

## Prerequisites

To submit your problem to IBM Rational Software Support, you must have an
active Passport Advantage® software maintenance agreement. Passport
Advantage is the IBM comprehensive software licensing and software
maintenance (product upgrades and technical support) offering. You can enroll
online in Passport Advantage from http://www.ibm.com/software/lotus/
passportadvantage/howtoenroll.html

• To learn more about Passport Advantage, visit the Passport Advantage FAQs
  at http://www.ibm.com/software/lotus/passportadvantage/
  brochures_faqs_quickguides.html.

• For further assistance, contact your IBM representative.

To submit your problem online (from the IBM Web site) to IBM Rational
Software Support, you must additionally:

• Be a registered user on the IBM Rational Software Support Web site. For
  details about registering, go to http://www.ibm.com/software/support/.

• Be listed as an authorized caller in the service request tool.

## Submitting problems

To submit your problem to IBM Rational Software Support:

1. Determine the business impact of your problem. When you report a
   problem to IBM, you are asked to supply a severity level. Therefore, you
   need to understand and assess the business impact of the problem that you
   are reporting.

   Use the following table to determine the severity level.

| Severity | Description |
|----------|-------------|
| 1 | The problem has a *critical* business impact: You are unable to use the program, resulting in a critical impact on operations. This condition requires an immediate solution. |
| 2 | This problem has a *significant* business impact: The program is usable, but it is severely limited. |

| Severity | Description |
|:---:|---|
| 3 | The problem has *some* business impact: The program is usable, but less significant features (not critical to operations) are unavailable. |
| 4 | The problem has *minimal* business impact: The problem causes little impact on operations or a reasonable circumvention to the problem was implemented. |

2.  Describe your problem and gather background information, When describing a problem to IBM, be as specific as possible. Include all relevant background information so that IBM Rational Software Support specialists 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?

        To determine the exact product name and version, use the option applicable to you:

        - Start the IBM Installation Manager and select **File** > **View Installed Packages**. Expand a package group and select a package to see the package name and version number.

        - Start your product, and click **Help** > **About** to see the offering name and version number.

    •   What is your operating system and version number (including any service packs or patches)?

    •   Do you have logs, traces, and messages that are related to the problem symptoms?

    •   Can you recreate the problem? If so, what steps do you perform to recreate the problem?

    •   Did you make any changes to the system? For example, did you make changes to the hardware, operating system, networking software, or other system components?

    •   Are you currently using a workaround for the problem? If so, be prepared to describe the workaround when you report the problem.

3.  Submit your problem to IBM Rational Software Support. You can submit your problem to IBM Rational Software Support in the following ways:

    •   **Online**: Go to the IBM Rational Software Support Web site at https:// www.ibm.com/software/rational/support/ and in the Rational support

task navigator, click **Open Service Request.** Select the electronic problem reporting tool, and open a Problem Management Record (PMR), describing the problem accurately in your own words.

For more information about opening a service request, go to http:// www.ibm.com/software/support/help.html

You can also open an online service request using the IBM Support Assistant. For more information, go to http://www.ibm.com/software/ support/isa/faq.html.

- **By phone**: For the phone number to call in your country or region, go to the IBM directory of worldwide contacts at http://www.ibm.com/ planetwide/ and click the name of your country or geographic region.
- **Through your IBM Representative**: If you cannot access IBM Rational Software Support online or by phone, contact your IBM Representative. If necessary, your IBM Representative can open a service request for you. You can find complete contact information for each country at http://www.ibm.com/planetwide/.

### Other information

For Rational software product news, events, and other information, visit the IBM Rational Software Web site (http://www.ibm.com/software/rational/).

## 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/ccm71 to the path using the sh shell as follows:

```
$ PATH=/usr/local/ccm71/bin:$PATH; export PATH
```

Add /usr/local/ccm71 to the path using the csh shell as follows:

```
% setenv PATH /usr/local/ccm71/bin:$PATH
```

### Command line interface

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

**Prompt**

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

**Options delimiter**

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

**Location of $CCM_HOME**

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

## *Default text editor*

> The default Rational Synergy UNIX text editor is vi. You can change the default text editor as described in "Default Settings" in the Rational Synergy CLI help. For more information about online help, visit the Rational Software Information Center site at `http://publib.boulder.ibm.com/infocenter/rsdp/v1r0m0/index.jsp`.

## *Fonts and symbols*

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

| Typeface | Description |
|---|---|
| *Italic* | Used for book titles and terminology. Also designates names of roles (*developer*), states (*working*), groups (*ccm_root*), and users (*john*). |
| **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 (`modify_time`), commands (`ccm start`), functions (`remote_type`), and types (`csrc`). |
| *Courier Italic* | Represents values in a command string that you supply. For example, (*database_path/username/commands*) |

> 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.

# Rational Synergy documentation

Unless otherwise noted, Rational Synergy documents are available on the
Rational Software Information Center site (`http://
publib.boulder.ibm.com/infocenter/rsdp/v1r0m0/index.jsp`),
and in the Documentation shipped with Rational Synergy.

# *2*                                           *Terms and concepts*

To perform the operations described in this guide, it is helpful to understand the following terms and concepts.

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

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

**Rational Synergy database server**
The *database server* hosts the Rational Synergy databases.

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

**engine server**
An *engine server* hosts the engine processes that communicate between the Rational Synergy client and the Rational Synergy Oracle database.

**ESD**
The *ESD* (Engine Startup Daemon) is an optional secure method for starting a user's Rational 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 *installation machine* hosts the Rational Synergy executables.

**object registrar**   The *object registrar* "registers" all changes made to Rational 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 *router* manages the communications among Synergy processes. You must run one router per network installation.

**Rational license server**
**TL**   The *license server* validates users' access to Rational Synergy databases. FLEXnet is used to manage licenses. You must run one license manager per network installation, and only on the machine for which Rational issued the license**.**

**Rational Directory**
**Server**   Rational Directory Server is a single enterprise directory solution designed for user authentication and administration for IBM® Rational® Solutions for Enterprise Lifecycle Management tools. The Rational Directory Server allows the users to log on using the same credentials across tools for which they have authorized access.

**Traditional mode**   Standard network communication for users who need administration. Traditional mode behaves as it did in Synergy 6.5.

**Web mode**   Web mode Rational Synergy clients communicate to a Web-based Rational 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. 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*    *Rational Synergy installation worksheet*

## Preparing for the installation

Use the following worksheet to organize the information you need to install Rational 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. **Rational Synergy installation machine** (`ccm_install_server`)

   This is the machine onto which the Rational Synergy executables will be installed. For more information, see "Installation machine requirements" on page 20 and "Preparing the Rational Synergy installation machine" on page 26.

   Default:   None
   Actual: _____

2. **Rational Synergy database server** (`ccmdb_server`)

   This is the machine on which the Rational Synergy databases will reside. For more information, see "Database server and engine machine requirements" on page 21. This machine might be the same as the installation machine (`ccm_install_server`, item 1). Also see "Starting a Rational Synergy session" on page 47 for information on daemons.

   Default:   None
   Actual: _____

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

   This is the *ccm_root* home directory path on the installation machine. For more information, see "Setting up ccm_root  and group" on page 26.

   Use Default:   None
   Use Path: _____

4. **Rational Synergy installation directory or** $CCM\_HOME (*ccm\_home*)

   This is the directory into which Rational Synergy will be installed. For more information, see "ccm_home" on page 23, and step 4 on page 38. This should **not** be the same as or under the *ccm\_root* home directory (*ccm\_root\_home*, item 3). For information on using a release-specific directory, see "Creating an installation directory" on page 27.

   Default Path:   None
   Actual: _____

5. **Media device name** (*dvd*)

   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 "Identifying the media drive" on page 29, and step 2 on page 38.

   Default Path:   None
   Actual: _____

6. **Database path** (*ccmdb*)

   This is the path to the Rational Synergy database. For more information, see , and "Creating an Oracle database" on page 41. This should **not** be the same as or under either the *ccm\_root* home directory (*ccm\_root\_home*, item 3) or ccm_home, item 4.

   Default Path:   None
   Actual: _____

7. **Router service host name** (*router\_host*)

   This is the name used for the Rational Synergy router host. Install Rational Synergy on this machine first. For more information, see "Setting up the router service" on page 28, and the end of "Setting up the Rational Synergy environment" on page 40.

   Default:   *system name*
   Actual: _____

8. **Router service name** (`router_service`)

   This is the name used for the Rational Synergy router service. For more information, see "Setting up the router service" on page 28.

   Default:  `ccm7.1_router`
   Actual: _____

9. **Router service port number** (`router_port`)

   This is the router port used for the `router_service`. For more information, see "Setting up the router service" on page 28.

   Default:  `5412` (reserved)
   Actual: _____

10. **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: _____

11. **Rational 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 7 in this worksheet).

    Default:  `system name`
    Actual: _____

12. **Rational Synergy primary ccm server port number**
    (`primary_server_port`)

    This is the port used for the default server and for accessing the Web-based product help. It is also the default port used for CCM servers on other machines. The ccm 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: _____

13.  **Rational 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 *IBM Rational License Server TL Licensing Guide.*

     Default:   None
     Actual: _____

14.  **Rational 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 *IBM Rational License Server TL Licensing Guide.*

     Default:   None
     Actual: _____

15.  **Rational Directory Server host** (*directory_server_host*)

     This is the name of the host where the Rational Directory Server is installed.

     Default:   None
     Actual: _____

16.  **Rational Directory Server port number** (*directory_server_port*)

     This is the port number used by the Rational Directory Server.

     Default:   None
     Actual: _____

17.  **Oracle installation directory** (ORACLE_HOME)

     This is the directory where Oracle is installed. For more information where this is used, see "Installing the software" on page 38.

     Default:   None
     Actual: _____

18.  **Oracle instance identifier** (ORACLE_SID)

This is the name of the unique Oracle system identifier for the Oracle instance. For more information, see "Preparing the Oracle database" on page 30.

Default:   None
Actual: _____

# 4 *Pre-installation*

This chapter describes how to prepare your system for Rational 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:

- "Planning the installation" on page 19
- "Preparing the Rational Synergy installation machine" on page 26
- "Preparing the Oracle database" on page 30
- "Oracle license information" on page 33
- "Installing the Rational license server" on page 34
- "Installing the Rational Directory Server" on page 34

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

## Planning the installation

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

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

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

## *Installation machine requirements*

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

**Note** You must 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 Rational Synergy Readme file for the list of supported systems |
| Database | Oracle10*g* R2 (10.2.0.3), or access to an Oracle10*g* R2 (10.2.0.3), installation area |
| Disk Space | For Solaris: 550 MB<br>For AIX: 500 MB |

### Database server and engine machine requirements

The engine machine hosts the engine processes that access the file system portions of your system. 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 Rational Synergy Readme file.

| Machine Characteristics | Minimum Configuration |
| --- | --- |
| Hardware and Operating System | See the Rational Synergy Readme file 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 partition |
| Required Additional Software | The `tsort` command must be in the path |

## *Client machine requirements*

Each user must run a Rational Synergy interface, and must have access to one or more file systems to use 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 and compile servers.

| Machine Characteristics | Minimum Configuration |
|---|---|
| Hardware and Operating System | See the Rational Synergy Readme file 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 Rational Synergy Readme file for the 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 *IBM Rational Synergy Installation Guide for Windows.*

## *Installation directories*

This section describes the directories used to install Rational Synergy.

- *ccm_home*

    In this guide, the *ccm_home* variable represents the path to the Rational Synergy installation. The default installation directory is `/user/local/ccm`. The installation includes Rational Synergy executables.

    **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 Rational Synergy software without changing your mount options.

    For more information, refer to "Installation machine requirements" on page 20, specifically for disk space requirements for this directory.

    Write your value for *ccm_home* in item 4 on the worksheet on page 14.

- *ccmdb*

    In this guide, the *ccmdb* variable represents the path to the Rational 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 Rational Synergy processes.

    **Note**  Separate programs and data as follows: Install Rational Synergy software into one directory, install the database server files into a different directory, then create the Rational Synergy databases into another directory when you unpack a database.

    Write your value for *ccmdb* in item 6 on the worksheet on page 14.

### *Disk space requirements*

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

| Database Directories | Space Required |
|---|---|
| `ccm_home` (installation) | 750 MB<br>See "Installation machine requirements" on page 20. |
| `ccmdb`<br><br>Starting size per database:<br>3 x the total size of all objects to be controlled.<br><br>**Note** Be sure to allocate generous disk space for the `ccmdb` directory. This is where all controlled file content is stored and where the database typically grows the most.<br><br>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<br>(`ccm_home` + `ccmdb`) | _____ 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 Rational 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 Rational Synergy.

| Purpose | Product | Using NIS | Not Using NIS |
|---|---|---|---|
| Routing | Rational Synergy | master `services` file on the NIS server for each network entry: `ccm7.1_router` | `/etc/services` on every Rational Synergy machine for each network entry: `ccm7.1_router` |
| Passwords | Rational Synergy | master `passwd` file on the NIS server | `/etc/passwd` (and `/etc/shadow`) file on each dbserver |
| Groups | Rational Synergy | master `group` file on the NIS server | `/etc/group` (and `/etc/shadow`) file on each dbserver |
| Hosts | Rational Synergy | master `hosts` file on the NIS or DNS server entries: the dbserver and each engine host | `/etc/hosts` on every machine running Rational Synergy entries: the dbserver and each engine host |
| | | master `hosts.equiv` on the NIS server, or the *ccm_root* `.rhosts` file entries: dbserver and each engine host for user *ccm_root* | `/etc/hosts.equiv` on each dbserver, or the *ccm_root* `.rhosts` file entries: dbserver and each engine host for user *ccm_root* |
| | DCM (and Rational Synergy `platform` attribute) | *ccm_home*`/etc/om_hosts.cfg` *ccm_home*`/etc/remexec.cfg` (For more information, see "Set Up for Remote Command Execution" in the *IBM Rational Synergy Administration Guide*.) | same as using NIS |

# Preparing the Rational Synergy installation machine

Use this information to prepare your Rational Synergy installation machine.

## *Setting up ccm_root and group*

User *ccm_root* owns most of the files and directories, and is the user with permissions to run the administrative commands for Rational Synergy. You must have *ccm_root* defined to install Rational Synergy.

**Note**  If you are not using NIS, set up *ccm_root* on each engine host, using the same numeric user and group IDs on every machine.

Place the `ccm_root` home directory wherever appropriate for your site.

**Note**  Do not install the software into the *ccm_root* home directory.

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

1.  Create the *ccm_root* user.

2.  Create the *ccm_root* group.

    Make *ccm_root* a member of group *ccm_root*.

    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 Rational Synergy on an Linux platform, link `/etc/logingroup` to the `/etc/group` file.

4.  Create `ccm_root` home directory. Write the value for `ccm_root_home` in item 3 on the worksheet on page 13.

The following examples include `/users/ccm_root`:

```
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
```

### *Creating an installation directory*

You must create an installation directory to install Rational Synergy. The installation directory path is *ccm_home*, as described in "ccm_home" on page 23.

The installation directory can be anywhere, and have any name. However, install each Rational Synergy release into a release-specific directory (such as `/usr/local/ccm71`), then link `/usr/local/ccm` to your current default release. This allows more than one installation of Rational Synergy on a machine, which may be necessary if you are upgrading to a new release.

For example, if you have a previous Rational Synergy installation in the `/usr/local/ccm71` directory, install the new version into `/usr/local/ccm71`, then link `/usr/local/ccm` to `/usr/local/ccm71`.

**Note** For more information about multiple installations, see "Creating multiple installations of Rational Synergy" on page 51.

Record the path to this directory in item 4 on the worksheet on page 14.

To create an installation directory, do the following:

1. Log on to 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 "Setting up a UNIX client" on page 58.

## *Setting up the router service*

Rational Synergy requires a dedicated TCP port for its router service. To reserve this port, add a Rational Synergy router service entry to the `/etc/services` file or its NIS equivalent (for more information, see "Routing" in the table on page 25). 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:

```
ccm7.1_router    5412/tcp    # Rational Synergy router port
```

The first column is the service name, which should be `ccm7.1_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, use it because it is reserved for Rational Synergy by the Internet Assigned Number Authority (IANA).

Write the following on the worksheet on page 13:

• Router service host name in item 7 (the default is your *system_name*)

• Unique router service name in item 8

• Unique router service port number in item 9

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

**Note** For heterogeneous installations, you need only one Rational Synergy router process if the *ccm_home*/etc directory is linked to a single location. Even so, you must have separate Rational Synergy router processes for separate releases and for separate networks. For more information, refer to "Creating multiple installations of Rational Synergy" on page 51.

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

### *Identifying the media drive*

Determine the device name of the media drive on the installation machine, and enter the name in item 5 on the worksheet on page 14. You must know the drive location to install Rational 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, see "Downloading the software" on page 37 for more information.

# Preparing the Oracle database

Oracle must already be installed and running before you can use these installation instructions; the instructions do not include information about Oracle database administration.

Also, your database administrator must prepare the Oracle database to run with Rational Synergy by performing the following operations.

## *Creating a tablespace*

You must create a tablespace named ccm in your Oracle database for Rational Synergy data storage. The following SQL statement is an example of creating the ccm tablespace:

```
create tablespace ccm
datafile '/sargasso1/oracle/oradata/sargasso/ccm01.dbf' size
500M
autoallocate extent management local;
```

## *Verifying temporary tablespace*

For Rational Synergy to run, you must have a temp tablespace. Verify that temp tablespace already exists.

### *Setting up authentication*

Two types of authentication are allowed: external or database. You must choose one, as mixed mode authentication is not supported.

- External authentication authenticates users by checking the operating system or network service. This is the default setting.

- Database authentication authenticates users by using a password managed by the Oracle database. This type of authorization only supports a single Oracle database. For information about switching from external to database authentication, see "Switching the authentication mode" on page 35.

## External authentication

1.  Create User OPS$CCM_ROOT

    You must create user OPS$CCM_ROOT in your Oracle database in order for Rational Synergy to run. Use the following SQL statement as an example:

    ```
    create user OPS$CCM_ROOT identified externally
    default tablespace ccm
    temporary tablespace temp
    quota unlimited on ccm;
    ```

2.  Grant Privileges to User OPS$CCM_ROOT

    After creating user OPS$CCM_ROOT, grant the "CREATE SESSION" and "SELECT_CATALOG_ROLE" privileges to user OPS$CCM_ROOT as follows:

    ```
    grant CREATE SESSION, SELECT_CATALOG_ROLE to OPS$CCM_ROOT;
    ```

### *Setting up remote authentication (optional)*

If you plan to run on remote engines, you must enable remote authentication. You must set the initialization parameter as follows.

- Set REMOTE_OS_AUTHENT to TRUE

- Set REMOTE_LOGIN_PASSWORDFILE to EXCLUSIVE

- Set OS_AUTHENT_PREFIX to OPS$

**Database authentication**

For database authentication, you must also set the following parameters:

1. Create user CCM_ROOT

   You must create user CCM_ROOT in your Oracle database in order for Rational Synergy to run. Use the following SQL statement as an example:

   ```
   create user CCM_ROOT identified by ccm_root
   default tablespace ccm
   temporary tablespace temp
   quota unlimited on ccm;
   ```

2. Grant privileges to user CCM_ROOT

   After creating user *CCM_ROOT*, grant the "CREATE SESSION" and "SELECT_CATALOG_ROLE" privileges to user CCM_ROOT as follows:

   ```
   grant CREATE SESSION, SELECT_CATALOG_ROLE to CCM_ROOT;
   ```

3. Make sure `ccmdb auth -d` is run after the installation is completed to set the password of the Oracle database user CCM_ROOT.

## *Potential data loss when Rational Synergy and Oracle database use different character encoding*

If any Rational Synergy client does not use the same character encoding schemes as the underlying Oracle database, certain characters entered into the client may be replaced when they are saved to Oracle, resulting in data loss.

For example, assume the following:

- A user configures an Oracle database to use the 7-bit ASCII character set (US7ASCII).
- A Rational Synergy client runs on a German operating system that uses the 8-bit ISO character set (WE8ISO8859P1).
- A user enters a German character in the Rational Synergy client that is not part of the 7-bit ASCII character set.

The German character is converted as it is saved to the database. Different characters are converted in different ways; for example, the character "ß" is replaced with "?," and the character "ä" is replaced with "a."

To avoid data loss, configure the Oracle database so that its character set is a superset of, or equivalent to, the character sets on all systems that run Rational Synergy clients. For example, if German data is expected to be stored in Rational

Synergy, configure the Oracle database and the client systems to use a character set that supports German characters.

### *Allowing 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.

## Oracle license information

Your Rational Synergy for Oracle license agreement does not license you to use the underlying Oracle database; the Oracle database is separately licensed by Oracle Corporation. Your Oracle license must cover all users who will access a Rational Synergy database.

## Installing the Rational license server

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

For complete information about installing the license, see the *IBM Rational License Server TL Licensing Guide*. Download this document from the IBM Rational Software Information Center site at (`http://publib.boulder.ibm.com/infocenter/rsdp/v1r0m0/index.jsp`).

## Installing the Rational Directory Server

You must install Rational Directory Server (RDS) to run Rational Synergy. RDS is a powerful solution for the centralized database that can be used by the enterprise to store and retrieve the large volume of data. RDS is a separate installation. For complete information on installing RDS, see the Rational Software Information Center at http://publib.boulder.ibm.com/infocenter/rsdp/v1r0m0/index.jsp.

# Switching the authentication mode

The `ccmdb auth` command is used to switch authentication modes. It can also be used to display the current authentication configuration.

```
ccmdb auth [-d|-e]
```

If no option is provided, it will show the current configuration.

## Options

```
-d|-database
```
Sets the authentication to use database authentication.

```
-e|-external
```
Sets the authentication to use external authentication.

Avoid switching from one type of authentication mode to another. If you must switch the authentication mode, use the follow procedures.

## Switching from external to database authentication

1. Back up all the Rational Synergy databases.
2. Perform the steps described earlier to "Create user CCM_ROOT" on page 32 and "Grant privileges to user CCM_ROOT" on page 32.
3. Run `ccmdb auth -d` command to set the database authentication configuration.
4. Delete all the Rational Synergy databases.
5. Unpack all the Rational Synergy databases.

## Switching from database to external authentication

1. Back up all the Rational Synergy databases.
2. Perform the steps described earlier to "Create User OPS$CCM_ROOT" on page 31.
3. Run `ccmdb auth -e` command to set the external authentication configuration.
4. Delete all the Rational Synergy databases.
5. Unpack all the Rational Synergy databases.

# *5* *Installation*

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

**Note**  To install Rational Synergy, you will need the "Rational Synergy installation worksheet" on page 13 that you completed during pre-installation.

## Checklist

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

- "Downloading the software" as described below
- "Installing the software" on page 38
- "Completing the installation" on page 40
- "Starting the Rational Synergy daemons" on page 43

## Downloading the software

Use the following procedure to extract and install download images from the Rational 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 Rational Synergy support site, find the Rational Synergy 7.1 downloads page (for support information, see "Contacting IBM Rational Software Support" on page 3). You will see a single file for each platform; each file is a gzipped tar archive of the Rational 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 "Installing 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.

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

## Installing the software

Install the Rational Synergy software as follows:

**Note**  If you are installing Rational Synergy on a non-local file system, read "Installing onto a remote file system" on page 55 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  | `mount -r -F hsfs /dev/sr0 /cdrom` |
| AIX      | `mount /cdrom` |

**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 5 on the worksheet on page 14).

3.  Set the Oracle home directory and SID.

    ```
    $ ORACLE_SID=sargasso; export ORACLE_SID
    $ ORACLE_HOME=/opt/oracle; export ORACLE_HOME
    ```

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

    **Note**  When running `ccm_install`, you must set the environment variable `ccm_home`. Set `ccm_home` to the path of the directory that is about to be installed if this is your primary installation.Otherwise, set `ccm_home` to the directory already installed for the current platform when installing secondary platform binaries into installation directories with the -p and -d options.

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[latform]` 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` |

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 "Installing onto a remote file system" on page 55.

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 4 and 5 on the worksheet on page 14.

**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.

**Caution** You must set CCM_HOME to your Rational Synergy 7.1 installation directory. Do not leave CCM_HOME set to a previous 7.0 or 6.5 installation, or that installation might be overwritten by Rational Synergy 7.1.

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, license server port number, and Rational Directory Server port number. To answer these prompts, refer to items 7 to 14 on the worksheet on page 14.

# Completing the installation

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

```
ccm_install: Rational Synergy installation succeeded
```

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

- "Setting up the Rational Synergy environment" described below
- "Creating an Oracle database" on page 41
- "Setting up for remote engine hosts (optional)" on page 41

## *Setting up the Rational Synergy environment*

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

1. Copy the X application defaults file for Rational 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* environment variables.

   Some Rational 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
```

## Creating an Oracle database

Ensure that an Oracle database has been created and is open. For more information, see "Preparing the Oracle database" on page 30.

Create a directory for the Rational Synergy databases (for example, `/data/ccmdb`).

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

```
root# mkdir ccmdb
root# chown ccm_root ccmdb
root# chgrp ccm_root ccmdb
root# chmod 755 ccmdb
```
• dbspace must be at least 60 MB.

## Setting up for remote engine hosts (optional)

If you are running Rational 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 *IBM Rational Synergy Administration Guide for UNIX*.

**Note**  You must run the object registrar on your database server if the database 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 *IBM Rational Synergy Administration Guide for UNIX*.

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

## Starting the Rational Synergy daemons

The Rational Synergy daemons must be running before you can start a Rational Synergy session. The `ccm_start_daemons` command starts all daemons on the same machine. For more information, see "Oracle license information" on page 33.

**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 *IBM Rational 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, create boot scripts for this purpose, as described in the *IBM Rational 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 database server if the database 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 *IBM Rational 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 Rational Synergy databases (`ccmdb`) on the database server. If any of the steps in this section fail, contact Rational 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 "Downloading Windows client installations" on page 49.

## Checklist

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

* "Configuring for remote processes (optional)" described below
* "Unpacking a test database" described below
* "Starting a Rational Synergy session" on page 47

## Configuring for remote processes (optional)

To use Rational 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 *IBM Rational Synergy Administration Guide for UNIX*.

## Unpacking 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: *****
    $ ORACLE_SID=sargasso; export ORACLE_SID
    $ ORACLE_HOME=/opt/oracle; export ORACLE_HOME
    $ CCM_HOME=ccm_home; export CCM_HOME
    $ PATH=$CCM_HOME/bin:$PATH; export PATH
    ```

2.  If necessary, create an Oracle user that has the privileges required to unpack a database.

    The ccmdb unpack command will prompt you for an Oracle user that has the privileges required for unpacking a database. You can use the *sys* or *system* Oracle users, both of which have the privileges, or you can create an Oracle user that has the required privileges.

    Note that you cannot enter / (meaning yourself), as this syntax is not supported by the unpack command. You also cannot use the *ccm_root* user (equivalent to OPS$CCM_ROOT).

    The Oracle user must have the following privileges:

    ```
    CREATE USER
    DROP USER
    CREATE ANY INDEX
    DROP ANY INDEX
    CREATE ANY SEQUENCE
    ALTER ANY TABLE
    CREATE ANY TABLE
    INSERT ANY TABLE
    DROP ANY TABLE
    DELETE ANY TABLE
    SELECT ANY TABLE
    UPDATE ANY TABLE
    GRANT ANY OBJECT PRIVILEGE
    SELECT ANY SEQUENCE
    ALTER ANY INDEX
    ALTER ANY TABLE
    ALTER ANY SEQUENCE
    ```

3. 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 *IBM Rational
Synergy Administration Guide for UNIX.*

### Trobleshooting - NLS_LANG and NLS_CHARACTERSET do not match

Rational Synergy for Oracle may encounter problems when mismatching a
client's `NLS_LANG` and a database's `NLS_CHARACTERSET`.

For example, if the client's NLS_LANG is set to
`American_America.WE8ISO8859P1` and the server's `NLS_CHARACTERSET`
is `UTF8`, then `ccmdb unpack` fails with an error like:

```
ERROR: Failed to add record to table attrib (-
1401), terminating
ERROR: Cannot load database.
```

As another example, the Synergy Classic session startup fails with an error like:

```
Warning: The value of the 'active_model' attribute
on the admin
component version, ba, is not a model in this
database.
Warning: Oracle: ORA-03127: no new operations
allowed until the active
operation ends
```

## Starting a Rational Synergy session

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

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

1. Start a Web mode session.

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

2. 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.

3. Monitor the Rational Synergy daemons.

```
$ ccm monitor
```

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

4. Exit both session.

# Downloading 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 Rational 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 11 and 12 in your installation worksheet on page 15.

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: Alternative installations*

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

- "Creating multiple installations of Rational Synergy" described below
- "Running Rational Synergy processes across a network" on page 56
- "Installing onto a remote file system" on page 55
- "Setting up a UNIX client" on page 58
- "ESD authentication through PAM" on page 61

## Creating multiple installations of Rational Synergy

Rational Synergy supports multiple simultaneous installations of the Rational Synergy software. Multiple installations let you use more than one release of Rational Synergy on the same platform, or run binary-incompatible versions on a network of Rational 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 Rational 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 "Installing onto a remote file system" on page 55.

## Installing 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 "Installing the software" on page 38 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 Rational 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/ccm71` directory for the primary installation.

```
root@sol# mkdir /vol/sun/ccm71
root@sol# cd /usr/local
root@sol# ln -s /vol/sun/ccm71 ccm71
root@sol# CCM_HOME=/usr/local/ccm71; export CCM_HOME
root@sol# PATH=$CCM_HOME/bin:$PATH; export PATH
root@sol# cd ccm71
root@sol# /media/ccm/unix/bin/ccm_install -x
```

*media* is item 5 of the worksheet on page 14.

### *Installing 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 "Installing the software" on page 38) for each new Rational Synergy installation directory. The new installation will then have its own $CCM_HOME directory.

For example, suppose the primary installation is ccm71 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 5 of the worksheet on page 14.

Users can then set CCM_HOME to /usr/local/ccm71 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/ccm71; 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
```

### Installing 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 type.

Follow the installation instructions (see "Installing the software" on page 38) for each new Rational 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 `ccm71` on a Solaris file server and you want to install a Linux version onto `/vol/linux/ccm71` on the same machine. The steps are as follows:

1.  Create the secondary, binary-incompatible installation.

    ```
    root@sol# mkdir /vol/linux/ccm71
    root@sol# CCM_HOME=/usr/local/ccm71; export CCM_HOME
    root@sol# PATH=$CCM_HOME/bin:$PATH; export PATH
    root@sol# cd /vol/linux/ccm71
    root@sol# /media/ccm/unix/bin/ccm_install -x -d /vol/linux/ccm71
    -p linux
    ```

    *media* is item 5 of the worksheet on page 14.

    `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 destination is specified using the `-d` option, and the new installation 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/ccm71` command will take users to the appropriate directory (for example, `/vol/sun/ccm71` or `/vol/linux/ccm71`).

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

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

```
root@sol# cd /vol/linux/ccm71
root@sol# mv etc etc_linux
root@sol# ln -s /vol/sun/ccm71/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/ccm71; 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 "Running Rational Synergy processes across a network" on page 56.

   **Note** If you have trouble starting Rational 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.

# Installing 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.

# Running Rational Synergy processes across a network

To run Rational Synergy processes across network installations, all machines share one set of Rational 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 Rational Synergy software on a Linux workstation.

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

## *Rational Synergy daemon processes*

- Router

  You must run one router process for the network Rational Synergy installation. You can run this process on any machine where Rational 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 database host.

- Engine Startup Daemon

  You must run one ESD process on any machine where you will run Rational Synergy engines with secure connections.

- Rational Synergy primary Server

  You must run one primary server for the network Rational Synergy installation. By default, the primary server runs on the same machine as the router. You may run additional CCM servers on other machines. Typically, you would run one CCM server on each database server.

### *Engine processes*

After installing the software on the primary platform, and after installing any secondary platforms onto the file server, you must execute the `ccm_install -l` command once on each engine host. This command and option creates library links in the `/usr/lib` directory, from the local machine to the Oracle installation. You must run the command as *root*.

### *Rational Synergy databases*

You can create Rational Synergy databases on any database server.

# Setting up a UNIX client

You can install Rational 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 Rational Synergy. However, all UNIX clients must be able to access the installation directory.

## *Setting 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 Rational 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 *IBM Rational 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 the *ccm_root* `.rhosts` or `hosts.equiv` file accordingly. (Both files are discussed in the *IBM Rational 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 installation on the server 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 Rational Synergy session.

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

*ccmdb* is the path to the Rational Synergy database.

## *Setting 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 Rational 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 *IBM Rational 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 the *ccm_root* `.rhosts` or `hosts.equiv` file accordingly. (Both files are discussed in the *IBM Rational 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 installation on the server 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 4 in "Installing the software" on page 38.

4. Start a Rational Synergy session.

- Enter the following for a Web mode session:

    $ `cmsynergy -h` *`engine_host_name`* `-d ccmdb`

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

- Enter the following for a traditional mode session:

    $ `cmsynergy -s` *`server_url`* `-d ccmdb`

To set Rational 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 Synergy Classic session, enter the following:

    $ `ccm start -h` *`engine_host_name`* `-rc -d ccmdb`

    *ccmdb* is the path to the 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 computers that run on Solaris and Linux operating 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, refer to your system documentation.

## *Setting 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 `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
```

Change the `$CCM_HOME/etc/ccm.ini` file, not your own `ccm.ini` file.

# *Appendix B: Notices*

© Copyright 1992, 2009

This information was developed for products and services offered in the U.S.A. IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send written license inquiries to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send written inquiries to:

IBM World Trade Asia Corporation
Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106-0032, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:
INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Some states do not allow disclaimer of express or implied warranties in certain transactions. Therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

Intellectual Property Dept. for Rational Software
IBM Corporation
1 Rogers Street
Cambridge, Massachusetts 02142
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

# Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at www.ibm.com/legal/copytrade.html.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft and Windows are trademarks of Microsoft Corporation.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product or service names may be trademarks or service marks of others.

# *Index*

## Symbols

## A

## B

## C

## D

## E