SYBASE®

Installation Guide

Mirror Replication Agent™

15.0

[Linux, Microsoft Windows, and UNIX]

Contents

About This Book

This book describes how to install Sybase® Mirror Replication Agent™ on Linux, Microsoft Windows 2000 and 2003, and UNIX platforms.

Audience

This book is for replication System Administrators and Database Administrators who are responsible for managing a replication system within an enterprise network.

How to use this book

Read Chapter 1, "Preparing for Installation," *before* you unload the Mirror Replication Agent software from the Mirror Activator 15.0 distribution media. Use the Installation and Setup worksheets in Chapter 1 to gather and record the connectivity and configuration information you need to set up the Mirror Replication Agent.

See Chapters 1 and 2 in the Mirror Activator *Administration Guide* for more information about the Mirror Replication Agent system:

- An introduction to the Mirror Activator system and an overview of its topology

- Specific configuration requirements for each Mirror Activator system component

This book provides the following information:

- Chapter 1, "Preparing for Installation," describes basic Mirror Replication Agent system requirements, and provides a worksheet to help you gather and record the configuration information that you need to install the Mirror Replication Agent software and set up the Mirror Replication Agent system.

- Chapter 2, "Installing Mirror Replication Agent," describes how to install the Mirror Replication Agent 15.0 software on a Linux, Microsoft Windows, or UNIX platform. This chapter also describes how to uninstall the software.

Note

- For information about installing the Replication Server® software, see the Replication Server installation and configuration guides for your platform.

- For information about installing the Enterprise Connect™ Data Access (ECDA) Option for Oracle software, see the ECDA installation and configuration guides for your platform.

Related documents   **Mirror Replication Agent**   Refer to the following documents to learn more about the Mirror Replication Agent:

- Mirror Activator *Administration Guide* – for an introduction to the Mirror Activator system, and information about setting up and administering the Mirror Replication Agent and other components of the Mirror Activator system

- Mirror Replication Agent *Primary Database Guide* – for detailed, database-specific information about each database that is supported by the Mirror Replication Agent

- Mirror Replication Agent *Reference Manual* – for information about all Mirror Replication Agent commands and configuration parameters, including syntax, examples, and detailed command usage notes

- Mirror Replication Agent *Release Bulletin* – for last-minute information that was too late to be included in the books

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Note A more recent version of the Mirror Replication Agent release bulletin may be available on the World Wide Web. To check for critical product or document information that was added after the release of the product CD, use the Sybase Technical Library Web site.

Replication Server   Refer to these documents for more information about transaction replication systems and the Replication Server software:

- Replication Server *Installation Guide* – for information about installation and upgrade procedures for all Replication Server products

- Replication Server *Design Guide* – for an introduction to basic transaction replication concepts and Sybase replication technology

- Replication Server *Heterogeneous Replication Guide* – for detailed information about configuring Replication Server and implementing a Sybase replication system with non-Sybase databases

ECDA Option for Oracle Refer to the following document for more information about the ECDA Option for Oracle:

- Enterprise Connect Data Access *Installation Guide* – for information about installation and upgrade procedures for ECDA software

- Enterprise Connect Data Access Option for Oracle *Server Administration and Users Guide* – for information about using ECDA Option for Oracle with the Mirror Activator system components to access remote data.

Java environment The Mirror Replication Agent requires a Java Runtime Environment (JRE) on the Mirror Replication Agent host machine.

- The Mirror Replication Agent release bulletin contains the most up-to-date information about Java and JRE requirements.

- Java documentation available from your operating system vendor describes how to set up and manage the Java environment on your platform.

    Additional information about the Java environment is available at the following URL at http://java.sun.com.

Other sources of information

Use the Sybase Getting Started CD, the SyBooks™ CD, and the Sybase Product Manuals Web site to learn more about your product:

- The Getting Started CD contains release bulletins and installation guides in PDF format, and may also contain other documents or updated information not included on the SyBooks CD. It is included with your software. To read or print documents on the Getting Started CD, you need Adobe Acrobat Reader, which you can download at no charge from the Adobe Web site using a link provided on the CD.

- The SyBooks CD contains product manuals and is included with your software. The Eclipse-based SyBooks browser allows you to access the manuals in an easy-to-use, HTML-based format.

    Some documentation may be provided in PDF format, which you can access through the PDF directory on the SyBooks CD. To read or print the PDF files, you need Adobe Acrobat Reader.

Refer to the *SyBooks Installation Guide* on the Getting Started CD, or the *README.txt* file on the SyBooks CD for instructions on installing and starting SyBooks.

• The Sybase Product Manuals Web site is an online version of the SyBooks CD that you can access using a standard Web browser. In addition to product manuals, you will find links to EBFs/Maintenance, Technical Documents, Case Management, Solved Cases, newsgroups, and the Sybase Developer Network.

To access the Sybase Product Manuals Web site, go to Product Manuals at http://www.sybase.com/support/manuals/.

Sybase certifications on the Web   Technical documentation at the Sybase Web site is updated frequently.

❖ **To find the latest information on product certifications**

1   Point your Web browser to Technical Documents at http://www.sybase.com/support/techdocs/.

2   Click Certification Report.

3   In the Certification Report filter select a product, platform, and time frame and then click Go.

4   Click a Certification Report title to display the report.

❖ **To find the latest information on component certifications**

1   Point your Web browser to Availability and Certification Reports at http://certification.sybase.com/.

2   Either select the product family and product under Search by Base Product; or select the platform and product under Search by Platform.

3   Select Search to display the availability and certification report for the selection.

❖ **To create a personalized view of the Sybase Web site (including support pages)**

Set up a MySybase profile. MySybase is a free service that allows you to create a personalized view of Sybase Web pages.

1   Point your Web browser to Technical Documents at http://www.sybase.com/support/techdocs/.

2   Click MySybase and create a MySybase profile.

Sybase EBFs and software maintenance

❖ **To find the latest information on EBFs and software maintenance**

1 Point your Web browser to the Sybase Support Page at
http://www.sybase.com/support.

2 Select EBFs/Maintenance. If prompted, enter your MySybase user name
and password.

3 Select a product.

4 Specify a time frame and click Go. A list of EBF/Maintenance releases is
displayed.

Padlock icons indicate that you do not have download authorization for
certain EBF/Maintenance releases because you are not registered as a
Technical Support Contact. If you have not registered but have valid
information provided by your Sybase representative or through your
support contract, click Edit Roles to add the "Technical Support Contact"
role to your MySybase profile.

5 Click the Info icon to display the EBF/Maintenance report, or click the
product description to download the software.

Style conventions

The following style conventions are used in this book:

• In a sample screen display, commands that you should enter exactly as
shown appear like this:

```
pdb_setreptable authors, mark
```

• In the regular text of this document, variables or user-supplied words
appear like this:

```
pdb_setreptable table_name, mark
```

where *table_name* is the variable you should replace.

• In the regular text of this document, names of programs, utilities,
procedures, and commands appear like this:

Use the pdb_setreptable command to mark a table for replication.

• In the regular text of this document, names of database objects (tables,
columns, stored procedures, etc.) appear like this:

Check the price column in the widgets table.

• In the regular text of this document, names of datatypes appear like this:

Use the date or datetime datatype.

- In the regular text of this document, names of files and directories appear like this:

  Log files are in the *$SYBASE/MA-15_0/inst_name/log* subdirectory.

Syntax conventions   The following syntax conventions are used in this book:

Table 1: Syntax conventions

Key	Definition
{ }	Curly braces indicate that you must choose at least one of the enclosed options. Do not type the braces when you enter the command.
[ ]	Brackets mean that choosing one or more of the enclosed options is optional. Do not type the brackets when you enter the command.
( )	Parentheses are to be typed as part of the command.
|	The vertical bar means you can select only one of the options shown.
,	The comma means you can choose as many of the options shown as you like, separating your choices with commas that you type as part of the command.

In reference sections of this document, statements that show the syntax of commands appear like this:

    ra_config [*param* [, *value*]]

The words *param* and *value* in the syntax are variables or user-supplied words.

Character case conventions   The following character case conventions are used in this book:

- All command syntax and command examples are shown in lowercase. However, Mirror Replication Agent command names are *not* case sensitive. For example, RA_CONFIG, Ra_Config, and ra_config are equivalent.

- Names of configuration parameters are case sensitive. For example, Scan_Sleep_Max is not the same as scan_sleep_max, and the former would be interpreted as an invalid parameter name.

- Database object names are *not* case sensitive in Mirror Replication Agent commands. However, if you need to use a mixed-case object name in a command (to match a mixed-case object name in the database), you must delimit the object name with quote characters. For example:

      pdb_get_tables "TableName"

Accessibility features
This document is available in an HTML version that is specialized for accessibility. You can navigate the HTML with an adaptive technology such as a screen reader, or view it with a screen enlarger.

Mirror Activator version 15.0 and the HTML documentation have been tested for compliance with U.S. government Section 508 Accessibility requirements. Documents that comply with Section 508 generally also meet non-U.S. accessibility guidelines, such as the World Wide Web Consortium (W3C) guidelines for Web sites.

Note You might need to configure your accessibility tool for optimal use. Some screen readers pronounce text based on its case; for example, they pronounce ALL UPPERCASE TEXT as initials, and MixedCase Text as words. You might find it helpful to configure your tool to announce syntax conventions. Consult the documentation for your tool.

For information about how Sybase supports accessibility, see Sybase Accessibility at http://www.sybase.com/accessibility. The Sybase Accessibility site includes links to information on Section 508 and W3C standards.

If you need help
Each Sybase installation that has purchased a support contract has one or more designated people who are authorized to contact Sybase Technical Support. If you cannot resolve a problem using the manuals or online help, please have the designated person contact Sybase Technical Support or the Sybase subsidiary in your area.

C H A P T E R 1 **Preparing for Installation**

Note In this document, Linux is treated as a UNIX platform, unless the specific context requires a distinction.

Topic	Page
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Reviewing the installation process	8
Completing the Installation and Setup worksheet	11
Using the Installation and Setup worksheet	19

Be sure to read the Mirror Replication Agent version 15.0 *Release Bulletin*, which might contain more up-to-date information than this guide.

Reviewing installation requirements

Review the following installation requirements before you install the Mirror Replication Agent 15.0 software:

- SySAM requirements

- System requirements

- Compatible products

- Graphical user interface

- Team skill requirements

Note If you are migrating from Mirror Replication Agent version 12.6 to version 15.0, see the Mirror Replication Agent *Primary Database Guide* for database-specific details on migration.

SySAM requirements

This section describes the required licensing information that you need to know before you install any of the components of Mirror Replication Agent.

SySAM overview

Sybase Software Asset Management 2.0 (SySAM) is a licensing mechanism that:

- Allows System Administrators to monitor their site's use of Sybase products and optional features
- Records the Sybase software being used and licensed

SySAM verifies that a valid license exists for the Mirror Activator components:

The basic components of SySAM are:

- A license file
- The SySAM software, which consists of a license manager and management utilities

When you install Mirror Replication Agent, a SySAM license manager is automatically installed.

For all SySAM information, refer to the Sybase Software Asset Management 2.0 *User's Guide*.

Mirror Activator components

SySAM checks licenses for the following Mirror Activator components:

- Mirror Replication Agent
- Replication Server, which is described in the Replication Server *Installation Guide*

- *For Oracle only*: Enterprise Connect Data Access (ECDA) Option for Oracle, which is described in the Enterprise Connect Data Access *Installation Guide*

> **Note** Before version 12.5, ECDA Option for Oracle was sold as an individual DirectConnect product named "DirectConnect for Oracle." You will see the name "DirectConnect" used in the software and in documents, including this document.

Before installing Mirror Replication Agent

Before you install Mirror Replication Agent, you must decide whether to configure an unserved license or a network license server. During installation, you may choose either option. In either case, two license files called *license-mrx.lic* and *license-dco.lic* are installed in *$SYBASE/SYSAM-2_0/licenses* (UNIX) or *%SYBASE%\SYSAM-2_0\licenses* (Windows). These licenses activate the use of the Mirror Replication Agent and ECDA Option for Oracle components of Mirror Activator. A Mirror Activator license must be obtained from the Sybase Software Product Download Center (SPDC) Web site and used for the Replication Server component of Mirror Activator.

Licenses for Mirror Replication Agent and ECDA Option for Oracle

When you are installing Mirror Replication Agent, you will see this prompt:

```
Will licenses be obtained from the License Server?
```

- If you answer Yes, you can leave the license files called *license-mrx.lic* and *license-dco.lic* where they were installed (*$SYBASE/SYSAM-2_0/licenses*), or you can move the files to the *SYSAM-2_0/licenses* directory of your SySAM license server. In either case, the Mirror Replication Agent and the ECDA Option for Oracle will validate the necessary licenses.

- If you answer No, no further action is needed. The Mirror Replication Agent will use the license called *license-mrx.lic* where it was installed in *$SYBASE/SYSAM-2_0/licenses*, and the ECDA Option for Oracle will use the license called *license-dco.lic* where it was installed in *$SYBASE/SYSAM-2_0/licenses*.

For more information, refer to the Sybase Software Asset Management 2.0 *User's Guide*.

System requirements

Mirror Replication Agent 15.0 supports these database servers on Linux, Microsoft Windows 2000 and 2003, and UNIX platforms:

- Adaptive Server® Enterprise (ASE)

- Oracle

Java Runtime Environment (JRE)

Because Mirror Replication Agent is a Java-based application, a Java Runtime Environment (JRE) must be installed on the Mirror Replication Agent host machine. A JRE appropriate for your operating system is installed automatically when you install the Mirror Replication Agent software.

Operating system patch levels must be current to support Java 1.4.2. See the following Web sites to determine which patches are required for your platform, and for current information about JREs for your platform:

- For information about JREs on the Linux, Sun Solaris, and Microsoft Windows platforms, see the Web site at http://java.sun.com/j2se

- For information about JREs on AIX platforms, see the Web site at http://www.ibm.com/developerworks/java/jdk

- For information about JREs on HP-UX platforms, see the Web site at http://www.hp.com/products1/unix/java

Platforms and operating systems

The Mirror Replication Agent 15.0 software requires one of the platforms and operating system versions listed in Table 1-1.

Note A Mirror Replication Agent must be installed on a machine from which it can directly access the *transaction* logs of the primary database, or a mirror copy of those *transaction* logs.

Table 1-1: Platform and operating system requirements

Platform	Operating system version
HP 9000(8xx)	HP-UX 11i, 11iR2
IBM RISC System/6000	IBM AIX 5.2, 5.3
Linux/Intel x86	• Red Hat Enterprise Linux 3.0: • Kernel version 2.4.9-e.27 or later • Red Hat Enterprise Linux 4.0: • Kernel version 2.6.9-22.EL • SuSE Linux Enterprise Server 9: • Kernel version 2.6.5-7.191
Microsoft Windows 2000	Windows 2000 v.5.0.2195
Microsoft Windows Server 2003	Windows Server 2003 v.5.2.3790
Sun Solaris (SPARC) system	Sun Solaris 9, 10

Note *Before* you install the Mirror Replication Agent 15.0 software, you must install the most recent operating system patches recommended by your operating system vendor for Java 1.4.2 support.

Table 1-2 lists the minimum physical memory, storage, and media device requirements on the Mirror Replication Agent host machine. However, your Mirror Replication Agent configuration may require more memory and disk space than the minimums listed in Table 1-2.

Table 1-2: Memory, disk space, and media device requirements

Memory	Disk space	Media device
128MB RAM	300MB hard disk	CD-ROM drive

Accommodating the RASD

Each Mirror Replication Agent instance uses an embedded Adaptive Server Anywhere database to manage its Mirror Replication Agent System Database (RASD).

Because the RASD stores information about primary database structure or schema objects, its size depends partly on the number of tables and procedures replicated, and the number of database users in the primary database.

When it replicates a Data Definition Language (DDL) transaction, the Mirror Replication Agent creates a new *version* of the affected object's metadata in its RASD. Over time, the size of the RASD can grow significantly, depending on the number and frequency of DDL transactions replicated.

If the RASD runs out of disk space, the Mirror Replication Agent will shut down and suspend replication. To prevent this, you must provide adequate disk space on the Mirror Replication Agent host machine to accommodate the initial size of the RASD, as well as some potential growth.

See the Mirror Activator *Administration Guide* for more information about the RASD.

Compatible products

Table 1-3 lists the database server versions supported by Mirror Replication Agent 15.0.

Table 1-3: Databases compatible with Mirror Replication Agent

Database	Versions
ASE	12.5.x, 15.0
Oracle Server	9i (9.2.0), 10g (10.1, 10.2)

Mirror Replication Agent requires a JDBC 3.0-compliant driver for the primary data server. Table 1-4 lists the JDBC driver versions required to support connectivity between Mirror Replication Agent 15.0 and the primary data server.

Table 1-4: Drivers compatible with Mirror Replication Agent

Driver	Versions
jConnect JDBC driver	jConnect 6.0 EBF 13862
Oracle JDBC driver	10.1 or 10.2 for JDK 1.4

Mirror Replication Agent 15.0 is compatible with the Sybase products listed in Table 1-5.

Table 1-5: Mirror Replication Agent 15.0 compatibility

Sybase product	Version
Replication Server	12.6, 15.x
Sybase Software Asset Management (SySAM)	2.0

Graphical user interface

The standard installation procedure for Mirror Replication Agent 15.0 software uses the InstallShield wizard in GUI mode (the GUI wizard).

If you want to use the InstallShield GUI wizard to install Mirror Replication Agent on a server without a display, keyboard, and pointing device, you need access to a remote machine with a GUI environment, networked to the Mirror Replication Agent host. Before you start the InstallShield wizard, verify that the remote machine is configured to provide a GUI environment for the server on which the Mirror Replication Agent software will be installed.

Note You can use the InstallShield wizard in console mode to install Mirror Replication Agent from an operating system command prompt, without a GUI environment. See "Installing in console mode" on page 38 for more information.

Team skill requirements

You need team members with specific skills to successfully install and configure a replication environment using Mirror Replication Agent 15.0. For your site, identify the person or team responsible for each skill set listed in Table 1-6.

Table 1-6: Mirror Replication Agent installation skill requirements

Role	Skill set
Operating System Administrator	• Understanding of Linux, Sun Solaris, HP-UX, AIX, or Windows operating system • Knowledge of standards and conventions at the installation site
Disk Replication System Administrator	Knowledge of the disk replication system, including: • Platform and device configuration • Operation and administration tasks
Communications Administrator	• Understanding of connectivity and communication protocols used at your site, such as TCP/IP • Understanding of your site's network configuration • Ability to design, establish, test, and troubleshoot remote communications between the primary database, Mirror Replication Agent, and Replication Server
Replication Server Administrator	• Understanding of Replication Server and the replication system environment • Replication Server administrator privileges
DirectConnect Administrator	• Understanding of DirectConnect and data access from heterogeneous databases • DirectConnect administrator privileges
Primary Database Administrator	• Understanding of the primary database • Primary database administrator privileges

Reviewing the installation process

Installing Mirror Replication Agent software is just one part of the process of setting up a replication system.

Table 1-7 lists the major steps required to set up a replication system to replicate transactions from ASE or an Oracle database in an enterprise network.

Table 1-7: Setting up a Sybase replication system

Step	To do this	Refer to
1	*Install the primary data server.* The primary data server is the source of transactions to be replicated.	• Primary data server documentation • Vendor documentation or Web site for the primary data server
2	*Install the connectivity drivers for the primary database server.* *For Oracle*: You must install the correct JDBC driver for your primary database server. *For ASE*: The JDBC driver is installed as part of the normal Mirror Replication Agent installation process.	• "Setting up connectivity to the primary database" on page 30 in this manual • Vendor documentation or Web site for the primary data server
3	*Implement Disk replication system and devices.* This includes: • Designing the disk mirroring system • Installing appropriate hardware or software • Establishing active mirroring of the Oracle redo logs	Disk replication system vendor and device vendor documentation
4	*Prepare to install Mirror Replication Agent.* This includes: • Reviewing installation requirements and the installation procedure for Mirror Replication Agent. • Completing the Installation and Setup worksheet.	• Chapter 1, "Setup and Configuration," in the Mirror Activator *Administration Guide* • Mirror Replication Agent release bulletin • "Using the Installation and Setup worksheet" on page 19 in this guide.
5	*Install the Mirror Replication Agent software.* **Note** Mirror Replication Agent must be installed on a machine from which it can directly access the mirror copy of the *transaction* logs of the primary database.	"Installing the Mirror Replication Agent software" on page 32 in this guide

Step	To do this	Refer to
6	*Install Replication Server and create connections.* **Note** If you do not use an embedded RSSD (ERSSD) you will need to install an ASE to be used for the RSSD. This includes: • Designing the replication system • Installing Replication Server and its RSSD • Defining connections from Replication Server to the RSSD and routes between Replication Servers • Defining connections using ECDA when replicating to a non-Sybase database	• Sybase installer documentation • Replication Server documentation • Enterprise Connect Data Access (ECDA) documentation
7	*For Oracle only*: *Install ECDA.* This includes: • Installing the ECDA Option for Oracle • Defining connections using ECDA when replicating to a non-Sybase database	• Sybase installation documentation • ECDA documentation
8	*Configure Replication Server and primary data server connections.* This includes: • Creating a Replication Server database connection to the primary data server • Creating a Replication Server login for the Mirror Replication Agent instance • Configuring Mirror Replication Agent parameters • Testing connections between the Mirror Replication Agent and the primary Replication Server, and between the Mirror Replication Agent and the primary data server	Mirror Activator *Administration Guide*, Chapter 3, "Administering Sybase Mirror Replication Agent"
9	*Set up the Mirror Replication Agent instance.* This includes: • Creating the Mirror Replication Agent system objects in the primary database • Marking primary objects for replication	Mirror Activator *Administration Guide*, Chapter 2, "Setup and Configuration"

Step	To do this	Refer to
10	*Prepare for replication.* Refer to the checklist to verify that all of the replication system components are in place before you start replication.	Mirror Activator *Administration Guide,* Chapter 2, "Setup and Configuration"
11	*Materialize subscriptions to primary data*. For each subscription, this process: • Validates and activates the subscription • Populates tables in the replicate database so they are synchronized with the primary database before you start replication	• Replication Server documentation • Mirror Activator *Administration Guide*, Appendix A, "Materializing Databases in a Mirror Activator System"
12	*Start replication.* Put the Mirror Replication Agent instance in the *Replicating* state.	Mirror Activator *Administration Guide*, Chapter 2, "Setup and Configuration"

Completing the Installation and Setup worksheet

The section called "Using the Installation and Setup worksheet" on page 19 provides a place for you to record the information you need to install and configure your replication system.

Note Record all the information in the Installation and Setup worksheet *before* you begin software installation. The worksheet organizes several configuration parameter values and other values that you need to know to install Mirror Replication Agent properly.

Make a copy of the Installation and Setup worksheet, and record the required information as you read through the following sections. You may need to refer to the worksheet often as you install and set up Mirror Replication Agent.

Save a copy of the completed worksheet for your site records, in case you need to refer to it for future installations or upgrades.

Section 1: Mirror Replication Agent administration information

Identify the Mirror Replication Agent instance name, the administration port number, and other administration information, and record them on the worksheet.

❖ **To complete Section 1 of the Installation and Setup worksheet**

1 Determine the Mirror Replication Agent instance type, which determines which primary database server the Mirror Replication Agent will work with.

Instance types are:

- ase – Adaptive Server Enterprise (ASE)

- oracle – Oracle Database Server

Note Mirror Replication Agent must be installed on a machine from which it can directly access the mirror copy of the *transaction* logs of the primary database.

Record the instance type as item 1a on the Installation and Setup worksheet on page 19.

2 Determine the name of the Mirror Replication Agent instance. This name should identify this specific instance.

Record the name of the instance as item 1b on the Installation and Setup worksheet on page 19.

3 Identify the client socket port number of the administration port for this Mirror Replication Agent instance. The port number must be unique on the Mirror Replication Agent host machine.

If you are not the System Administrator for the system on which you are installing the Mirror Replication Agent instance, ask your System Administrator which port number you should use for the Mirror Replication Agent administration port.

Note Port numbers have a range of 1 to 65,535.

Record the port number as item 1c on the Installation and Setup worksheet on page 19.

> **Note** Mirror Replication Agent requires two port numbers. The additional one is for the RASD. By default, Mirror Replication Agent assigns the RASD port—*admin port +1*. This number must also be unique on the Mirror Replication Agent host machine.

4   Determine the location of the interfaces file (*sql.ini* on Windows or *interfaces* on Linux and UNIX).

Use this item only if you plan to use the isql utility, the jisql utility, or Replication Manager (RM) (which is not included in the Mirror Replication Agent installation but is included with Replication Server).

> **Note** The interfaces file must reside on the same machine as the Mirror Replication Agent client (isql or Replication Manager), not necessarily the Mirror Replication Agent host machine.

Record the interfaces file location as item 1d on the Installation and Setup worksheet on page 19.

5   Determine the administrative user ID and password for logging in to the Mirror Replication Agent administration port. Use this information to create the administrative user ID during configuration and setup.

See the Mirror Activator *Administration Guide* for more information.

Record the administrative user ID as item 1e (admin_user) and the password as item 1f (admin_pw) on the Installation and Setup worksheet on page 19.

Section 2: Replication Server parameter values for the primary database connection

Determine the values of the connection parameters for Replication Server. These values are used in the Replication Server create connection command when you create the database connection for the primary database.

See "Setting up connectivity to the primary database" on page 30 for more information about using the Replication Server create connection command.

❖ **To complete Section 2 of the Installation and Setup worksheet**

1 Identify a data server name and a database name representing the primary database connection for the Replication Server.

- For ASE primary databases, the data server name is equal to the *interfaces* file entry name used to identify the ASE server. The database name is the name of the database to be replicated.

- For Oracle, any values can be used. Sybase recommends using the host machine name for data server name, and Oracle SID for the database name.

Record the data server name as item 2a (rs_source_ds) and the database name as item 2b (rs_source_db) on the Installation and Setup worksheet on page 20.

Note These names are case sensitive.

2 Identify the Maintenance User ID and password associated with the Replication Server database connection to the primary database.

The Maintenance User ID must be a valid user ID at the primary database.

Note The Maintenance User ID must not be the user ID of a primary database user who applies transactions that might need to be replicated.

Record the Maintenance User ID as item 2c (Maintenance User) and the password as item 2d (Maintenance User password) on the Installation and Setup worksheet on page 20.

Section 3: Mirror Replication Agent parameter values for Replication Server

Determine and record the values of the Mirror Replication Agent configuration parameters for the primary Replication Server. These values are used with the Mirror Replication Agent ra_config command when you configure the Mirror Replication Agent instance.

For more information about using the ra_config command, see the Mirror Activator *Administration Guide*.

❖ **To complete Section 3 of the Installation and Setup worksheet**

1 Identify the name of the Replication Server host machine.

Record the Replication Server host machine name as item 3a (rs_host_name) on the Installation and Setup worksheet on page 21.

2 Identify the port number of the client socket port for Replication Server.

This is the port number Mirror Replication Agent uses to log in to Replication Server.

Note All port numbers have a range of 1 to 65,535.

Record the port number as item 3b (rs_port_number) on the Installation and Setup worksheet on page 21.

3 Identify the user name and password Mirror Replication Agent uses to log in to Replication Server.

This Replication Server client user ID must have connect source permission in Replication Server. For more information about granting connect source permission, see the Replication Server *Reference Manual*.

If you are not the System Administrator for the system on which you are installing the Mirror Replication Agent instance, ask your System Administrator for the correct user ID and password for the primary Replication Server.

Record the Replication Server client user ID as item 3c (rs_username) and the password as item 3d (rs_password) on the Installation and Setup worksheet on page 21.

4   Identify the Replication Server character set. The value of the primary Replication Server character set (RS_charset) can be found in its configuration file in *$SYBASE/REP-15_0/install/<repinstance>.cfg*, where *<repinstance>* is the name of the Replication Server instance.

Record the character set as item 3e (RS_charset) on the Installation and Setup worksheet on page 21.

Section 4: Mirror Replication Agent parameter values for the ERSSD or RSSD

Determine and record the values of the Mirror Replication Agent configuration parameters for the ERSSD or the RSSD for the primary Replication Server.

Note Mirror Replication Agent supports connection to either ERSSD or RSSD. Because there is no difference in configuration between the two, this section refers to both RSSD and ERSSD installations as "RSSD."

❖   **To complete Section 4 of the Installation and Setup worksheet**

1   Identify the name of the host machine on which the RSSD resides.

Record the name of the host machine as item 4a (rssd_host_name) on the Installation and Setup worksheet on page 22.

2   Identify the port number of the client socket port for the server where the RSSD resides.

Note All port numbers have a range of 1 to 65,535.

Record the port number as item 4b (rssd_port_number) on the "Using the Installation and Setup worksheet" on page 19.

3   Identify the RSSD database name for the primary Replication Server.

Record the RSSD database name as item 4c (rssd_database_name) on the Installation and Setup worksheet on page 22.

4   Identify the user ID and password Mirror Replication Agent uses to access the RSSD for the primary Replication Server.

You must have a Replication Server ID and password. If you do not, contact your Replication Server System Administrator.

Record this RSSD client user ID as item 4d (rssd_username) and record the password as item 4e (rssd_password) on the Installation and Setup worksheet on page 19.

Section 5: Mirror Replication Agent parameter values for the primary data server

Determine and record the values of the Mirror Replication Agent configuration parameters for the primary data server.

❖ **To complete Section 5 of the Installation and Setup worksheet**

1   Identify the name of the primary data server host machine.

Record the host machine name as item 5a (pds_host_name) on the Installation and Setup worksheet on page Installation and Setup worksheet on page 23.

2   Identify the port number of the client socket port for the primary data server.

Note Port numbers have a range of 1 to 65,535.

Record the client socket port number as item 5b (pds_port_number) on the 23.

3   Identify the name of the primary database on the primary data server.

The value of the pds_database_name parameter (worksheet item 5d) can be identical to the value of rs_source_db (worksheet item 2b), as long as the value of the pds_database_name parameter exists as a valid database at the primary database server.

If your primary database server is Oracle, you must use the value of the ORACLE_SID system environment variable (%ORACLE_SID% on Windows, or $ORACLE_SID on UNIX).

Record the database name as item 5d (pds_database_name) on the Installation and Setup worksheet on page 19.

    4   Identify the user ID and password that Mirror Replication Agent uses to log in to the primary data server.

> **Note** This user ID must *not* be the same as the Replication Server maintenance ID for the primary database connection.

This primary data server user ID must have several database-level privileges for the primary database. See the Mirror Replication Agent *Primary Database Guide* for more information.

Record this primary data server user ID as item 5d (pds_username) and the password as item 5e (pds_password) on the Installation and Setup worksheet on page 23.

    5   Identify the character set of the primary database.

For a list of valid Java character sets for your primary database, see Supported Encodings on the Internationalization page under Documentation for the J2SE 1.4.2 JD at http://java.sun.com/j2se/corejava/intl/index.jsp.

Record the name of the equivalent Java character set as item 5f on the Installation and Setup worksheet on page 23.

Section 6: Replication Server parameter values for the replicate data server

Determine and record the values of the parameters for the replicate data server. These values are used in the materialization step.

❖   **To complete Section 6 of the Installation and Setup worksheet**

    1   Identify the name of the replicate data server host machine.

Record the host machine name as item 6a (replicate host name) on the Installation and Setup worksheet on page 24.

    2   Identify the name of the replicate database on the replicate data server.

Record the database name as item 6b (replicate database name) on the Installation and Setup worksheet on page 24.

Using the Installation and Setup worksheet

Make a copy of this worksheet for each Mirror Replication Agent instance you install. Fill out the worksheet before you install the Mirror Replication Agent software.

See the Mirror Replication Agent *Reference Manual* for detailed descriptions of Mirror Replication Agent commands, options, and parameters.

Section 1: Mirror Replication Agent administration information

Item	Description	Example value	Your value
1a	Mirror Replication Agent instance type. The type of primary database the Mirror Replication Agent instance works with.	ase, oracle	
1b	Mirror Replication Agent instance name. A name that is unique among all Mirror Replication Agent instances.	ma_sales_instance	
1c	admin_port The client socket port number for the Mirror Replication Agent administration port. The port number must be unique (not used by any other application on the Mirror Replication Agent host machine). Check with your System Administrator to determine which port numbers are available. **Note** Mirror Replication Agent requires two port numbers. The additional one is for the RASD. By default, Mirror Replication Agent assigns the RASD port—*admin port +1*. This port number must be unique.	10000	
1d	Location of the interfaces file. Use only if you plan to use the isql utility or Replication Manager to administer the Mirror Replication Agent instance.	UNIX: *$SYBASE/interfaces* Windows: *%SYBASE%\ini\sql.ini*	
1e	admin_user The administrative user ID you use to log in to the Mirror Replication Agent instance. The default value is sa.	admin_user	

Item	Description	Example value	Your value
1f	admin_pw The administrative password you use to log in to the Mirror Replication Agent instance. The default value is an empty string ("").	admin_pw	

Section 2: Replication Server parameter values for the primary database connection

Item	Description	Example value	Your value
2a	rs_source_ds The data server name that represents the primary data server to which Replication Server connects. This value is specified in the Replication Server create connection command used to create the Mirror Replication Agent connection in the primary Replication Server.	ma_sales_instance	
2b	rs_source_db The database name that represents the primary database to which Replication Server connects. This value is specified in the Replication Server create connection command used to create the Mirror Replication Agent connection in the primary Replication Server. **Note** Use any name that helps you identify it as the connection to the primary database.	sales_db	
2c	Maintenance User The Replication Server Maintenance User ID associated with the connection to the primary database. Replication Server requires a Maintenance User ID for every database connection. This value is used in the create connection command when you create the connection to the primary database. **Note** This user ID must be valid at the primary database.	maint_user	
2d	Maintenance User password The Replication Server Maintenance User password associated with the connection to the primary database.	maint_pwd	

Section 3: Mirror Replication Agent parameter values for Replication Server

Item	Description	Example value	Your value
3a	rs_host_name	rs_host	
	The name of the Replication Server host machine.		
3b	rs_port_number	1111	
	The port number Mirror Replication Agent uses to log in to Replication Server.		
	Check with your System Administrator to determine which port numbers are available.		
3c	rs_username	rauser	
	The Replication Server client user ID that Mirror Replication Agent uses to log in to the primary Replication Server.		
	This user ID must have connect source authority in the Replication Server.		
	Note The rs_username parameter value and the pdb_maint_user (item 2c) parameter value cannot be the same.		
3d	rs_password	rapwd	
	The Replication Server client user password that Mirror Replication Agent uses.		
3e	rs_charset	iso_1	
	The character set Mirror Replication Agent uses when creating LTL commands for Replication Server.		
	It must match Replication Server's character set as defined by RS_charset in the Replication Server configuration file in *$SYBASE/REP-15_0/install/<repinstance>.cfg*, where *<repinstance>* is the name of the Replication Server instance.		
	Note Set this property to the character set of the *primary* Replication Server. Otherwise, Replication Server incorrectly converts the character set of LTL commands it receives from Mirror Replication Agent. This value may be different from the RA_JAVA_DFLT_CHARSET value (which should match the primary database's character set) so that Mirror Replication Agent correctly converts the character data being replicated. Character set conversion slows performance.		

Section 4: Mirror Replication Agent parameter values for the RSSD

Item	Description	Example value	Your value
4a	rssd_host_name	as_host	
	The name of the host machine on which the RSSD of the primary Replication Server resides.		
4b	rssd_port_number	1111	
	The client socket port number for the RSSD data server.		
	Note Check with your System Administrator to determine which port numbers are available.		
4c	rssd_database_name	rsdb_RSSD	
	The database name of the RSSD of the primary Replication Server.		
4d	rssd_username	rssd_user	
	The RSSD client user ID that Mirror Replication Agent uses to access the RSSD of the primary Replication Server.		
4e	rssd_password	rssd_pass	
	The RSSD client password that Mirror Replication Agent uses.		

Section 5: Mirror Replication Agent parameter values for the primary data server

Item	Description	Example value	Your value
5a	pds_host_name	pds_host	
	The name of the host machine on which the primary data server resides.		
5b	pds_port_number	1111	
	The client socket port number for the primary database gateway server.		
5c	pds_database_name	sales_db	
	The name of the primary database on the primary database server.		
	Mirror Replication Agent uses this value to determine which database is the primary database.		
	Note This name can be the same as the name you gave for item 2b.		
5d	pds_username	pds_user	
	The user ID that Mirror Replication Agent uses to log in to the primary database.		
5e	pds_password	pds_pw	
	The password for pds_username.		
5f	RA_JAVA_DFLT_CHARSET	ISO8859_1	
	The Java-equivalent of the primary database character set.		
	To override the system default, edit the Mirror Replication Agent instance run script called *RUN_xxx,* where *xxx* is the name of your Mirror Repliation Agent instance.		
	Note Unless you want to override the default character set that the JVM finds on your system, you do *not* need to explicitly set the character set-related environment variable, RA_JAVA_DFLT_CHARSET. However, the system default character set must match the character set of the *primary* database.		

Section 6: Replication Server parameter values for the replicate data server

Item	Description	Example value	Your value
6a	Replicate host name	rds_host	
	The name of the host machine on which the replicate data server resides.		
	You need this name when you create subscriptions. See the Replication Server documentation for more information.		
6b	Replicate database name	replicate_db	
	The name of the replicate database on the replicate database server.		
	You need this name when you create subscriptions. See the Replication Server documentation for more information.		
6c	*For Oracle only*: ddl_username	scott	
	The standby database client user ID that Replication Server uses to log in to the standby database to apply DDL commands.		
	This user ID must have authority in the standby database to create any schema or issue any DDL command replicated from the primary database.		
	The Mirror Replication Agent sends this ID and password to Replication Server together with any DDL command executed at the primary database.		
	Note The value for the ddl_username must not be the same as the value of the maintenance user defined in Replication Server for the standby connection.		
6d	*For Oracle only*: ddl_password	tiger	
	The standby database client user password that Replication Server uses with the value for ddl_username.		

See also

The following Mirror Replication Agent guides contain more information about installation and configuration:

- The Mirror Activator *Administration Guide*, for more information about the initial configuration of Mirror Replication Agent parameters for Replication Server.

- The Mirror Replication Agent *Primary Database Guide*, for more information about the initial configuration of the primary database you are replicating.

- The Mirror Replication Agent *Reference Manual*, for more general information about the use of the ra_config command.

- The Replication Server *Reference Manual*, for more information about Replication Server commands and parameters.

CHAPTER 2   **Installing Mirror Replication Agent**

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This chapter describes how to install Mirror Replication Agent version
15.0 software on a Linux, Microsoft Windows, or UNIX platform, and
how to create, configure, and start up a Mirror Replication Agent instance.

Note In this document, Linux is treated as a UNIX platform, unless the
specific context requires a distinction.

Before you begin

Complete the following pre-installation tasks *before* you install the Mirror
Replication Agent 15.0 software:

• Read the release bulletin.

• Plan for system requirements.

• Verify the system environment.

• Complete the Installation and Setup worksheet.

The following sections describe each pre-installation task.

Read the release bulletin

Read the Mirror Replication Agent 15.0 release bulletin for current information about specific requirements of Mirror Replication Agent.

The release bulletin provides:

- Product information that might not be included in the Mirror Replication Agent guides, such as known issues and documentation updates

- Additional information about installing and setting up the Mirror Replication Agent that was not available until after the software and documentation was released

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Note If you are migrating from Mirror Replication Agent version 12.5 or 12.6 to version 15.0, see the Sybase Mirror Replication Agent *Primary Database Guide* for database-specific details on migration.

Plan for system requirements

Installing Mirror Replication Agent requires adequate disk space and RAM on the Mirror Replication Agent host machine. The Mirror Replication Agent host also requires network connectivity to the primary database and the Replication Server, and local access to the mirror log devices.

Note Mirror Replication Agent for ASE and Oracle must be installed on a machine from which it can directly access the ASE and Oracle *transaction* logs or mirror copies of the *transaction* logs.

See "System requirements" on page 4 for more information about:

- Platform and operating system requirements

- Memory, disk space, and media device requirements

- Compatibility with other Sybase products

See the Mirror Replication Agent release bulletin for additional current information about system requirements.

Warning! Do *not* install the Mirror Replication Agent 15.0 software in the same installation directory with the following Sybase products:

- Replication Server® version 12.5 or earlier

- Adaptive Server Enterprise (ASE) version 12.5.0.x or earlier

- Open Client™ or Open Server™ version 12.5.0 or earlier

- OpenSwitch version 12.5 or earlier

- DirectConnect™ version 12.5 or earlier

Doing so incapacitates these products and can adversely affect other Sybase products.

You cannot reverse this with an uninstallation, because that could remove some of the required components of the older Sybase products that were updated by installing Mirror Replication Agent 15.0. For this reason, Sybase recommends that you back up your current Sybase installation directory before installing Mirror Replication Agent 15.0.

Verify the system environment

Before you install the Mirror Replication Agent 15.0 software, verify the following in your Mirror Replication Agent system environment:

- Primary database

  Verify that the primary data server and primary database are online and configured properly for your production systems. For more information, refer to the documentation provided by your database software vendor.

- Replication Server

Verify that the Replication Server is installed, configured, and running. For more information, refer to the Replication Server installation and configuration guides for your platform.

Note Mirror Replication Agent is not dependent on Replication Server or the primary data server for installation. However, it is dependent on them for configuration of an instance.

Complete the Installation and Setup worksheet

Complete the Installation and Setup worksheet in Chapter 1, "Preparing for Installation." The worksheet organizes the Mirror Replication Agent configuration parameter values that you need to set up and configure a Mirror Replication Agent instance.

See "Completing the Installation and Setup worksheet" on page 11 for detailed instructions.

Setting up connectivity to the primary database

Mirror Replication Agent connects to primary data servers using a JDBC driver that implements the JDBC 3.0 standard.

You must install the correct connectivity driver for your primary database environment before installing Mirror Replication Agent.

In general, JDBC drivers are available with client/server products for your database server. Contact your Database Administrator if you are not sure that the correct driver is installed.

The following sections contain procedures for setting up the JDBC drivers for primary data servers.

Note Only *one* version of a primary database vendor's JDBC driver should be in the CLASSPATH; otherwise, Mirror Replication Agent might have problems connecting to the primary database.

ASE JDBC driver

The ASE JDBC driver (jConnect™) is installed and configured with the installation of the Mirror Replication Agent software.

Oracle JDBC drivers

JDBC drivers for Oracle databases are provided by Oracle.

If the JDBC driver for your database is not already installed, obtain the appropriate driver from the Oracle Web site at http://technet.oracle.com/software/tech/java/sqlj_jdbc/content.html.

❖ **To obtain the latest Oracle 10.2 driver for JDK 1.4**

1 Select the link to the Oracle Database 10g Release 2 drivers.

2 Select the *ojdbc14.jar* classes for use with JDK 1.4 and JDK 1.5.

❖ **To set the CLASSPATH environment variable**

1 Install the JDBC driver on the machine on which Mirror Replication Agent resides or where Mirror Replication Agent can access it.

2 Add the location of the JDBC driver to the CLASSPATH environment variable.

• For UNIX:

Add this line to the *.login* file of the user account that is used to start and stop the Mirror Replication Agent instance:

```
setenv CLASSPATH /path_name/driver:$CLASSPATH
```

where:

• *path_name* is the name of the path where you installed the JDBC driver.

• *driver* is the name of the JDBC driver.

You must log out and log back in for this change to take effect, or issue the command source .login after the change.

• For Windows:

Go to Start | Settings | Control Panel |System | Environment, and add this line to the existing CLASSPATH environment variable, using the semicolon (;) as the path separator, or create the path in the User Variables window:

`drive:\path_name\driver`

where:

- *drive* is the drive letter.

- *path_name* is the name of the path where you installed the Oracle JDBC driver.

- *driver* is the name of the JDBC driver.
  For Oracle, the name is *ojdbc14.jar*.

Click Apply, then OK.

3   The Oracle primary server must be running the Transparent Network Substrate (TNS) Listener Service. For more information about TNS, see the *Oracle Database Net Services Administrator's Guide*.

Installing the Mirror Replication Agent software

The Mirror Replication Agent 15.0 product is distributed on the Mirror Activator 15.0 distribution media. See the Mirror Replication Agent release bulletin for the current distribution media catalog numbers.

Note Mirror Replication Agent must be installed on a machine from which it can directly access the *transaction* logs or a mirror copy of the *transaction* logs of the primary database.

The following sections describe how to install the Mirror Replication Agent 15.0 software on a Linux, Microsoft Windows, or UNIX platform, using InstallShield:

- "Installing with the GUI wizard" on page 33

- "Installing in console mode" on page 38

All procedures give you the following installation options:

• *Typical* – The Mirror Replication Agent software product will be installed with the recommended products and features.

• *Custom* – From a list of all products and features on the CD, you can select the specific products and features that you want to install.

The following products and features are included on the Mirror Activator 15.0 distribution media:

• Mirror Replication Agent 15.0

• SySAM 2.0 (the Sybase Software Asset Management license manager)

If you encounter problems while installing, see "Installation troubleshooting" on page 47.

Note

• For information about installing the Replication Server software, see the Replication Server installation and configuration guides for your platform.

• For information about installing the Enterprise Connect Data Access (ECDA) Option for Oracle software, see the ECDA installation and configuration guides for your platform.

Installing with the GUI wizard

This installation procedure uses the InstallShield wizard in GUI mode (the GUI wizard), which requires one of the following:

• A GUI environment (with a display, keyboard, and pointing device) on the Mirror Replication Agent host machine, or

• A remote machine configured to provide a GUI environment for the Mirror Replication Agent host machine.

See "Installing in console mode" on page 38 for information about installing the Mirror Replication Agent software in an interactive text (or console) mode.

❖ **To install Mirror Replication Agent with the GUI wizard**

1 Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2 Close all nonessential applications, and minimize any open windows.

3 Insert the Mirror Activator 15.0 distribution CD in the CD-ROM drive.

4 Start the InstallShield GUI wizard:

- On Microsoft Windows platforms, the InstallShield GUI wizard should start automatically.

  If the GUI wizard does not start automatically, select Start | Run, and enter the following in the Open box:

  ```
  x:\setupwin32.exe
  ```

  where *x:* is your CD-ROM drive.

  You can also start the GUI wizard from Windows Explorer by double-clicking the *setupwin32.exe* file icon.

- On UNIX platforms, enter this at the command prompt:

  ```
  cd /cdrom
  ./setup_type
  ```

  where *setup_type* is one of these strings that corresponds to the UNIX platform type:

  - setupaix
  - setuphp11x
  - setupsolaris
  - setuplinux

5 Click Next to continue.

> **Note** You can click Cancel to exit the GUI wizard and stop the installation at any point before it is complete.

6 Select your geographic location in the license agreement and copyright notice window.

7 Read the Sybase license agreement and select I Agree.

> **Note** You must agree to the terms of the software license before you can continue the installation.

Click Next to continue.

8 Specify an installation directory in the Destination window.

The default installation directory is:

•   On Windows platforms:

%SYBASE% or *c:\sybase*

•   On UNIX platforms:

$SYBASE or */opt/sybase*

Click Next to accept the default installation directory, or do one of the following:

•   Click Browse to select an installation directory in the file browser, and then click Next, or

•   Enter a directory name in the Destination Directory box, and then click Next.

If you enter a directory name that does not exist, InstallShield prompts:

```
The directory does not exist.
Do you want to create it?
```

Click Yes to create the installation directory you specified.

If the directory you specified (either by default or by entering a directory name) exists, InstallShield prompts:

```
You have chosen to install into an existing
directory. Any older versions of the products you
choose to install that are detected in this
directory will be replaced. Do you want to
continue with installation into this directory?
```

If you click Yes, and:

•   The Sybase products were installed with Studio Installer (for example, Replication Server version 12.5), then InstallShield overwrites the common components.

- The products were installed with InstallShield, then InstallShield determines the correct course of action.

Note On Microsoft Windows platforms, if you are prompted to overwrite a DLL, click Yes *only* if the version of the new DLL is newer than the one InstallShield is attempting to overwrite.

---

9 Select the type of installation from two options:

Typical If you choose Typical, InstallShield displays the following products and features:

- Mirror Replication Agent 15.0
- SySAM License Server
- SySAM License Utilities

Custom If you choose Custom, InstallShield displays the same products and features as the Typical installation list, with check boxes that allow you to select the specific products and features you want to install.

- Mirror Replication Agent 15.0
- SySAM License Server
- SySAM License Utilities

After you select the products and features for a Custom installation and click Next, InstallShield displays the products and features you selected.

10 Click Next to continue.

InstallShield installs the components in the installation directory you specified and displays an installation progress indicator.

If errors occur during the installation, InstallShield displays error messages. In the event of an installation error, exit the InstallShield wizard to correct the cause of the error, and then restart InstallShield. For more information, see "Installation troubleshooting" on page 47.

If the software is installed successfully, InstallShield displays a window confirming the successful installation. Click Next.

11 The SySAM License Server window opens and displays this prompt:

```
Will licenses be obtained from the License
Server?
```

- If you answer Yes, you can leave the *license-mrx.lic* and *license-dco.lic* license files where they were installed (*$SYBASE/SYSAM-2_0/licenses*), or you can move the files to the *SYSAM-2_0/licenses* directory of your SySAM license server. In either case, the Mirror Replication Agent and ECDA Option for Oracle will verify the necessary licenses.

- If you answer No, no further action is needed. The Mirror Replication Agent and the ECDA Option for Oracle will use the installed licenses (*license-mrx.lic* and *license-dco.lic*) as they were installed in *$SYBASE/SYSAM-2_0/licenses*.

    Click Next.

12 The SySAM notification window prompts you to configure your server for e-mail notification. When configuration is enabled, you receive information about license management events that require attention. Select Yes and either accept the default values that are supplied, or these values from your worksheet:

- SMTP server host name

- SMTP server port number

- Sender e-mail

- Recipients e-mail

- Message severity level of an event that will trigger e-mail:

    - Informational

    - Warning

    - Error

    If you choose not to have e-mail alerts or severity messages logged, select No.

    Click Next.

13 Click Finish to complete the installation and close InstallShield.

To verify that the software components were installed correctly, see "Verifying the installation" on page 53.

Post-installation task   After you complete the Mirror Replication Agent software installation, you must complete the following post-installation task:

- Set up the SYBASE environment on the Mirror Replication Agent host machine. For more information, see "Setting up the SYBASE environment" on page 48.

Installing in console mode

You can install the Mirror Replication Agent software in an interactive text (or console) mode, using the same steps as those described in "Installing with the GUI wizard" on page 33, except that:

- You invoke the InstallShield wizard at the command prompt, using the -console option, and

- You use only the keyboard to select all of the installation options.

This installation procedure uses the InstallShield wizard in console mode, which requires either:

- A display and keyboard on the Mirror Replication Agent host machine, or

- A display and keyboard on a remote machine configured to control the Mirror Replication Agent host machine.

Note This installation procedure does *not* require a pointing device or a GUI environment to install the Mirror Replication Agent software.

See "Installing with the GUI wizard" on page 33 for information about installing the Mirror Replication Agent software in a GUI environment.

❖ **To install the Mirror Replication Agent in console mode**

1 Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2 Close all non-essential applications, and minimize any open windows.

3   Insert the Mirror Activator 15.0 distribution CD in the CD-ROM drive.

> **Note** If the InstallShield GUI wizard starts automatically on a Microsoft Windows platform, click Cancel to exit the GUI wizard.

4   Open an operating system command window, and set the CD-ROM drive as the current drive.

5   Start the InstallShield wizard in console mode:

   •   On Microsoft Windows:

          setupwin32 -console

   •   On UNIX:

          ./*setup_type* -console

       where *setup_type* is one of the following strings that corresponds to the UNIX platform type:

       •   setupaix

       •   setuphp11x

       •   setupsolaris

       •   setuplinux

       The InstallShield wizard starts and displays the Welcome message.

6   Follow the remaining wizard prompts to install the Mirror Replication Agent 15.0 software.

    See "Installing with the GUI wizard" on page 33 for a description of all of the wizard prompts.

    InstallShield installs the components in the installation directory you specified, and displays an installation progress indicator.

If errors occur during the installation, exit the InstallShield wizard to correct the cause of the error, and then restart InstallShield. For more information, see "Installation troubleshooting" on page 47.

If the software is installed successfully, InstallShield displays a message confirming the successful installation.

To verify that the software components were installed correctly, see "Verifying the installation" on page 53.

Post-installation tasks   After you complete the Mirror Replication Agent software installation, you must complete the following post-installation task:

- Set up the SYBASE environment on the Mirror Replication Agent host machine. See "Setting up the SYBASE environment" on page 48 for more information.

Using a response file for installation

A response file contains responses to all of the InstallShield wizard prompts. You can install the Mirror Replication Agent 15.0 software using a response file in either console mode or silent mode.

These sections describe how to use a response file for installation:

- Creating a response file
- Installing in console mode with a response file
- Installing in silent mode

Creating a response file

There are two ways to create a response file:

- Edit a *template* file that contains default responses to all of the wizard prompts.
- Record the actual responses to InstallShield wizard prompts while the InstallShield wizard runs in either GUI mode or console mode.

  Note Recording responses to the InstallShield wizard installs the Mirror Replication Agent software, and then generates the template file *after* the installation is complete.

You can create a template file without running the InstallShield wizard (and installing the software) by invoking the InstallShield wizard at the command prompt with the -options-template option.

You can record your responses to the InstallShield wizard in either GUI mode or console mode, while installing the software, by invoking the InstallShield wizard at the command prompt with the -options-record option.

Use one of the following procedures to create a response file.

❖   **To create a response file from a template**

1   Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2   Close all non-essential applications, and minimize any open windows.

3   Insert the Mirror Activator 15.0 distribution CD in the CD-ROM drive.

> **Note** If the InstallShield GUI wizard starts automatically on a Microsoft Windows platform, click Cancel to exit the GUI wizard.

4   Open an operating system command window, and set the CD-ROM drive as the current drive.

5   Invoke the InstallShield wizard at the command prompt, using the -options-template option:

   •   On Microsoft Windows:

```
setupwin32 -options-template MA.resp
```

   where *MA.resp* is the full path to the response (template) file you want to create.

   (Note that there is no space in the -options-template string.)

   •   On UNIX:

```
./setup_type -options-template MA.resp
```

   where:

   •   *setup_type* is one of the following strings that corresponds to the UNIX platform type:

      •   setupaix

      •   setuphp11x

      •   setupsolaris

      •   setuplinux

   •   *MA.resp* is the full path to the response (template) file you want to create.

   (Note that there is no space in the -options-template string.)

InstallShield creates a template response file with the name you specified. The template file contains the default responses for each wizard prompt.

6   Use your preferred text editor to edit the template file, and record the values you want to use to install the Mirror Replication Agent software.

❖   **To create a response file by recording a GUI installation**

1   Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2   Close all non-essential applications, and minimize any open windows.

3   Insert the Mirror Activator 15.0 distribution CD in the CD-ROM drive.

Note If the InstallShield GUI wizard starts automatically on a Microsoft Windows platform, click Cancel to exit the GUI wizard.

---

4   Open an operating system command window, and set the CD-ROM drive as the current drive.

5   Invoke the InstallShield wizard at the command prompt, using the -options-record option:

- On Microsoft Windows:

  ```
  setupwin32 -options-record MA.resp
  ```

  where *MA.resp* is the full path to the response (template) file you want to create.

  (Note that there is no space in the -options-record string.)

- On UNIX:

  ```
  ./setup_type -options-record MA.resp
  ```

  where:

  - *setup_type* is one of the following strings that corresponds to the UNIX platform type:

    - setupaix

- setuphp11x

- setupsolaris

- setuplinux

- *MA.resp* is the full path to the response (template) file you want to create.

(Note that there is no space in the -options-record string.)

The InstallShield wizard starts in GUI mode, and it captures all of the prompt responses in a file with the name you specified.

See "Installing with the GUI wizard" on page 33 for a description of all of the wizard prompts.

In the event of an installation error, exit the InstallShield wizard to correct the cause of the error, and then restart InstallShield. For more information, see "Installation troubleshooting" on page 47.

❖ **To create a response file by recording a console installation**

1   Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2   Close all non-essential applications, and minimize any open windows.

3   Insert the Mirror Replication Agent 15.0 distribution CD in the CD-ROM drive.

> **Note** If the InstallShield GUI wizard starts automatically on a Microsoft Windows platform, click Cancel to shut down the GUI wizard.

4   Open an operating system command window, and set the CD-ROM drive as the current drive.

5   Invoke the InstallShield wizard at the command prompt, using both the -console and -options-record options:

- On Microsoft Windows:

```
setupwin32 -console -options-record MA.resp
```

where *MA.resp* is the full path to the response (template) file you want to create.

(Note that there is no space in the -options-record string.)

- On UNIX:

      ./*setup_type* -console -options-record *MA.resp*

  where:

  - *setup_type* is one of the following strings that corresponds to the UNIX platform type:

    - setupaix

    - setuphp11x

    - setupsolaris

    - setuplinux

  - *MA.resp* is the full path to the response (template) file you want to create.

  (Note that there is no space in the -options-record string.)

  The InstallShield wizard starts in console mode, and it captures all of the prompt responses in a file with the name you specified.

  See "Installing with the GUI wizard" on page 33 for a description of all of the wizard prompts.

  In the event of an installation error, exit the InstallShield wizard to correct the cause of the error, then restart InstallShield. For more information, see "Installation troubleshooting" on page 47.

Installing in console mode with a response file

A console mode installation using a response file allows you to accept all of the defaults as you move through an interactive text installation, because all of the default values are supplied by the response file.

Follow the same steps as you would for a standard console mode installation, but invoke the InstallShield wizard at the command prompt as follows:

- On Microsoft Windows:

      setupwin32 -console -options *MA.resp*
          -W SybaseLicense.agreeToLicense=true

  where *MA.resp* is the full path to the response file.

• On UNIX:

```
./setup_type -console -options MA.resp
    -W SybaseLicense.agreeToLicense=true
```

where:

• *setup_type* is one of the following strings that corresponds to the UNIX platform type:

  • setupaix

  • setuphp11x

  • setupsolaris

  • setuplinux

• *MA.resp* is the full path to the response file.

Note The -W SybaseLicense.agreeToLicense=true command option makes your agreement with the Sybase License Agreement the default option in the console mode installation.

See "Installing with the GUI wizard" on page 33 for a description of all of the wizard prompts.

In the event of an installation error, exit the InstallShield wizard to correct the cause of the error, then restart InstallShield. For more information, see "Installation troubleshooting" on page 47.

To verify that the software components were installed correctly, see "Verifying the installation" on page 53.

Post-installation task   After you complete the Mirror Replication Agent software installation, you must set up the SYBASE environment on the Mirror Replication Agent host machine. For more information, see "Setting up the SYBASE environment" on page 48.

Installing in silent mode

The InstallShield silent mode, sometimes referred to as an "unattended installation," allows you to install the software with a response file to set default values, without any interaction required on your part.

Follow the same steps as you would for a standard console mode installation, but invoke the InstallShield wizard at the command prompt as follows:

- On Microsoft Windows:

```
setupwin32Console.exe -silent -options MA.resp
    -W SybaseLicense.agreeToLicense=true
```

where *MA.resp* is the full path to the response file.

Warning! When you run a silent installation, Sybase recommends that you use the *setupwin32Console.exe* executable, which runs in the foreground. The normal *setupwin32.exe* executable runs in the background, giving you the false impression that the installation has terminated immediately, without a completion status. This could result in duplicate installation attempts.

- On UNIX:

```
./setup_type -silent -options MA.resp
    -W SybaseLicense.agreeToLicense=true
```

where:

- *setup_type* is one of the following strings that corresponds to the UNIX platform type:

  - setupaix

  - setuphp11x

  - setupsolaris

  - setuplinux

- *MA.resp* is the full path to the response file.

Note The -W SybaseLicense.agreeToLicense=true command option makes your agreement with the Sybase License Agreement the default option in the silent mode installation.

In the event of an installation error, see "Installation troubleshooting" on page 47.

To verify that the software components were installed correctly, see "Verifying the installation" on page 53.

Post-installation task
After you complete the Mirror Replication Agent software installation, you must set up the SYBASE environment on the Mirror Replication Agent host machine. For more information, see "Setting up the SYBASE environment" on page 48.

Installation troubleshooting

If you encounter errors during installation, invoke the InstallShield wizard with the -is:log option to record the installation errors in a log file. After the wizard runs, check the log file to view a record of the installation process.

You can record installation errors with the InstallShield wizard in either GUI or console mode (with or without a response file) and in silent mode.

Use the following procedure to record an installation log file with the InstallShield wizard in GUI mode.

❖ **To record an installation log file**

1 Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2 Close all non-essential applications, and minimize any open windows.

3 Insert the Mirror Activator 15.0 distribution CD in the CD-ROM drive.

> **Note** If the InstallShield GUI wizard starts automatically on a Microsoft Windows platform, click Cancel to exit the GUI wizard.

4 Open an operating system command window, and set the CD-ROM drive as the current drive.

5 Invoke the InstallShield wizard at the command prompt, using the -is:log option:

• On Microsoft Windows:

        setupwin32 -log # @ALL -is:log *MA_err.log*

where:

• -log # @ALL causes installation debug information to be written to *$SYBASE/log,txt* file.

• *MA_err.log* is the full path to the installation error log file you want to create.

• On UNIX:

        ./*setup_type* -log # @ALL -is:log *MA_err.log*

where:

- *setup_type* is one of the following strings that corresponds to the UNIX platform type:

  - setupaix

  - setuphp11x

  - setupsolaris

  - setuplinux

- *MA_err.log* is the full path to the installation error log file you want to create.

Note You can use the -is:log <*path to log*> option, along with the -console or -silent options, to record an installation log file in non-GUI wizard modes.

---

6 Follow the wizard prompts to install the Mirror Replication Agent software.

For a description of all of the wizard prompts, see "Installing with the GUI wizard" on page 33.

InstallShield attempts to install the software, and creates an installation log file with the name you specified.

7 After the wizard exits, examine the contents of the *installation log* file (*MA-err.log* file as specified in step 5) and the *log.txt* file in the installation directory to determine the cause of the errors.

Setting up the SYBASE environment

After you install the Mirror Replication Agent 15.0 software and *before* you start the Mirror Replication Agent or run any Mirror Replication Agent utilities, you must set up the SYBASE environment on the Mirror Replication Agent host machine.

Setting up the SYBASE environment sets the value of an environment variable (%SYBASE% on Microsoft Windows platforms and $SYBASE on UNIX platforms) to point to the Mirror Replication Agent installation directory.

❖ **To set up the SYBASE environment**

1   Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2   At the command prompt, execute the *SYBASE* batch or script file:

• On Microsoft Windows:

```
c:\%SYBASE%\SYBASE
```

where *%SYBASE%* is the path to the Mirror Replication Agent installation directory.

• On UNIX:

```
source $SYBASE/SYBASE.csh
```

where *$SYBASE* is the path to the Mirror Replication Agent installation directory.

Uninstalling the Mirror Replication Agent software

InstallShield includes an Uninstall wizard that removes the Mirror Replication Agent 15.0 software and its related components.

You can run the Uninstall wizard in either GUI mode or console mode. Sybase recommends that you use the GUI mode.

InstallShield removes only the files and directories for the products and features that you select in the Uninstall wizard. However, some files (such as log and configuration files) are left intact for administrative purposes, even if you choose to uninstall all of the products and features.

Note InstallShield does *not* remove the root installation directory (*%SYBASE%* or *$SYBASE*) or the *SYSAM-2_0* directory and its subdirectories.

Uninstalling on a Windows platform

Before uninstalling the Mirror Replication Agent software, you must:

- Log in to the Mirror Replication Agent host machine using an account with administrator privileges.

- Shut down all Mirror Replication Agent instances and all other processes for the components you are uninstalling.

Use one of the following procedures to uninstall the Mirror Replication Agent software on a Microsoft Windows platform.

❖ **To uninstall in GUI mode on Windows platforms**

1 Choose **one** of the following methods to start the Uninstall wizard in GUI mode:

- From the Start menu, select Settings | Control Panel | Add/Remove Programs.

- Enter this at the command prompt:

        %SYBASE%\uninstall\MA-15_0\uninstaller

- Click Start | Run and then enter:

        %SYBASE%\uninstall\MA-15_0\uninstaller

- In Windows Explorer, double-click the *uninstaller.exe* file icon.

The Uninstall window opens.

2 Click Next.

3 Select the products and features that you want to uninstall from the list of installed products and features, then click Next.

The default option is *all* installed products and features.

4 Verify the summary information, and then click Next.

InstallShield removes the files and directories associated with the products and features you selected.

5 Click Finish.

Note You may be prompted whether to remove shared files. Sybase recommends that you do *not* remove shared files.

❖ **To uninstall in console mode on Windows platforms**

    1   Open an operating system command window.

    2   Set the Sybase installation directory as the current directory:

```
cd %SYBASE%
```

        where *%SYBASE%* is the path to the Mirror Replication Agent installation directory.

    3   Invoke the Uninstall wizard at the command prompt, using the -console option:

```
uninstall\MA-15_0\uninstaller -console
```

        The Uninstall wizard displays the Welcome window.

    4   Follow the remaining Uninstall wizard prompts to uninstall the Mirror Replication Agent software.

> **Note** You may be prompted to decide whether to remove shared files. Sybase recommends that you do *not* remove shared files.

Uninstalling on a UNIX platform

Before uninstalling the Mirror Replication Agent software, you must:

- Log in to the Mirror Replication Agent host machine using an account with administrator privileges.

- Shut down all Mirror Replication Agent instances and all other processes for the components you are uninstalling.

Use one of the following procedures to uninstall the Mirror Replication Agent software on a UNIX platform.

❖ **To uninstall in GUI mode on UNIX platforms**

    1   Invoke the Uninstall wizard at the command prompt:

```
$SYBASE/uninstall/MA-15_0/uninstaller
```

        where *$SYBASE* is the path to the Mirror Replication Agent installation directory.

        The Uninstall window opens.

    2   Click Next.

3   Select the products and features that you want to uninstall from the list of installed products and features, then click Next.

The default option is *all* installed products and features.

4   Verify the summary information, then click Next.

InstallShield removes the files and directories associated with the products and features you selected.

5   Click Finish.

Note You may be prompted to decide whether to remove shared files. Sybase recommends that you do *not* remove shared files.

❖   **To uninstall in console mode on UNIX platforms**

1   Open an operating system command window.

2   Set the Sybase installation directory as the current directory:

```
cd $SYBASE
```

where *$SYBASE* is the path to the Mirror Replication Agent installation directory.

3   Invoke the Uninstall wizard at the command prompt, using the -console option:

```
uninstall/MA-15_0/uninstaller -console
```

The Uninstall wizard displays the Welcome window.

4   Follow the remaining Uninstall wizard prompts to uninstall the Mirror Replication Agent software.

Note You may be prompted to decide whether to remove shared files. Sybase recommends that you do *not* remove shared files.

Verifying the installation

InstallShield creates subdirectories in the Mirror Replication Agent installation directory (*%SYBASE%* on Microsoft Windows platforms and *$SYBASE* on UNIX platforms) for the Mirror Replication Agent 15.0 software, and other specific software that the Mirror Replication Agent requires.

SYBASE environment scripts

InstallShield creates SYBASE environment scripts that set the SYBASE environment variable for the Mirror Replication Agent host machine. These scripts allow you to run the Mirror Replication Agent software and its utilities from any directory on the host machine.

The SYBASE environment scripts are created in the Sybase installation directory and named as follows:

•   On Microsoft Windows:

    SYBASE.bat

•   On UNIX:

    SYBASE.sh or *SYBASE.csh*

You can use these scripts to permanently set the environment variables, or you can use them to temporarily change environment variables by running (or sourcing) the scripts each time you log in to the Mirror Replication Agent host machine.

Note On Microsoft Windows platforms, InstallShield sets up the SYBASE environment variable automatically when you install the Mirror Replication Agent software.

For more information, see "Setting up the SYBASE environment" on page 48.

What's next

Refer to the Mirror Activator *Administration Guide* for information about creating a Mirror Replication Agent instance and setting up the Mirror Activator system.

Note If you are migrating from Mirror Replication Agent version 12.6 to version 15.0, see the Sybase Mirror Replication Agent *Primary Database Guide* for database-specific details on migration.

Glossary

This glossary describes Mirror Replication Agent terms used in this book.

Adaptive Server   The brand name for Sybase relational database management system (RDBMS) software products.

- *Adaptive Server Enterprise* manages multiple, large relational databases for high-volume online transaction processing (OLTP) systems and client applications.

- *Adaptive Server IQ* manages multiple, large relational databases with special indexing algorithms to support high-speed, high-volume business intelligence, decision support, and reporting client applications.

- *Adaptive Server Anywhere* manages relational databases with a small DBMS footprint, which is ideal for embedded applications and mobile device applications.

See also **DBMS** and **RDBMS**.

ASE   *ASE (Adaptive Server Enterprise)* manages multiple, large relational databases for high-volume online transaction processing (OLTP) systems and client applications.

atomic materialization   A materialization method that copies subscription data from a primary database to a standby database in a single, atomic operation. No changes to primary data are allowed until the subscription data is captured at the primary database. See also **bulk materialization** and **nonatomic materialization**.

BCP utility   A bulk copy transfer utility that provides the ability to load multiple rows of data into a table in a target database. See also **bulk copy**.

bulk copy   An Open Client interface for the high-speed transfer of data between a database table and program variables. It provides an alternative to using SQL insert and select commands to transfer data.

bulk materialization	A materialization method whereby subscription data in a standby database is initialized outside of the replication system. You can use bulk materialization for subscriptions to table replication definitions or function replication definitions. See also **atomic materialization** and **nonatomic materialization**.
client	In client/server systems, the part of the system that sends requests to servers and processes the results of those requests. See also **client application**.
client application	Software that is responsible for the user interface, including menus, data entry screens, and report formats. See also **client**.
commit	An instruction to the DBMS to make permanent the changes requested in a transaction. See also **transaction**. Contrast with **rollback**.
data client	A client application that provides access to data by connecting to a data server. See also **client**, **client application**, and **data server**.
data distribution	A method of locating (or placing) discrete parts of a single set of data in multiple systems or at multiple sites. Data distribution is distinct from data replication, although a data replication system can be used to implement or support data distribution. Contrast with **data replication**.
data replication	The process of copying data to remote locations, and then keeping the replicated data synchronized with the primary data. Data replication is distinct from data distribution. Replicated data is stored copies of data at one or more remote sites throughout a system, and it is not necessarily distributed data. Contrast with **data distribution**. See also **disk replication** and **transaction replication**.
data server	A server that provides the functionality necessary to maintain the physical representation of a table in a database. Data servers are usually database servers, but they can also be any data repository with the interface and functionality a data client requires. See also **client**, **client application**, and **data client**.
database	A collection of data with a specific structure (or schema) for accepting, storing, and providing data for users. See also **data server**, **DBMS**, and **RDBMS**.
database connection	A connection that allows Replication Server to manage the database and distribute transactions to the database. Each database in a replication system can have only one database connection in Replication Server. See also **Replication Server** and **route**.

datatype   A keyword that identifies the characteristics of stored information on a computer. Some common datatypes are: char, int, smallint, date, time, numeric, and float. Different data servers support different datatypes.

DBMS   An abbreviation for *database management system*, a computer-based system for defining, creating, manipulating, controlling, managing, and using databases. The DBMS can include the user interface for using the database, or it can be a stand-alone data server system. Compare with **RDBMS**.

disaster recovery   A method or process used to restore the critical business functions interrupted by a catastrophic event. A disaster recovery (or business continuity) plan defines the resources and procedures required for an organization to recover from a disaster, based on specified recovery objectives.

ERSSD   An abbreviation for embedded *Replication Server System Database*, which manages replication system information for a Replication Server. See also **Replication Server**.

failback   A procedure that restores the normal user and client access to a primary database, after a failover procedure switched access from the primary database to a standby database. See also **failover**.

failover   A procedure that switches user and client access from a primary database to a standby database, particularly in the event of a failure that interrupts operations at the primary database, or access to the primary database. Failover is an important fault-tolerance feature for systems that require high availability. See also **failback**.

function   A Replication Server object that represents a data server operation such as insert, delete, or begin transaction. Replication Server distributes operations to standby databases as functions. See also **function string**.

function string   A string that Replication Server uses to map a function and its parameters to a data server API. Function strings allow Replication Server to support heterogeneous replication, in which the primary and standby databases are different types, with different SQL extensions and different command features. See also **function**.

gateway   Connectivity software that allows two or more computer systems with different network architectures to communicate.

inbound queue   A stable queue managed by Replication Server to spool messages received from a Mirror Replication Agent. See also **outbound queue** and **stable queue**.

interfaces file	A file containing information that Sybase Open Client and Open Server applications need to establish connections to other Open Client and Open Server applications. See also **Open Client** and **Open Server**.
isql	An interactive SQL client application that can connect and communicate with any Sybase Open Server application, including Adaptive Server, Mirror Replication Agent, and Replication Server. See also **Open Client** and **Open Server**.
Java	An object-oriented programming language developed by Sun Microsystems. A platform-independent, "write once, run anywhere" programming language.
Java VM	The Java Virtual Machine. The Java VM (or JVM) is the part of the Java Runtime Environment (JRE) that is responsible for interpreting Java byte codes. See also **Java** and **JRE**.
JDBC	An abbreviation for *Java Database Connectivity*. JDBC is the standard communication protocol for connectivity between Java clients and data servers. See also **data server** and **Java**.
JRE	An abbreviation for *Java Runtime Environment*. The JRE consists of the Java Virtual Machine (Java VM or JVM), the Java Core Classes, and supporting files. The JRE must be installed on a machine to run Java applications, such as the Mirror Replication Agent. See also **Java VM**.
LAN	An abbreviation for "local area network," a computer network located on the user's premises that covers a limited geographical area (usually a single site). Communication within a local area network is not subject to external regulations; however, communication across the LAN boundary can be subject to some form of regulation. Contrast with **WAN**.
latency	In transaction replication, the time it takes to replicate a transaction from a primary database to a standby database. Specifically, latency is the time elapsed between committing an original transaction in the primary database and committing the replicated transaction in the standby database.
	In disk replication, latency is the time elapsed between a disk write operation that changes a block or page on a primary device and the disk write operation that changes the replicated block or page on a mirror (or standby) device.
	See also **disk replication** and **transaction replication**.
LOB	An abbreviation for *large object*, a type of data element that is associated with a column that contains extremely large quantities of data.

Log Reader	An internal component of the Mirror Replication Agent that interacts with the primary database and mirror log devices to capture transactions for replication. See also **Log Transfer Interface** and **Log Transfer Manager**.
Log Transfer Interface	An internal component of the Mirror Replication Agent that interacts with Replication Server to forward transactions for distribution to a standby database. See also **Log Reader** and **Log Transfer Manager**.
Log Transfer Manager	An internal component of the Mirror Replication Agent that interacts with the other Mirror Replication Agent internal components to control and coordinate Mirror Replication Agent operations. See also **Log Reader** and **Log Transfer Interface**.
Maintenance User	A special user login name in the standby database that Replication Server uses to apply replicated transactions to the database. See also **Replication Server**.
materialization	The process of copying the data from a primary database to a standby database, initializing the standby database so that the Mirror Replication Agent system can begin replicating transactions. See also **atomic materialization**, **bulk materialization**, and **non-atomic materialization**.
Mirror Activator	Mirror Activator is a Sybase software solution that allows you to combine the benefits of transaction replication and disk replication, thereby eliminating the disadvantages of using either system alone in a disaster recovery solution.
Mirror Replication Agent	An application that reads a primary database transaction log to acquire information about data-changing transactions in the primary database, processes the log information, and then sends it to a Replication Server for distribution to a standby database. See also **primary database** and **Replication Server**.
nonatomic materialization	A materialization method that copies subscription data without a lock on the primary database. Changes to primary data are allowed during data transfer, which may cause temporary inconsistencies between the primary and standby databases. Contrast with **atomic materialization**. See also **bulk materialization**.
ODBC	An abbreviation for *Open Database Connectivity*, an industry standard communication protocol for clients connecting to data servers. See also **JDBC**.
Open Client	A Sybase product that provides customer applications, third-party products, and other Sybase products with the interfaces needed to communicate with Open Server applications. See also **Open Server**.
Open Client application	An application that uses Sybase Open Client libraries to implement Open Client communication protocols. See also **Open Client** and **Open Server**.

Open Server	A Sybase product that provides the tools and interfaces required to create a custom server. See also **Open Client**.
Open Server application	A server application that uses Sybase Open Server libraries to implement Open Server communication protocols. See also **Open Client** and **Open Server**.
outbound queue	A stable queue managed by Replication Server to spool messages to a standby database. See also **inbound queue** and **stable queue**.
primary data	The version of a set of data that is the source used for replication. Primary data is stored and managed by the primary database. See also **Mirror Replication Agent**, **primary database**, and **Replication Server**.
primary database	The database that contains the data to be replicated to another database (the standby database) through a replication system. The primary database is the database that is the source of replicated data in a replication system. Sometimes called the *active database*. Contrast with **standby database**. See also **primary data**.
primary key	The column or columns whose data uniquely identify each row in a table.
primary site	The location or facility at which primary data servers and primary databases are deployed to support normal business operations. Sometimes called the *active site* or *main site*. See also **primary database** and **standby site**.
primary table	A table used as a source for replication. Primary tables are defined in the primary database schema. See also **primary data** and **primary database**.
primary transaction	A transaction that is committed in the primary database and recorded in the primary database transaction log. See also **primary database**, **replicated transaction**, and **transaction log**.
quiesce	To cause a system to go into a state in which further data changes are not allowed. See also **quiescent**.
quiescent	In a replication system, a state in which all updates have been propagated to their destinations. Some Mirror Replication Agent and Replication Server commands require that you first quiesce the replication system.
	In a database, a state in which all data updates are suspended so that transactions cannot change any data and the data and log devices are stable.
	This term is interchangeable with *quiesced* and *in quiesce*. See also **quiesce**.
RASD	An abbreviation for *Mirror Replication Agent System Database*. Information in the RASD is used by the primary database to recognize database structure or schema objects in the transaction log.

RCL	An abbreviation for *Replication Command Language*, the command language used to manage Replication Server.
RDBMS	An abbreviation for *relational database management system*, an application that manages and controls relational databases. Compare with **DBMS**. See also **relational database**.
relational database	A collection of data in which data is viewed as being stored in tables, which consist of columns (data items) and rows (units of information). Relational databases can be accessed by SQL requests. See also **SQL**.
replicated data	A set of data that is replicated from a primary database to a standby database by a replication system. See also **primary database**, **replication system**, and **standby database**.
replicated transaction	A primary transaction that is replicated from a primary database to a standby database by a transaction replication system. See also **primary database**, **primary transaction**, **standby database**, and **transaction replication**.
replication definition	A description of a table or stored procedure in a primary database, for which subscriptions can be created. The replication definition, maintained by Replication Server, includes information about the columns to be replicated and the location of the primary table or stored procedure. See also **Replication Server** and **subscription**.
Replication Server	The Sybase software product that provides the infrastructure for a robust transaction replication system. See also **Mirror Replication Agent**.
RSSD	An abbreviation for *Replication Server System Database*, which manages replication system information for a Replication Server. See also **Replication Server**.
replication system	A data processing system that replicates data from one location to another. Data can be replicated between separate systems at a single site, or from one or more local systems to one or more remote systems. See also **disk replication** and **transaction replication**.
rollback	An instruction to a database to back out of the changes requested in a unit of work (called a transaction). Contrast with **commit**. See also **transaction**.
SQL	An abbreviation for *Structured Query Language*, a non-procedural programming language used to process data in a relational database. ANSI SQL is an industry standard. See also **transaction**.

stable queue	A disk device-based, store-and-forward queue managed by Replication Server. Messages written into the stable queue remain there until they can be delivered to the appropriate process or standby database. Replication Server provides a stable queue for both incoming messages (the inbound queue) and outgoing messages (the outbound queue). See also **database connection**, **Replication Server**, and **route**.
standby data	The data managed by a standby database, which is the destination (or target) of a replication system. See also **data replication** and **standby database**.
standby database	A database that contains data replicated from another database (the primary database) through a replication system. The standby database is the database that receives replicated data in a replication system. Sometimes called the *replicate database*. Contrast with **primary database**. See also **standby data**.
standby site	The location or facility at which standby data servers and standby databases are deployed to support disaster recovery, and normal business operations during scheduled downtime at the primary site. Sometimes called the *alternate site* or *replicate site*. Contrast with **primary site**. See also **standby database**.
subscription	A request for Replication Server to maintain a replicated copy of a table, or a set of rows from a table, in a standby database at a specified location. See also **replication definition** and **Replication Server**.
table	In a relational DBMS, a two-dimensional array of data or a named data object that contains a specific number of unordered rows composed of a group of columns that are specific for the table. See also **database**.
transaction	A unit of work in a database that can include zero, one, or many operations (including insert, update, and delete operations), and that is either applied or rejected as a whole. Each SQL statement that modifies data can be treated as a separate transaction, if the database is so configured. See also **SQL**.
transaction log	Generally, the log of transactions that affect the data managed by a data server. Mirror Replication Agent reads the transaction log to identify and acquire the transactions to be replicated from the primary database. See also **Mirror Replication Agent**, **primary database**, and **Replication Server**.
transaction replication	A data replication method that copies data-changing operations from a primary database transaction log to a standby database. See also **data replication** and **disk replication**.

transactional consistency	A condition in which all transactions in the primary database are applied in the standby database, in the same order that they were applied in the primary database.
WAN	An abbreviation for "wide area network," a system of local-area networks (LANs) connected together with data communication lines. Contrast with **LAN**.

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