

SYBASE®

Installation Guide

Replication Agent™

15.5

[Linux, Microsoft Windows, and UNIX]

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About This Book

This book describes how to install Replication Agent™ on Linux, Microsoft Windows, 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 Replication Agent software from the Replication Agent distribution media. Use the Installation and Setup worksheet in Chapter 1 to gather and record the connectivity and configuration information you need to set up the Replication Agent.

See the *Replication Agent Administration Guide* for:

- An introduction to the Replication Agent system, and an overview of its topology
- Specific configuration requirements for each Replication Agent system component

This book provides the following information:

- Chapter 1, “Preparing for Installation,” describes basic Replication Agent system requirements, and provides a worksheet to help you gather and record the configuration information that you need to install the Sybase® Replication Agent software and set up the Sybase Replication Agent system.
- Chapter 2, “Installing Replication Agent,” describes how to install the Replication Agent software on a Linux, Microsoft Windows, or UNIX platform. This chapter also describes how to uninstall the software.

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

Related documents

Replication Agent Refer to the following documents to learn more about the Sybase Replication Agent:

- *Replication Agent Reference Manual* – for information about all Replication Agent commands and configuration parameters, including syntax, examples, and detailed command usage notes
- *Replication Agent Primary Database Guide* – for detailed, database-specific information about each non-Sybase database that is supported by the Replication Agent
- *Replication Agent Administration Guide* – for an introduction to the Sybase Replication Agent system, and information about setting up and administering the Replication Agent and other components of the Sybase Replication Agent system
- *The Replication Agent Release Bulletin* – for last-minute information that was too late to be included in the books

Note A more recent version of the *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 Product Manuals Web site.

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

- *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

Primary data server Make sure that you have appropriate documentation for the non-Sybase primary data server that you use with the Sybase replication system.

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

- The Sybase 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.

Other sources of information

Use the Sybase Getting Started 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 other documents or updated information. 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.

You can also access the documents available on the Getting Started CD from the Sybase Product Manuals Web site.

- The Sybase Product Manuals Web site, which can be accessed using a standard Web browser, includes the Replication Server documents that are not included in the Getting Started CD. 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.

❖ Finding the latest information on product certifications

- 1 Point your Web browser to Technical Documents at <http://www.sybase.com/support/techdocs/>.
- 2 Click Partner Certification Report.
- 3 In the Partner Certification Report filter select a product, platform, and timeframe and then click Go.
- 4 Click a Partner Certification Report title to display the report.

❖ Finding 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.

Sybase EBFs and software maintenance

❖ **Creating 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.

❖ **Finding 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_xlog
```

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

If you specify the value option, it changes the setting of the specified configuration parameter.

- In a sample screen display, variables or words that you should replace with the appropriate value for your site appear like this:

```
resume connection to rds.rdb
```

...where *rds* and *rdb* are the variables you should replace.

- In the regular text of this document, names of programs, utilities, procedures, and commands appear like this:
Use the `pdb_init` command to initialize the primary database.
- In the regular text of this document, names of database objects (tables, columns, stored procedures, and so on) 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:
Installer log files can be found in the `$$SYBASE/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, Replication Agent command names are *not* case-sensitive. For example, PDB_XLOG, Pdb_Xlog, and pdb_xlog 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 Replication Agent commands. However, use a mixed-case object name in a command (to match a mixed-case object name in the database), 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.

Replication Agent 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.

For a section 508 compliance statement for Replication Agent, go to the Voluntary Product Assessment Template at http://www.sybase.com/detail_list?id=52484

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.

Preparing for Installation

This chapter describes the Replication Agent system requirements, and other information you need to know *before* you install the Sybase Replication Agent version 15.5 software.

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

Topic	Page
Reviewing installation requirements	1
Reviewing the installation process	9
Completing the Installation and Setup worksheet	12
Installation and Setup worksheet	21

Note Read the *Replication Agent 15.5 Release Bulletin*, which may contain more up-to-date information.

Reviewing installation requirements

Before you install the Replication Agent 15.5 software, review the:

- SySAM requirements
- System requirements
- Installation program requirements

- Team skill requirements

Note If you are upgrading or downgrading your Replication Agent, see the *Replication Agent Primary Database Guide* for database-specific details on migration.

SySAM requirements

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

Sybase Software Asset Management 2 (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

Before you install Replication Agent, you must decide whether to configure an unserved license or a network license server. This information will be requested during installation. For detailed instructions, see the *Sybase Software Asset Management 2 Users Guide*.

SySAM verifies that a valid license exists for one of the following Sybase Replication Agents:

- Replication Agent for Oracle
- Replication Agent for Microsoft SQL Server
- Replication Agent for IBM DB2 UDB

The basic components of SySAM are:

- A license file
- The SySAM software, which consists of SySAM Utilities and SySAM Server

SySAM utilities are installed whenever you install Replication Agent. SySAM Server, however, is automatically installed with Replication Agent only if:

- The current machine does not contain a running SySAM server, and
- You installed Replication Agent with a valid served license and this served license references the installation machine as the SySAM server.

For all information about SySAM, see the *Sybase Software Asset Management 2 Users Guide*.

System requirements

This section describes the system requirements for:

- Database servers
- Java Runtime Environment (JRE)
- Platforms and operating systems
- Memory, disk space, and media device
- Accommodating the RASD
- JDBC driver

Database servers

Replication Agent supports the following database servers on Linux, Microsoft Windows, and UNIX platforms:

- Oracle
- Microsoft SQL Server database with Replication Agent running *only* on Microsoft Windows
- IBM DB2 Universal Database

The following are installation requirements for the databases:

- Replication Agent for Oracle must be installed on a UNIX or Microsoft Windows host from which it can directly access the primary Oracle redo logs.
- Replication Agent for Microsoft SQL Server must be installed on a Microsoft Windows host from which it can directly access the primary Microsoft SQL Server transaction logs.

- Replication Agent for IBM DB2 Universal Database (UDB) must be installed on the same UNIX or Microsoft Windows host as the UDB server or the UDB Administration Client.

Note The database server versions that are required and supported by Replication Agent are listed in the *Replication Agent 15.5 Release Bulletin*.

Java Runtime Environment (JRE)

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

Operating system patch levels must be current to support Java 6. 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 Sun Microsystems Web site at <http://java.sun.com/j2se>
- For information about JREs on the AIX platforms, see the AIX platforms at <http://www.ibm.com/developerworks/java/jdk/aix/service.html>
- For information about JREs on the HP-UX platforms, see the HP-UX platforms at <http://www.hp.com/products1/unix/java>

Platforms and operating systems

Replication Agent 15.5 requires one of the platforms and operating system versions listed in Table 1-1.

Table 1-1: Platform and operating system requirements

Platform	Operating system version
HP-UX Itanium ^a	HP-UX 11.31 (64-bit only)
IBM RISC System/6000 ^a	IBM AIX 5.3, 6.1 (64-bit only)
Linux/Intel ^a	Linux x86 and x64 ^b : <ul style="list-style-type: none"> • Red Hat Enterprise Linux 4.4: Kernel version 2.6.9-42.EL • Red Hat Enterprise Linux 5.1: Kernel version 2.6.18-8.e15 • SuSE Linux Enterprise Server 10: Kernel version 2.6.16.21-0.8
Microsoft Windows	Windows x86 and x64 ^b : <ul style="list-style-type: none"> • Windows Server 2003 • Windows Server 2008 • Windows Server XP Professional • Windows Server Vista 6.0.6000
Sun Solaris (SPARC) ^a	Sun Solaris 9, 10 (64-bit only)

a. Replication Agent for Microsoft SQL Server is not supported on any UNIX or Linux platforms. It is supported only on Microsoft Windows.

b. Replication Agent binary is 32-bit word size that runs on both the 32-bit and 64-bit platforms.

Table 1-2 lists the references for Java-related patches for Solaris, HP-UX, and AIX. Ensure that the required patches are installed before you install Replication Agent.

Table 1-2: Operating system patch requirements

Platform	Reference
HP-UX Itanium	HP-UX Java patch information page at http://docs.hp.com/en/HPUXJAVAPATCHES/index.html
IBM AIX	AIX download and service information page at http://www.ibm.com/developerworks/java/jdk/aix/service.html
Sun Solaris (SPARC)	Java SE downloads page at http://java.sun.com/javase/downloads/index.jsp

Memory, disk space, and media device

Table 1-3 lists the minimum physical memory, storage, and media device requirements on the Replication Agent host machine. Your Replication Agent configuration may require more memory and disk space than the minimum listed in Table 1-3.

Table 1-3: Memory, disk space, and media device requirements

Memory	512MB RAM
Disk space	<p>The exact disk space needed to install Replication Agent is reflected by the installation program and is dependent on the components that are installed with Replication Agent. Installing Replication Agent, SySAM Utilities and SySAM Server requires:</p> <ul style="list-style-type: none"> • HP-UX: 740MB • IBM AIX: 480MB • Linux: 390MB • Microsoft Windows: 360MB • Sun Solaris: 390MB
Temporary disk space	<p>The installation program uses the <i>/tmp</i> directory to uncompress files used during the installation, such as JRE, and the SySAM and Replication Agent components. Installing Replication Agent requires the following temporary space:</p> <ul style="list-style-type: none"> • HP-UX: 900MB • IBM AIX: 680MB • Linux: 650MB • Microsoft Windows: 530MB • Sun Solaris: 720MB
Media Device	CD drive

Accommodating the RASD

Note This section applies only to Replication Agent for Oracle and Replication Agent for Microsoft SQL Server.

Each Replication Agent for Oracle or Replication Agent for Microsoft SQL Server instance uses an embedded SQL Anywhere® database to manage its 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 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 Replication Agent shuts down and suspends replication. To prevent this, provide adequate disk space on the Replication Agent host machine to accommodate the initial size of the RASD, as well as some potential growth.

For more information about the RASD, see the *Replication Agent Administration Guide*.

JDBC driver

The JDBC™ drivers that are required and supported by Replication Agent are listed in the *Replication Agent 15.5 Release Bulletin*.

Installation program requirements

This section describes the installation program requirements.

GUI and console mode installation

The standard installation procedure for Replication Agent uses the installation program wizard in GUI mode (the GUI wizard).

Use the installation program GUI wizard to install 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 Replication Agent host. Before you start the installation program wizard, verify that the remote machine is configured to provide a GUI environment for the server on which the Replication Agent software will be installed.

Note You can use the installation program wizard in console mode to install Replication Agent from an operating system command prompt, without a GUI environment. See “Installing in console mode” on page 43.

Home directory access

When installing on a UNIX platform, the Replication Agent 15.5 installation program requires write access to your home directory.

Visual C++ 2005 runtime components

When installing on a Microsoft Windows platform, the Replication Agent 15.5 installation program requires components of the Microsoft Visual C++ 2005 libraries. To check if the Microsoft Visual C++ 2005 Redistributable Package is already installed, go to Start | Control Panel | Add or Remove Programs and look for Microsoft Visual C++ 2005 Redistributable. When Microsoft Visual C++ 2005 libraries are not installed, the Sybase installer hangs without a warning or an error message.

You can download Visual C++ 2005 from the Microsoft Visual C++ 2005 SP1 Redistributable Package (x86) page at <http://www.microsoft.com/downloads/details.aspx?FamilyID=200B2FD9-AE1A-4A14-984D-389C36F85647&displayLang=en>. Run *vcredist_x86.exe* to install the Visual C++ runtime components on Microsoft Windows 32-bit or 64-bit machines.

Team skill requirements

To successfully install and configure a replication environment using Replication Agent, you need team members with specific skills. For your site, identify the person or team responsible for each skill set listed in Table 1-4.

Table 1-4: Replication Agent installation skill requirements

Role	Skill set
operating system administrator	<ul style="list-style-type: none"> • Understanding of Linux, Sun Solaris, HP-UX, AIX, or Microsoft Windows operating system • Knowledge of standards and conventions at the installation site
communications administrator	<ul style="list-style-type: none"> • Understanding of connectivity and communication protocols, such as TCP/IP, used at your site • Understanding of your site's network configuration • Ability to design, establish, test, and troubleshoot remote communications between the primary database, Replication Agent, and Replication Server
Replication Server administrator	<ul style="list-style-type: none"> • Understanding of Replication Server and the replication system environment • Replication Server administrator privileges
Enterprise Connect™ Data Access (ECDA) administrator	<ul style="list-style-type: none"> • Understanding of ECDA and applying data to non-Sybase databases • ECDA administrator privileges
primary database administrator	<ul style="list-style-type: none"> • Understanding of the primary database • Primary database administrator privileges

Reviewing the installation process

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

Table 1-5 lists the major steps required to set up a replication system to replicate transactions from a non-Sybase primary database in an enterprise network. To install and configure a sample replication system, see the *Replication Server Options Quick Start Guide*.

Table 1-5: Setting up a Sybase replication system

Step	To do this	Refer to
1	<p><i>Install the primary data server.</i></p> <p>The primary data server is the source of transactions to be replicated.</p>	<ul style="list-style-type: none"> • Primary data server documentation • Vendor documentation or Web site for the primary data server
2	<p><i>Install the connectivity drivers for the primary database server.</i></p> <p>Install the correct JDBC driver for your primary database server.</p>	<ul style="list-style-type: none"> • “Setting up connectivity to the primary database” on page 35 • Vendor documentation or Web site for the primary data server
3	<p><i>Install Replication Server and create connections.</i></p> <p>This includes:</p> <ul style="list-style-type: none"> • Designing the replication system • Installing Replication Server • Defining connections from Replication Server to the ERSSD and routes between Replication Servers • Defining connections using ECDA when replicating to a non-Sybase database 	<ul style="list-style-type: none"> • Replication Server documentation • ECDA documentation
4	<p><i>Prepare to install Replication Agent.</i></p> <ul style="list-style-type: none"> • Review installation requirements and the installation procedure for Replication Agent. • Complete the “Installation and Setup worksheet” on page 21. 	<ul style="list-style-type: none"> • Chapter 1, “Preparing for Installation,” in this book and Chapter 2, “Setting Up and Configuring Replication Agent,” in the <i>Replication Agent Administration Guide</i> • <i>Replication Agent Release Bulletin</i>

Step	To do this	Refer to
5	<p><i>Install the Replication Agent software.</i></p> <p>When installing the software:</p> <ul style="list-style-type: none"> • For Oracle, Replication Agent for Oracle must be installed on a UNIX or Microsoft Windows host from which it can directly access the primary Oracle redo logs. • For Microsoft SQL Server, Replication Agent for Microsoft SQL Server must be installed on a Microsoft Windows host from which it can directly access the primary Microsoft SQL Server transaction logs. • For UDB, Replication Agent for UDB must be installed on the same UNIX or Microsoft Windows host as the DB2 UDB server or a DB2 UDB client. 	<p>“Installing the Replication Agent software” on page 39</p>
6	<p><i>Configure Replication Server and primary data server connections.</i></p> <p>This includes:</p> <ul style="list-style-type: none"> • Creating a Replication Server database connection to the primary data server • Creating a Replication Server login for the Replication Agent instance • Configuring Replication Agent parameters • Testing connections between the Replication Agent and the primary Replication Server, and between the Replication Agent and the primary data server 	<p><i>Replication Agent Administration Guide</i>, Chapter 3, “Administering Replication Agent”</p>
7	<p><i>Set up the Replication Agent instance.</i></p> <p>This includes:</p> <ul style="list-style-type: none"> • Creating the Replication Agent transaction log objects • Marking primary objects for replication 	<p><i>Replication Agent Administration Guide</i>, Chapter 2, “Setting Up and Configuring Replication Agent”</p>
8	<p><i>Prepare for replication.</i></p> <p>Refer to the checklist to verify that all the replication system components are in place before you start replication.</p>	<p><i>Replication Agent Administration Guide</i>, Chapter 2, “Setting Up and Configuring Replication Agent”</p>

Step	To do this	Refer to
9	<p>Verify your replication system using <i>Replication Agent test scripts (optional)</i>.</p> <p>Use the test scripts provided with Replication Agent to set up a test environment and verify replication from a primary database to a replicate database.</p>	<p><i>Replication Agent Primary Database Guide</i>, the chapter for your primary data server</p>
10	<p><i>Materialize subscriptions to primary data.</i></p> <p>For each subscription, this process:</p> <ul style="list-style-type: none"> Validates and activates the subscription Populates tables in the replicate database so they are synchronized with the primary database before you start replication 	<ul style="list-style-type: none"> Replication Server documentation <i>Replication Agent Administration Guide</i>, Appendix A, “Materializing Subscriptions to Primary Data”
11	<p><i>Start replication.</i></p> <p>Put the Replication Agent instance in the <i>Replicating</i> state.</p>	<p><i>Replication Agent Administration Guide</i>, Chapter 2, “Setting Up and Configuring Replication Agent”</p>

Completing the Installation and Setup worksheet

The “Installation and Setup worksheet” on page 21 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 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 Replication Agent.

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

Section 1: Replication Agent administration information

Determine and record the Replication Agent administration information and record it in Section 1 of the worksheet.

❖ Completing Section 1 of the Installation and Setup worksheet

- 1 Determine the instance type of the Replication Agent. This instance type indicates which primary database server the Replication Agent will work with.

Instance types are:

- oracle – Oracle Database Server (Replication Agent for Oracle must be installed on a UNIX or Microsoft Windows host from which it can directly access the primary Oracle redo logs.)
- mssql – Microsoft SQL Server (Replication Agent for Microsoft SQL Server must be installed on a Microsoft Windows host from which it can directly access the primary Microsoft SQL Server transaction logs.)
- ibmudb – IBM DB2 Universal Database (UDB) (Replication Agent for UDB must be installed on the same UNIX or Microsoft Windows host as the DB2 UDB server or a DB2 UDB client.)

Record the instance type as item 1a in Section 1: Replication Agent administration information on the “Installation and Setup worksheet.”

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

Record the name of the instance as item 1b in Section 1: Replication Agent administration information on the “Installation and Setup worksheet.”

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

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

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

Record the port number as item 1c in Section 1: Replication Agent administration information on the “Installation and Setup worksheet.”

Note Replication Agent for Oracle and Replication Agent for Microsoft SQL Server each require two port numbers. The additional one is for the RASD. By default, Replication Agent assigns the RASD port—*admin port + 1*. This number must also be unique on the Replication Agent host machine. For more information, see “Accommodating the RASD” on page 6.

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

Use this item only if you plan to use the *isql* or *jsql* utility or Replication Manager (RM) to administer the Replication Agent instance.

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

Record the interfaces file location as item 1d in Section 1: Replication Agent administration information on the “Installation and Setup worksheet.”

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

For more information, see the *Replication Agent Administration Guide*.

Record the administrative user ID as item 1e (*admin_user*) and the password as item 1f (*admin_pw*) in Section 1: Replication Agent administration information on the “Installation and Setup worksheet.”

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.

For more information about using the create connection command, see the *Replication Server Administration Guide*.

❖ Completing 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.
 - Replication Server connects to the primary database through the Replication Agent instance, so the data server name can be the name of the Replication Agent instance.
 - The database name can be any name that helps you identify the connection Replication Server uses to communicate with the primary database.

Record the instance name or data server name as item 2a (rs_source_ds) and the database name as item 2b (rs_source_db) in Section 2: Replication Server parameter values for the primary database connection on the “Installation and Setup worksheet.”

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 cannot 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) in Section 2: Replication Server parameter values for the primary database connection on the “Installation and Setup worksheet.”

Section 3: Replication Agent parameter values for Replication Server

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

For more information about using the `ra_config` command for the initial configuration of the Replication Agent parameters, see the *Replication Agent Administration Guide*.

❖ **Completing Section 3 of the Installation and Setup worksheet**

- 1 Identify the name of the primary Replication Server host machine.
Record the Replication Server host machine name as item 3a (rs_host_name) in Section 3: Replication Agent parameter values for Replication Server on the “Installation and Setup worksheet.”
- 2 Identify the port number of the client socket port for Replication Server.
This is the port number 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) in Section 3: Replication Agent parameter values for Replication Server on the “Installation and Setup worksheet.”

- 3 Identify the user name and password 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 permissions, see the *Replication Server Reference Manual*.
If you are not the System Administrator for the system on which you are installing the 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) in Section 3: Replication Agent parameter values for Replication Server on the “Installation and Setup worksheet.”
- 4 Identify the Replication Server character set.

Note Perform this step only if you are using Replication Server 15.0 or earlier. For Replication Server 15.0.1 or later, Replication Agent directly queries the Replication Server property RS_charset.

The RS_charset property identifies the Replication Server character set and is defined in the Replication Server configuration file. The configuration file is located at:

`§SYBASE/RSfolder/install/rssrvname.cfg`

where:

- `$SYBASE` is the installation directory of the Replication Server software.
- `RSfolder` is the Replication Server folder. For example, `REP-15_0`.
- `rssrvname` is the name of the Replication Server instance.

Record the Replication Server character set as item 3e (`rs_charset`) in Section 3: Replication Agent parameter values for Replication Server on the “Installation and Setup worksheet.”

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

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

Note 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.”

❖ Completing 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`) in Section 4: Replication Agent parameter values for the RSSD on the “Installation and Setup worksheet.”

- 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`) in Section 4: Replication Agent parameter values for the RSSD on the “Installation and Setup worksheet.”

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

Record the RSSD database name as item 4c (`rssd_database_name`) in Section 4: Replication Agent parameter values for the RSSD on the “Installation and Setup worksheet.”

- 4 Identify the user ID and password 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*) in Section 4: Replication Agent parameter values for the RSSD on the “Installation and Setup worksheet.”

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

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

❖ Completing Section 5 of the Installation and Setup worksheet

- 1 If your primary database type is Oracle, identify the *tnsnames.ora* file name that contains the connection property to the primary database and connection name for the primary data server.

Record the *tnsnames.ora* file name as item 5a (*pds_tns_filename*) and record the connection name as item 5b (*pds_tns_connection*) in Section 5: Replication Agent parameter values for the primary data server on the “Installation and Setup worksheet.”

- 2 If you are using Oracle Automatic Storage Management (ASM), identify the *tnsnames.ora* file name that contains the connection property for the ASM database. If it is the same *tnsnames.ora* file as configured in *pds_tns_filename*, you may leave *asm_tns_filename* not set. Also identify the name of the ASM data server, ASM connection, ASM username, and ASM password.

Record the *tnsnames.ora* file name as item 5c (*asm_tns_filename*), the ASM connection name as item 5d (*asm_tns_connection*), the ASM username as item 5e (*asm_username*), and the ASM password as item 5f (*asm_password*) in Section 5: Replication Agent parameter values for the primary data server on “Installation and Setup worksheet.”

Note The *asm_tns_filename* is required only if the *pds_tns_filename* does not already have the ASM connection information.

- 3 If your primary database type is Microsoft SQL Server, 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 5g (pds_port_number) in Section 5: Replication Agent parameter values for the primary data server on the “Installation and Setup worksheet.”

- 4 If your primary database type is Microsoft SQL Server, identify the name of the primary database server.

Record the primary database server name as item 5h (pds_server_name) in Section 5: Replication Agent parameter values for the primary data server on the “Installation and Setup worksheet.”

- 5 Identify the name of the primary database on the primary data server.

The value of the pds_database_name parameter 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 Microsoft Windows, or \$ORACLE_SID on UNIX).

Record the database name as item 5i (pds_database_name) in Section 5: Replication Agent parameter values for the primary data server on the “Installation and Setup worksheet.”

- 6 If your primary database server is DB2 Universal Database, identify the data source name (DSN) configured in the ODBC driver or the catalogued database alias for the primary database. The value of the data source name parameter (pds_datasource_name) must be the DB2 database alias that identifies the primary database.

Record the appropriate value for the data source name (DSN) as item 5j (pds_datasource_name) in Section 5: Replication Agent parameter values for the primary data server on the “Installation and Setup worksheet.”

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

Note This user ID cannot 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 *Replication Agent Primary Database Guide* for more information.

Record this primary data server user ID as item 5k (pds_username) and the password as item 5l (pds_password) in Section 5: Replication Agent parameter values for the primary data server on the “Installation and Setup worksheet.”

- 8 Identify the character set of the primary database and determine the Java-equivalent character set.

For a list of valid Java character sets, see Character Encodings for J2SE 5.0 on the Java internationalization page at <http://java.sun.com/javase/technologies/core/basic/intl/>.

Record the name of the equivalent Java character set as item 5m in Section 5: Replication Agent parameter values for the primary data server on the “Installation and Setup worksheet.”

- 9 For Microsoft SQL Server. Identify the dedicated administration port number (pds_dac_port_number). For more information, see the *Replication Agent Primary Database Guide*.

Record the DAC port number as item 5n in Section 5: Replication Agent parameter values for the primary data server on the “Installation and Setup worksheet.”

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.

❖ Completing 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) in Section 6: Replication Server parameter values for the replicate data server on the “Installation and Setup worksheet.”

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

Record the database name as item 6b (replicate database name) in Section 6: Replication Server parameter values for the replicate data server on the “Installation and Setup worksheet.”

- 3 If you will be replicating DDL commands, determine the user ID and password that Replication Server uses to log in to the replicate database to apply DDL commands. This user ID cannot be the same as the Replication Server maintenance user defined in the replicate connection.

Record the DDL user name as item 6c (ddl_username) and the DDL password as item 6d (ddl_password) in Section 6: Replication Server parameter values for the replicate data server on the “Installation and Setup worksheet.”

Installation and Setup worksheet

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

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

Section 1: Replication Agent administration information

Item	Description	Example value	Your value
1a	Replication Agent instance type This identifies the type of primary database the Replication Agent instance works with.	oracle	
1b	Replication Agent instance name This name must be unique among all Replication Agent instances.	ra_sales_instance	

Item	Description	Example value	Your value
1c	<p>admin_port</p> <p>This is the client socket port number for the Replication Agent administration port.</p> <hr/> <p>Note Check with your System Administrator to determine which port numbers are available.</p> <hr/> <p>The port number must be unique (not used by any other application on the Replication Agent host machine). Check with your System Administrator to determine which port numbers are available.</p> <hr/> <p>Note Replication Agent for Oracle and Replication Agent for Microsoft SQL Server each require two port numbers. The additional one is for the RASD. By default, Replication Agent assigns the RASD port—<i>admin port + 1</i>. This number must also be unique.</p> <hr/>	10000	
1d	<p>Location of the <i>interfaces</i> file.</p> <p>Use this item only if you plan to use the isql utility or Replication Manager to administer the Replication Agent instance.</p>	<ul style="list-style-type: none"> • On UNIX: <i>\$\$YBASE/interfaces</i> • On Microsoft Windows: <i>%SYBASE%\ini\sql.ini</i> 	
1e	<p>admin_user</p> <p>This is the administrative user ID you use to log in to the Replication Agent instance.</p> <p>The default value is sa.</p>	admin_user	
1f	<p>admin_pw</p> <p>This is the administrative password you use to log in to the Replication Agent instance.</p> <p>The default value is an empty string ("").</p>	admin_pw	

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

Item	Description	Example value	Your value
2a	<p>rs_source_ds</p> <p>This is a data server name representing the primary data server to which Replication Server connects.</p> <p>This value is specified in the Replication Server create connection command used to create the Replication Agent connection in the primary Replication Server.</p> <hr/> <p>Note This name can be the name of the Replication Agent instance.</p>	ra_sales_instance	
2b	<p>rs_source_db</p> <p>This is a database name representing the primary database to which Replication Server connects.</p> <p>This value is specified in the Replication Server create connection command used to create the Replication Agent connection in the primary Replication Server.</p> <hr/> <p>Note This name can be any name that helps you identify this as the connection to the primary database. For example, it can be the same name as the pds_database_name.</p>	sales_db	
2c	<p>Maintenance User</p> <p>This is the Replication Server Maintenance User ID associated with the connection to the primary database.</p> <p>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.</p> <hr/> <p>Note This user ID must be valid at the primary database.</p>	maint_user	
2d	<p>Maintenance User password</p> <p>This is the Replication Server Maintenance User password associated with the connection to the primary database.</p>	maint_pwd	

Section 3: Replication Agent parameter values for Replication Server

Item	Description	Example value	Your value
3a	<p>rs_host_name</p> <p>This is the name or IP address of the Replication Server host machine.</p>	rs_host	
3b	<p>rs_port_number</p> <p>This is the port number Replication Agent uses to log in to Replication Server. Check with your System Administrator to determine which port numbers are available.</p>	1111	
3c	<p>rs_username</p> <p>This is the Replication Server client user ID that Replication Agent uses to log in to the primary Replication Server.</p> <p>This user ID must have connect source authority in the Replication Server.</p> <hr/> <p>Note The value for the rs_username parameter cannot be the same as the value for the pdb_maint_user parameter (item 2c).</p>	rauser	
3d	<p>rs_password</p> <p>This is the Replication Server client user password that Replication Agent uses.</p>	rapwd	

Item	Description	Example value	Your value
3e	<p>rs_charset</p> <hr/> <p>Note This property is referenced only if you are using Replication Server 15.0 and earlier. For Replication Server 15.0.1 and later, Replication Agent directly queries the Replication Server property RS_charset.</p> <hr/> <p>This is the character set that Replication Agent uses when creating LTL commands for Replication Server. It must match the Replication Servers character set, defined by the RS_charset property in the Replication Server configuration file. An example of a configuration file is <i>\$SYBASE/REP-15_0/instance_name/instance_name.cfg</i>, where <i>instance_name</i> is the name of the Replication Agent instance.</p> <hr/> <p>Note If you are using Replication Server 15.0 and earlier, setting this property to anything other than the character set of the primary Replication Server causes it to incorrectly perform character set conversion of the LTL commands it receives from Replication Agent. Only if this value is different from the RA_JAVA_DFLT_CHARSET value (which should match the primary databases character set) will Replication Agent perform character set conversion on the character data being replicated. Character set conversion slows performance.</p> <hr/>	<ul style="list-style-type: none"> On UNIX: iso_1 On Windows: cp850 	

Section 4: Replication Agent parameter values for the RSSD

Item	Description	Example value	Your value
4a	<p>rssd_host_name</p> <hr/> <p>This is the name of the host machine on which the RSSD of the primary Replication Server resides.</p>	rssd_host	
4b	<p>rssd_port_number</p> <hr/> <p>This is the client socket port number for the RSSD data server.</p>	1111	

Item	Description	Example value	Your value
4c	rssd_database_name This is the database name of the RSSD of the primary Replication Server.	rsdb_RSSD	
4d	rssd_username This is the RSSD client user ID that Replication Agent uses to access the RSSD of the primary Replication Server.	rssd_user	
4e	rssd_password This is the RSSD client password that Replication Agent uses.	rssd_pass	

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

Item	Description	Example value	Your value
5a	pds_tns_filename Note This value is for Oracle only. The fully-qualified file name identifying the Oracle <i>tnsnames.ora</i> file that contains connection properties for the primary Oracle data server.	/path1/tnsnames.ora	
5b	pds_tns_connection Note This value is for Oracle only. The Oracle connection name that identifies the primary database connection in the Oracle <i>tnsnames.ora</i> file	SALES_DB_CONN	

Item	Description	Example value	Your value
5c	asm_tns_filename	/path2/tnsnames.ora	
	<p>Note This value is for Oracle only.</p> <p>Identifies the Oracle <i>tnsnames.ora</i> filename where the ASM connection information is located.</p> <p>If this is the same <i>tnsnames.ora</i> file as configured in <i>pds_tns_filename</i>, you can leave this parameter unset.</p> <p>Note Set this parameter only if the redo logs of your primary Oracle are under Automatic Storage Management.</p>		
5d	asm_tns_connection	+ASM1_CONN	
	<p>Note This value is for Oracle only.</p> <p>Identifies the Oracle ASM connection name found in the <i>tnsnames.ora</i> file.</p> <p>Note Set this parameter only if the redo logs of your primary Oracle are under Automatic Storage Management.</p>		
5e	asm_username	sys as sysdba	
	<p>Note This value is for Oracle only.</p> <p>Identifies the Oracle user name to be used when connecting to the ASM server.</p> <p>Note Set this parameter only if the redo logs of your primary Oracle are under Automatic Storage Management.</p>		

Item	Description	Example value	Your value
5f	asm_password	change_on_install	
	<hr/> <p>Note This value is for Oracle only.</p> <hr/> <p>Password for Oracle ASM access for the user specified in asm_username.</p> <hr/> <p>Note Set this parameter only if the redo logs of your primary Oracle are under Automatic Storage Management.</p> <hr/>		
5g	pds_port_number	1111	
	<hr/> <p>Note This value is for Microsoft SQL Server only.</p> <hr/> <p>This is the client socket port number for the primary database gateway server.</p> <hr/>		
5h	pds_server_name	doc_23	
	<hr/> <p>Note This value is for Microsoft SQL Server only.</p> <hr/> <p>This is the name of the Microsoft SQL Server primary database server.</p> <hr/>		
5i	pds_database_name	sales_db	
	<hr/> <p>This is the name of the primary database on the primary database server.</p> <p>Replication Agent uses this value to determine which database is the primary database.</p> <hr/> <p>Note For Oracle, use the \$ORACLE_SID. For Microsoft SQL Server and for UDB, use the actual name of the primary database.</p> <hr/>		
5j	pds_datasource_name	sales_db_alias	
	<hr/> <p>Note This value is for DB2 Universal Database only.</p> <hr/> <p>This is the data source name (DSN) of the ODBC driver or the catalogued database alias for the primary database.</p> <hr/>		

Item	Description	Example value	Your value
5k	pds_username This is the user ID that Replication Agent uses to log in to the primary database.	pds_user	
5l	pds_password This is the password for pds_username.	pds_pw	
5m	This is the Java-equivalent of the primary database character set. Note Unless you want to override the default character set that the JVM finds on your system, you do <i>not</i> 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.	<ul style="list-style-type: none"> On UNIX: ISO8859_1 On Windows: Cp850 	
5n	pds_dac_port_number Note This value is for Microsoft SQL Server only. The dedicated administration connection port number that Replication Agent uses to connect to the primary database during the server-level initialization of the primary data server.	1348	

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

Item	Description	Example value	Your value
6a	Replicate host name 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.	rds_host	

Item	Description	Example value	Your value
6b	<p>Replicate database name</p> <p>This is the name of the replicate database on the replicate database server.</p> <p>You need this name when you create subscriptions. See the Replication Server documentation for more information.</p>	replicate_db	
6c	<p>ddl_username</p> <hr/> <p>Note This value is for Oracle and Microsoft SQL Server only.</p> <hr/> <p>This is the replicate database client user ID that Replication Server uses to log in to the replicate database to apply DDL commands.</p> <p>This user ID must have authority in the replicate database to create any schema or issue any DDL command replicated from the primary database.</p> <p>The Replication Agent sends this ID and password to Replication Server together with any DDL command executed at the primary database.</p> <hr/> <p>Note The value for ddl_username cannot be the same as the value of the maintenance user defined in Replication Server for the replicate connection.</p> <hr/>	scott	
6d	<p>ddl_password</p> <hr/> <p>Note This value is for Oracle and Microsoft SQL Server only.</p> <hr/> <p>This is the replicate database client user password that Replication Server uses with the value for ddl_username.</p> <hr/>	tiger	

See also

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

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

- The *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.

Installing Replication Agent

This chapter describes how to install Sybase Replication Agent on a Linux, Microsoft Windows, or UNIX platform, and how to create, configure, and start a Replication Agent instance.

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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 Replication Agent:

- Read the Replication Agent 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 Replication Agent release bulletin

Read the *Replication Agent 15.5 Release Bulletin* for current information about specific requirements of Replication Agent.

The *Replication Agent Release Bulletin* provides:

- Product information that might not be included in the Replication Agent guides, such as known issues and documentation updates.
- Additional information about installing and setting up the Replication Agent that was not available until after the software and documentation was released.

Note If you are upgrading or downgrading your Replication Agent, see the *Replication Agent Primary Database Guide* for database-specific information.

Plan for system requirements

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

Be aware of the following installation requirements:

- Replication Agent for Oracle must be installed on a UNIX or Microsoft Windows host from which it can directly access the primary Oracle redo logs.
- Replication Agent for Microsoft SQL Server must be installed on a Microsoft Windows host from which it can directly access the primary Microsoft SQL Server transaction logs.
- Replication Agent for IBM DB2 Universal Database (UDB) must be installed on the same UNIX or Microsoft Windows host as the UDB server or the UDB Administration Client.

See “System requirements” on page 3 for more information about:

- Platform and operating system requirements
- Memory, disk space, and media device requirements

See the *Replication Agent 15.5 Release Bulletin* for additional current information about system requirements.

Verify the system environment

Before you install Replication Agent, verify the following in your Sybase 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.

Complete the Installation and Setup worksheet

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

See “Completing the Installation and Setup worksheet” on page 12 for detailed instructions.

Setting up connectivity to the primary database

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 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 vendor's JDBC driver should be in the CLASSPATH. If more than one version is in the CLASSPATH, Replication Agent will have problems connecting to the primary database.

DB2 UDB client

Replication Agent for IBM DB2 Universal Database (UDB) must be installed on the same UNIX or Microsoft Windows host as the UDB server or the UDB Administration Client. Replication Agent requires access to UDB JDBC drivers and UDB API libraries.

Note The DB2 JDBC driver is effectively a JDBC/ODBC bridge. For each primary database, you must configure an ODBC data source name (DSN) in the DB2 client software.

If the Replication Agent is installed on the same host machine as the DB2 Universal Database primary data server, a separate DB2 client is not required for connectivity.

If the Replication Agent host machine is not the same as the DB2 Universal Database host, you must install the DB2 Administration Client on the Replication Agent host machine.

For information on installing the DB2 Administration Client on your Replication Agent host machine, see the IBM publication, *DB2 Universal Database and DB2 Connect, Installation and Configuration Supplement*.

❖ Setting up connectivity to a DB2 UDB server

- 1 When you install a DB2 client on a UNIX platform, you need to source *db2cshrc* to correctly set all required DB2 environment variables. On Linux and Windows only, if your DB2 installation is 64 bit, you must customize the script to point to the 32-bit client libraries. See the *Replication Agent Primary Database Guide* for more information.

Add the following to the *.login* file of the user account that starts and stops the Replication Agent instance:

```
source /path_name/sqlllib/db2cshrc
```

where *path_name* is the path where you installed the DB2 client. You must log out and log back in for this change to take effect, or issue the command `source .login` after the change.

Note When you install a DB2 client on Microsoft Windows, the installation program modifies all required environment variables automatically.

- 2 For each primary database (regardless of platform), you must configure an ODBC data source name (DSN) in the DB2 client software. Make a note of the *database name* and *datasource name* when you configure the data source.

Be sure to record the database name and datasource name in the following Replication Agent configuration parameters:

- `pds_database_name` – primary database name
- `pds_datasource_name` – cataloged database alias or the ODBC data source name for the primary database

Oracle and Microsoft SQL Server JDBC drivers

JDBC drivers for Oracle and Microsoft SQL Server databases are provided by the database vendors. If the JDBC driver for your database is not already installed, obtain the appropriate driver from the Web site of the vendor.

- For the JDBC driver for Oracle at http://technet.oracle.com/software/tech/java/sqlj_jdbc/content.html

For the JDBC driver for Microsoft SQL Server at <http://www.microsoft.com/downloads> and search for “SQL Server 2005 JDBC Driver.”

❖ Setting the CLASSPATH environment variable

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

- 2 **Note** Replication Agent for Microsoft SQL Server must be installed on Microsoft Windows.
-

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

- For UNIX: (Microsoft SQL Server is not available on UNIX)

Add the following to the *.login* file of the user account that is used to start and stop the 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 Microsoft Windows:

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

```
drive:\path_name\driver
```

where:

- *drive* is the drive letter.
- *path_name* is where you installed the JDBC driver.
- *driver* is the name of the JDBC driver:
 - For Oracle, the name is *ojdbc5.jar*
 - For Microsoft SQL Server, the name is *sqljdbc.jar*.

Click Apply, then OK.

- 3 On the Oracle host machine, the Oracle primary server must be running the Transparent Network Substrate (TNS) Listener Service. See the Oracle networking document for more information about TNS.

Installing the Replication Agent software

The Replication Agent 15.5 software is distributed on the Replication Agent 15.5 media. See the *Replication Agent Release Bulletin* for the current distribution media catalog numbers.

Note SySAM 2, the Sybase Software Asset Management license manager, is automatically installed if needed. See “SySAM requirements” on page 2.

Installation requirements for the databases include:

- Replication Agent for Oracle must be installed on a UNIX or Microsoft Windows host from which it can directly access the primary Oracle redo logs.
- Replication Agent for Microsoft SQL Server must be installed on a Microsoft Windows host machine from which it can directly access the primary Microsoft SQL Server transaction logs.
- Replication Agent for IBM DB2 Universal Database (UDB) must be installed on the same UNIX or Microsoft Windows host as the UDB server or the UDB Administration Client.

The following sections describe how to install Replication Agent on a Linux, Microsoft Windows, or UNIX platform, using the installation program:

- “Installing with the GUI wizard” on page 39
- “Installing in console mode” on page 43
- “Installing using a response file” on page 45

If you encounter problems during the installation, see “Installation troubleshooting” on page 49.

Installing with the GUI wizard

This installation procedure requires one of the following:

- A GUI environment (with a monitor, keyboard, and pointing device) on the Replication Agent host machine, or
- A remote machine configured to provide a GUI environment for the Replication Agent host machine.

❖ **Installing Replication Agent with the GUI wizard**

- 1 Log in to the Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Replication Agent instance (for example, the “sybase” user).
- 2 Close all nonessential applications, and minimize any open windows.
- 3 Insert the Replication Agent 15.5 distribution media in the appropriate drive.
- 4 Start the installation program:

- On Microsoft Windows platforms, the installation program should start automatically. If it does not, select Start | Run, and enter:

```
x:\setup.exe
```

where *x*: is your media drive.

You can also start the installation program from Microsoft Windows Explorer by double-clicking the *setup.exe* file icon.

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

```
cd /cdrom  
./setup
```

- 5 Click Next.

Note You can click Cancel to stop the installation at any point.

- 6 Select your geographic location.
- 7 Read the Sybase license agreement and select “I agree to the terms of the Sybase license for the install location specified.”

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

Click Next.

- 8 Specify an installation directory. The default installation directory is:
 - Existing `%SYBASE%` or `c:\sybase` on Microsoft Windows platforms
 - Existing `$SYBASE` or `/opt/sybase` on UNIX platforms

Click Next to accept the default installation directory, or:

- Click Choose to select an installation directory in the file browser. Click Next.
- Enter a directory name. Click Next.

If the directory name does not exist, click Yes when prompted to create it:

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

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

```
Warning: You have chosen to install into an existing  
directory. If you proceed with this installation,  
any older versions of the products you choose to  
install that are detected in this directory will be  
replaced.
```

If you continue and the older products were not installed with Replication Agent 15.5, the installation program overwrites the common files.

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 the installation program is attempting to overwrite.

9 Select the primary database the Replication Agent will connect to:

- Oracle
- Microsoft SQL Server
- UDB

Click Next.

Select one of these options to enter the license:

- Specify license keys – browse for or to directly specify the license file.
- Use previously deployed license server – use a previously deployed license server. Enter the host name of the machine where the license server is running and the port number if the port number you are using is not the default.

- Continue installation without a license key – install and use Replication Agent without a license for a grace period of 30 days. To continue using Replication Agent after the end of the grace period, obtain valid license from the Sybase Product Download Center at <http://www.sybase.com/detail?id=1025266>, and install it.

For more information on SySAM licensing, see the *Sybase Software Asset Management Users Guide*.

Click Next until you see the Sybase Software Asset Management Notification window.

- 10 On the Sybase Software Asset Management Notification window, 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 enter values for the following (from your worksheet):
 - SMTP server host name
 - SMTP server port number
 - E-mail return address
 - Recipients of the notification
 - Message severity level of an event that triggers e-mail notification. Your choices are:
 - Informational
 - Warning
 - Error

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

Click Next.

- 11 Review the product features or components listed on the Pre-Installation Summary window. Click Install.

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

If errors occur during the installation, the installation program displays error messages. Exit the installation program wizard to correct the cause of the error, then restart the installation program. See “Installation troubleshooting” on page 49.

If the software is installed successfully, you see a window confirming the successful installation.

12 Click Done to complete the installation and close the installation program.

To verify that the software components were installed correctly, see “Verifying the installation” on page 50.

Postinstallation task

Set up the SYBASE environment on the Replication Agent host machine. See “Setting up the SYBASE environment variable” on page 49.

Installing in console mode

You can install the 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 39, except that:

- You invoke the installation program wizard at the command prompt, and
- You use only the keyboard to select all of the installation options.

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

- A monitor and keyboard on the Replication Agent host machine, or
- A monitor and keyboard on a remote machine configured to control the Replication Agent host machine.

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

See “Installation program command line options” on page 53 for a list of command line options you can use with the installation program.

❖ Installing Replication Agent in console mode

- 1 Log in to the Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Replication Agent instance (for example, the “sybase” user).
- 2 Close all nonessential applications, and minimize any open windows.

- 3 Insert the Replication Agent 15.5 media in the appropriate drive.

Note On a Microsoft Windows platform, when the installation program starts automatically, click Cancel.

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

Start the installation program in console mode:

- On Microsoft Windows:

```
setupConsole.exe -i console
```

- On UNIX:

```
./setup.bin -i console
```

You see the Welcome message.

- 5 Follow the remaining wizard prompts to install the Replication Agent 15.5 software.

See “Installing with the GUI wizard” on page 39 for a description of all of the wizard prompts.

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

If errors occur during the installation, the installation program displays error messages. Exit the installation program wizard to correct the cause of the error, and then restart the installation program. See “Installation troubleshooting” on page 49.

If the software is installed successfully, you see a message confirming the successful installation.

To verify that the software components were installed correctly, see “Verifying the installation” on page 50.

Post-installation task

Set up the SYBASE environment on the Replication Agent host machine. See “Setting up the SYBASE environment variable” on page 49.

Installing using a response file

A response file contains responses to all of the installation program wizard prompts. You can install the Replication Agent 15.5 software using a response file in either console mode or silent mode.

The following 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

See “Installation program command line options” on page 53 for a list of command line options you can use with the installation program.

Creating a response file

You can create a response file, which records your responses to the installation wizard’s prompts when you install in either GUI mode or console mode. and creates a response file when the installation wizard exits. The response file is a text file that you can edit to change any responses before you use it in subsequent installations.

Note Recording responses to the installation program wizard installs the Replication Agent software and generates the response file *after* the installation is complete.

❖ Creating a response file by recording a GUI installation

- 1 Log in to the Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Replication Agent instance (for example, the “sybase” user).
- 2 Close all nonessential applications, and minimize any open windows.
- 3 Insert the Replication Agent 15.5 media in the appropriate drive.

Note On a Microsoft Windows platform, when the installation program starts automatically, click Cancel.

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

- 5 At the command prompt, invoke the installation program wizard, using the `-r` option:

- On Microsoft Windows:

```
setup.exe -r responseFileName
```

where *responseFileName* is the full path to the response file you want to create, for example, *C:\RAX\ResponseFile.txt*.

- On UNIX:

```
./setup.bin -r responseFileName
```

where *responseFileName* is the full path to the response file you want to create, for example, */home/sybase/RAX/ResponseFile.txt*.

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

See “Installing with the GUI wizard” on page 39 for a description of all of the wizard prompts.

In the event of an installation error, exit the installation program wizard to correct the cause of the error, then restart the installation program. See “Installation troubleshooting” on page 49.

❖ **Creating a response file by recording a console installation**

- 1 Log in to the Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Replication Agent instance (for example, the “sybase” user).
- 2 Close all nonessential applications, and minimize any open windows.
- 3 Insert the Replication Agent 15.5 media in the appropriate drive.

Note On Microsoft Windows, when the installation program starts automatically, click Cancel.

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

Invoke the installation program wizard at the command prompt, using the `-r` option:

- On Microsoft Windows:

```
setupConsole.exe -r responseFileName  
-i console
```


where *responseFileName* is the full path to the response file you want to create, for example, *C:\RAX\ResponseFile.txt*.

- On UNIX:

```
./setup.bin -r responseFileName -i console
```

where *responseFileName* is the full path to the response file you want to create, for example, */home/sybase/RAX/ResponseFile.txt*.

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

See “Installing with the GUI wizard” on page 39 for a description of all of the wizard prompts.

In the event of an installation error, exit the installation program wizard to correct the cause of the error, then restart the installation program. For more information, see “Installation troubleshooting” on page 49.

Installing in console mode with a response file

A console mode installation using a response file allows you to accept or change the default values provided by the response file as you move through an interactive text installation.

Invoke the installation program at the command prompt:

- On Microsoft Windows:

```
setupConsole.exe -f responseFileName -i console
```

where *responseFileName* is the full path to the response file, for example, *C:\RAX\ResponseFile.txt*.

- On UNIX:

```
./setup.bin -f responseFileName -i console
```

where *responseFileName* is the full path to the response file, for example, */home/sybase/RAX/ResponseFile.txt*.

See “Installing with the GUI wizard” on page 39 for a description of all of the wizard prompts.

In the event of an installation error, exit the installation program wizard to correct the cause of the error, then restart the installation program. For more information, see “Installation troubleshooting” on page 49.

To verify that the software components were installed correctly, see “Verifying the installation” on page 50.

Postinstallation task Set up the SYBASE environment on the Replication Agent host machine. For more information, see “Setting up the SYBASE environment variable” on page 49.

Installing in silent mode

The installation program 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, invoking the installation program from the command prompt:

- On Microsoft Windows:

```
setupConsole.exe -f responseFileName -i silent  
-DAGREE_TO_SYBASE_LICENSE=true
```

where *responseFileName* is the full path to the response file, for example, *C:\RAX\ResponseFile.txt*.

Warning! When you run a silent installation, Sybase recommends that you use *setupConsole.exe*, which runs in the foreground. *setup.exe* runs in the background, giving you the false impression that the installation has terminated immediately, without a completion status. This may result in duplicate installation attempts.

- On UNIX:

```
./setup.bin -f responseFileName -i silent  
-DAGREE_TO_SYBASE_LICENSE=true
```

where *responseFileName* is the full path to the response file, for example, */home/sybase/RAX/ResponseFile.txt*.

In the event of an installation error, see “Installation troubleshooting” on page 49.

To verify that the software components have been installed correctly, see “Verifying the installation” on page 50.

Postinstallation task Set up the SYBASE environment on the Replication Agent host machine. For more information, see “Setting up the SYBASE environment variable” on page 49.

Installation troubleshooting

You can view debug information during installation. To display the information:

- On UNIX – set the environment variable `LAX_DEBUG` to true and run the installation program. The debug information appears on the window where you launched the installation program.
- On Windows – Hold the Control key and double click `setupConsole.exe` (for console mode installation) or `setup.exe` (for GUI mode installation), the installation program. The debug information appears on the window where you launched the installation program.

Setting up the SYBASE environment variable

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

This sets up the value of `%SYBASE%` (Microsoft Windows) or `$$SYBASE` (UNIX) to point to the Replication Agent installation directory.

❖ Setting up the SYBASE environment variable

- 1 Log in to the Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Replication Agent instance (for example, the “sybase” user).
- 2 At the command prompt, execute the *SYBASE* batch or script file:

- On Microsoft Windows:

```
c:\path\SYBASE
```

where *path* is the Sybase installation directory, for example:

```
c:\sybase\SYBASE
```

- On UNIX:

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

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

Verifying the installation

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

SYBASE environment scripts

The installation program creates SYBASE environment scripts that set PATH and other environment variables on the Replication Agent host machine. These scripts allow you to run the 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:

- *SYBASE.bat* on Microsoft Windows platforms
- *SYBASE.sh* or *SYBASE.csh* on UNIX platforms

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 Replication Agent host machine.

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

See “Setting up the SYBASE environment variable” on page 49.

Uninstalling the Replication Agent software

The uninstallation wizard removes Replication Agent and its related components. You can run the Uninstall wizard in either GUI mode or console mode; however, Sybase recommends that you use GUI mode.

Before uninstalling, consider:

- If two or more Sybase products have been installed using the same installation technology such as InstallAnywhere or InstallShield Multiplatform installer, the uninstallation program does not remove the products' shared components until all the Sybase products are uninstalled. However, for Sybase products that have been installed in the same directory using different installation technologies, files that share the same name may be removed or overwritten. Sybase recommends that you use the same installation technology to install into or uninstall from a shared installation directory.

Warning! If you have installed Replication Agent into a directory where other Sybase products have been installed using an installation program other than InstallAnywhere, do not uninstall Replication Agent or the other Sybase. Doing so may remove components shared by Sybase products and affect their operation.

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

Note The uninstallation program does not remove the root installation directory (`%SYBASE%` or `$SYBASE`) or the `SYSAM-2_0` directory and its subdirectories.

Uninstalling on a Microsoft Windows platform

Before uninstalling the Replication Agent software:

- Log in to the Replication Agent host machine using an account with administrator privileges.
- Shut down all Replication Agent instances and all other processes for the components you are uninstalling.

❖ Uninstalling in GUI mode on Microsoft Windows platforms

- 1 Start the uninstallation program in GUI mode using one of these methods:
 - Select Start | Settings | Control Panel | Add/Remove Programs.
 - At the command prompt, enter:

```
%SYBASE%\sybuninstall\RAX\uninstall.exe
```

- Click Start | Run and then enter:

```
%SYBASE%\sybuninstall\RAX\uninstall.exe
```

- In Microsoft Windows Explorer, double-click the *uninstall.exe* file icon.
- 2 Click Next.
 - 3 Verify the summary information in the Pre-Uninstall Summary window. Click Next.

The installation program removes the files and directories associated with the products and features you selected.

- 4 Click Done.

Note Sybase recommends that you do *not* remove shared files.

❖ Uninstalling in console mode on Microsoft 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 Replication Agent installation directory.

- 3 At the command prompt, invoke the uninstallation program:

```
sybuninstall\RAX\uninstall.exe -i console
```

- 4 Follow the instructions in the wizard to uninstall the Replication Agent software.

Note Sybase recommends that you do *not* remove shared files.

Uninstalling on a UNIX platform

Before uninstalling the Replication Agent software:

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

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

❖ Uninstalling in GUI mode on UNIX platforms

- 1 At the command prompt, enter:

```
    $SYBASE/sybuninstall/RAX/uninstall
```

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

- 2 Click Next.
- 3 Verify the summary information in the Pre-Uninstall Summary window. Click Next.

The installation program removes the files and directories associated with the products and features you selected.

- 4 Click Done.

Note Sybase recommends that you do *not* remove shared files.

❖ Uninstalling 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 Replication Agent installation directory.

- 3 At the command prompt, invoke the uninstallation program:

```
    sybuninstall/RAX/uninstall -i console
```

- 4 Follow the instructions in the wizard to uninstall the Replication Agent software.

Note Sybase recommends that you do *not* remove shared files.

Installation program command line options

Table 2-1 lists the command line options you can use when running the Replication Agent installation or uninstallation program.

Table 2-1: Command line options

Option	Purpose
-\?	Displays the installer help.
-D	Passes custom variables and properties. For example, to override the default installation directory when you run the installer, enter: <code><install_launcher_dir></code> <code>-DUSER_INSTALL_DIR=E:\Sybase</code>
-f	References a response file.
-i console	Uses the console interface mode. Installation messages appear on the Java console and the wizard runs in console mode.
-i silent	Installs or uninstalls the product in silent mode. The installation or uninstallation is performed without user interaction.
-i swing	Installs or uninstalls the product in GUI mode. This is the default.
-l	Sets the installer's locale. Currently, only <code>us_en</code> is supported.
-r	Generates a response file and a reference.

Note When using command line options, specify the full path, including the file name of the response file.

Additional tasks

After you install Replication Agent, you must create one instance of the Replication Agent for each primary database from which you will replicate transactions. See the *Replication Agent Administration Guide* for information about creating a Replication Agent instance and setting up the Sybase Replication Agent system.

If you are upgrading or downgrading your Replication Agent, see the *Replication Agent Primary Database Guide* for database-specific details.

Glossary

This glossary describes Sybase Replication Agent terms.

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.
- Sybase® IQ manages multiple, large relational databases with special indexing algorithms to support high-speed, high-volume business intelligence, decision support, and reporting client applications.
- SQL Anywhere manages relational databases with a small DBMS footprint, which is ideal for embedded applications and mobile device applications.

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

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. Bulk copying 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 different 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 standalone 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 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, 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 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	<p>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.</p> <p>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 replicate device.</p> <p>See also disk replication and transaction replication.</p>
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 Replication Agent that interacts with the primary database to capture transactions for replication. See also Log Transfer Interface and Log Transfer Manager .
Log Transfer Interface	An internal component of the 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 Replication Agent that interacts with the other Replication Agent internal components to control and coordinate 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 Sybase Replication Agent system can begin replicating transactions. See also atomic materialization , bulk materialization , and nonatomic materialization .
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 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	<p>In a replication system, a state in which all updates have been propagated to their destinations. Some Replication Agent and Replication Server commands require that you first quiesce the replication system.</p> <p>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.</p> <p>This term is interchangeable with quiesced and in quiesce. See also quiesce.</p>
RASD	An abbreviation for 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 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 .
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 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 nonprocedural 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. Replication Agent reads the transaction log to identify and acquire the transactions to be replicated from the primary database. See also 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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