SYBASE®

An **SAP** Company

Installation Guide

Replication Agent™ 15.7.1
SP100

Linux, Microsoft Windows, and UNIX

Contents

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Conventions

Learn about the style and syntax conventions used in Sybase® documentation.

Style conventions

Key	Definition
`monospaced(fixed-width)`	• SQL and program code • Commands to be entered exactly as shown • File names • Directory names
`italic monospaced`	In SQL or program code snippets, placeholders for user-specified values (see example below).
italic	• File and variable names • Cross-references to other topics or documents • In text, placeholders for user-specified values (see example below) • Glossary terms in text
bold sans serif	• Command, function, stored procedure, utility, class, and method names • Glossary entries (in the Glossary) • Menu option paths • In numbered task or procedure steps, user-interface (UI) elements that you click, such as buttons, check boxes, icons, and so on

If necessary, an explanation for a placeholder (system- or setup-specific values) follows in text. For example:

Run:

```
installation directory\start.bat
```

where *installation directory* is where the application is installed.

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.
...	An ellipsis (three dots) means you may repeat the last unit as many times as you need. Do not include ellipses in the command.

Case-sensitivity

- All command syntax and command examples are shown in lowercase. However, replication command names are not case-sensitive. For example, **RA_CONFIG**, **Ra_Config**, and **ra_config** are equivalent.
- Names of configuration parameters are case-sensitive. For example, **Scan_Sleep_Max** is not the same as **scan_sleep_max**, and the former would be interpreted as an invalid parameter name.
- Database object names are not case-sensitive in replication commands. However, to use a mixed-case object name in a replication command (to match a mixed-case object name in the primary database), delimit the object name with double-quote characters. For example: **pdb_get_tables** "*TableName*"

Terminology
Replication Agent™ is a generic term used to describe the Replication Agents for Adaptive Server® Enterprise, Oracle, IBM DB2 UDB, and Microsoft SQL Server. The specific names are:

- Replication Agent for Oracle
- Replication Agent for Microsoft SQL Server
- Replication Agent for UDB – for IBM DB2 on Linux, UNIX, and Windows

Replication System Components

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

Table 1. Setting Up a Sybase Replication System

To	See
Install the primary data server.	- Primary data server documentation - Vendor documentation or Web site for the primary data server
Install the connectivity drivers for the primary database server.	*Primary Database Connectivity* on page 11 - Vendor documentation or Web site for the primary data server
Install Replication Server® and create connections. This includes: - Designing the replication system. - Installing Replication Server. - Defining connections from Replication Server to the Embedded Replication Server System Database (ERSSD) and routes between Replication Servers. - Defining connections using ECDA when replicating to a non-Sybase database. **Note:** For Replication Agent for Oracle, you can use ExpressConnect for Oracle, in which case it is unnecessary to install and configure ECDA. See the *ExpressConnect for Oracle Configuration Guide*.	- Replication Server documentation - ECDA documentation *ExpressConnect for Oracle Configuration Guide*
Prepare to install Replication Agent. - Review installation requirements and the installation procedure for Replication Agent. - Complete the Installation and Setup worksheet.	*Planning Your Installation* on page 5 in this document and Chapter 2, "Setting Up and Configuring Replication Agent" in the *Replication Agent Administration Guide* *Replication Server Options 15.7.1 SP100 Release Bulletin*

To	See
Install the Replication Agent software.	*Installing Replication Agent* on page 35
Configure Replication Server and primary data server connections. This includes: • Creating a Replication Server database connection to the primary data server. • Creating a Replication Server login for the 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.	Chapter 3, "Administration" in the *Replication Agent Administration Guide*
Set up the Replication Agent instance. This includes: • Creating the Replication Agent transaction log objects. • Marking primary objects for replication.	Chapter 2, "Setting Up and Configuring Replication Agent" in the *Replication Agent Administration Guide*
Verify that all replication system components are in place.	Chapter 2, "Setting Up and Configuring Replication Agent" in the *Replication Agent Administration Guide*
(optional) 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.	The chapter for your primary data server in the *Replication Agent Primary Database Guide*
Materialize subscriptions to primary data. For each subscription, materialization: • Validates and activates the subscription. • Populates tables in the replicate database so they are synchronized with the primary database before you start replication.	• Replication Server documentation • Appendix A, "Materializing Subscriptions to Primary Data" in the *Replication Agent Administration Guide*
To start replication, put the Replication Agent instance in the *Replicating* state.	Chapter 2, "Setting Up and Configuring Replication Agent" in the *Replication Agent Administration Guide*

To install and configure a sample replication system, see the *Replication Server Options Quick Start Guide*.

Planning Your Installation

Before you install or upgrade, prepare your environment.

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

1. Read the *Replication Server Options 15.7.1 SP100 Release Bulletin*.
2. Obtain a license.

   Note: If you are using served licenses, you must install the SySAM license server version 2.1 or later.

3. Make sure your system meets all requirements for your installation scenario and planned use.
4. Complete the Installation and Setup Worksheet.

Replication Server Options Release Bulletin

The release bulletin contains current information about specific requirements of Replication Agent.

- 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.

Licensing

Replication Agent can be installed as part of a Replication Server Options (RSO), Replication Server Heterogeneous Edition (RSHE), or Real-Time Loading Edition (RTLE) installation. Licensing depends on which product you install.

Licensing Replication Agent in an RSO Installation

Before installing Replication Agent as part of RSO, choose a SySAM license model, determine license server information, and obtain license files.

When you purchase SySAM 2–enabled Sybase products, you must generate, download, and deploy SySAM product licenses.

- If you purchased your product from Sybase or an authorized Sybase reseller, go to the secure Sybase Product Download Center (SPDC) at *https://sybase.subscribenet.com* and log in to generate license keys. The license generation process may vary slightly, depending on whether you ordered directly from Sybase or from a Sybase reseller
- If you ordered your product under an SAP® contract and were directed to download from SAP Service Marketplace (SMP), you can use SMP at *http://service.sap.com/licensekeys* to generate license keys for Sybase products that use SySAM 2-based licenses.

1. Choose a SySAM license model.

License Model	Description
Unserved license model	Licenses are obtained directly from the license file. If you are using an unserved license, save the license file to the machine on which you install the product.
Served license model	A license server manages the allocation of licenses among multiple machines.

2. For the served license model, decide whether to use an existing or new license server.

   The license server and your product installation need not share the same machine, operating system, or architecture.

3. If you chose the served license model:

   - To install on a machine that is running a SySAM 1.0 license server, follow migration instructions in the *SySAM Users Guide* to migrate to the newer SySAM version.

   Note: There can be only one instance of a SySAM license server running on a given machine. To set up a SySAM 2 license server on a machine that is already running a SySAM 1.0 license server, you must migrate the old license server to SySAM 2. A migrated license server can serve licenses for both SySAM 1.0 and SySAM 2-enabled products.

4. Get your host IDs.

   When you generate licenses at the Sybase Product Download Center (SPDC) or SAP Service Marketplace (SMP), you must specify the host ID of the machine where the licenses will be deployed.

   - For unserved licenses – the host ID of the machine where the product will run. If you are running a product with per-CPU or per-chip licensing that supports SySAM sub-capacity and want to run the product in a virtualized environment, see S*ySAM Sub-capacity Licensing* in the *SySAM Users Guide*.
   - For served licenses – the host ID of the machine where the license server will run.

5. Before installing your product, get license files from SPDC or from SMP using the access information you receive from Sybase or your Sybase reseller.

   Log in to SPDC or SMP by using the information in your welcome e-mail message.

Note: If you purchased your Sybase software from a Sybase reseller, you may receive a Web key rather than an e-mail message.

If you plan to use sub-capacity licensing, see the *SySAM Users Guide* for information on how to configure using the **sysamcap** utility.

Licensing Replication Agent in an RSHE Installation

Use a static license for installing Replication Agent as part of RSHE.

With RSHE, all Replication Agent options—Replication Agent for Oracle, Replication Agent for Microsoft SQL Server, and Replication Agent for UDB—are included and licensed statically.

1. Locate the license file that contains a valid SySAM license for the Replication Agent components in RSHE.
2. Specify this license file when the installation program requests it.

Note: See the *Replication Server Options 15.7.1 SP100 Release Bulletin*.

Licensing Replication Agent in an RTLE Installation

Use a static license for installing Replication Agent as part of Real-Time Loading Edition (RTLE).

With RTLE, only the Replication Agent for Oracle option is included. It is licensed statically. This static license, which is for Replication Agent for Oracle, also works with Replication Agent.

Note: RTLE is compatible with Replication Agent for Oracle, but it is a Replication Server product edition that is not included with RSO or RSHE.

1. Locate the license file that contains a valid SySAM license for the Replication Agent component in RTLE.
2. Specify this license file when the installation program requests it.

Note: See the *Replication Server Options 15.7.1 SP100 Release Bulletin*.

SySAM License Server

Learn about the required SySAM license server version to install.

- License server version
  You must install the SySAM license server version 2.1 or later. To determine the current license server version, use the **sysam version** command.

Note: License servers at version 2.0 and earlier do not include this command.

Download the latest license server from the SySAM License Server and Utilities Install Web site at *http://www.sybase.com/sysam/server*.

• FLEXnet Publisher version

Replication Agent 15.5 and later are linked with the FLEXnet Publisher version, which is platform-specific.

Table 2. FLEXnet Publisher Versions Supported on UNIX and Linux Platforms

Platforms	FLEXnet Publisher Version
HP Itanium (64-bit)	11.6.1
IBM AIX (64-bit)	11.6.1
Red Hat Enterprise Linux (RHEL) (64-bit)	11.6.1
SuSE Linux Enterprise Server (SLES) (64-bit)	11.6.1
Solaris SPARC 8, 9, and 10 (64-bit)	11.6.1
Solaris 10 x86-64 (64-bit)	11.6.1

Note: Replication Agent 15.7.1 SP100 includes SySAM version 2.2.0.9. The corresponding FLEXnet Publisher version is updated to 11.6.1.

Table 3. FLEXnet Publisher Versions Supported on Windows Platforms

Platforms	FLEXnet Publisher Version
Windows (32-bit)	11.6.1

If you use a SySAM license server, you must update the SySAM license server to at least version 2.1, which includes the 11.6.1 FLEXnet Publisher license server components on all platforms, before installing Replication Agent 15.7.1 SP 100. To check the version of your license server, examine the license server log, or

• Execute this command on UNIX or Linux:

```
cd $SYBASE/SYSAM-2_0/bin
./lmutil lmver lmgrd
```

• Execute this command on Windows:

```
cd %SYBASE%\SYSAM-2_0\bin
lmutil lmver lmgrd
```

Sub-capacity Licensing

You can license a physical machine, machine partition, or a resource partition using sub-capacity licensing.

Sybase now offers sub-capacity licensing options. Sub-capacity licensing refers to licensing a Sybase product on a subset of the CPUs available on a physical machine.

Note: Sub-capacity licensing is unavailable for products that are licensed statically.

Platform Support

Table 4. SySAM Virtualization Sub-capacity Compatibility

Vendor	Product	Platform Support	Virtualization Type
HP	nPar	HP IA 11.31	Physical partition
	vPar		Virtual partition
	Integrity Virtual Machines with Resource Manager		Virtual machine
	Secure Resource Partitions		OS containers
IBM	LPAR	AIX 6.1, AIX 7	Virtual partition
	dLPAR		Virtual partition
Oracle	Dynamic System Domains	Solaris 10	Physical partition
	Solaris Containers/Zones with Solaris Resource Manager		OS partition
	Solaris Logical Domain (LDOM)	Solaris 11	Virtual partition
Intel, AMD	VMWare ESX Server* Guest OS: Windows	VMWare ESX 3.5, ESX 4.1, and ESXi 5.0 Guest OS: Windows 7, Windows 2008, Windows 2008 R2, Windows 8, and Windows 2012	Virtual machine

Vendor	Product	Platform Support	Virtualization Type
	VMWare ESX Server Guest OS: Linux, Sun x86-64	VMWare ESX 3.5, ESX 4.1, and ESXi 5.0 Guest OS: Red Hat 5.7, 6.1, SUSE 11, and Solaris 10 x64	Virtual machine
	Xen,** DomainU, KVM: Windows	Windows 2008 R2 and Windows 7	Virtual machine
	Xen, DomainU, KVM: Linux	Red Hat 5.7, 6.1, and SUSE 11	Virtual machine
	Hyper-V	Windows 2008 R2 Guest OS: Windows 2008 R2, Windows 7, Red Hat 6.1, and SUSE 11	Virtual machine

* VMWare ESX Server excludes VMWare Workstation and VMWare Server.

** Xen excludes Solaris x64.

Enabling Sybase Sub-capacity Licensing

You must have a sub-capacity licensing agreement with Sybase before you can enable sub-capacity licensing. As with other Sybase licenses, you must generate a license key. For specific steps, see the *SySAM Quick Start Guide*.

Note: Keep your license server up-to-date.

Although the installation media include a copy of the most recent SySAM license server, Sybase recommends that you periodically check for license server updates on the SySAM Standalone License Servers Web site at *http://www.sybase.com/sysam/server*.

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.

Database Servers

Replication Agent supports only certain database servers on Linux, UNIX, and Microsoft Windows platforms.

The supported database servers are:

- Oracle
- Microsoft SQL Server database with Replication Agent running only on Microsoft Windows
- IBM DB2 Universal Database (UDB) for Linux, UNIX, and Windows

Note: The database server versions that are required and supported by Replication Agent are listed in the *Replication Server Options 15.7.1 SP100 Release Bulletin*.

Be aware of the following Replication Agent requirements for these data servers:

- Replication Agent for Oracle must be installed on the same platform of UNIX or Microsoft Windows host as the primary Oracle data server. Direct access to the Oracle logs is necessary if pdb_archive_remove is true and rman_enabled is false. See the *Replication Agent Reference Manual*.
- 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.

In your Sybase Replication Agent system environment, verify that the:

- Primary data server and primary database are online and configured properly for your production systems. See the documentation provided by your database software vendor.
- Replication Server is installed, configured, and running. See the Replication Server installation and configuration guides for your platform.

Primary Database Connectivity

Replication Agent connects to primary data servers using a JDBC™ driver that implements the JDBC 4.0 standard.

You must install the correct connectivity driver for your primary database environment before installing Replication Agent. The drivers that are required and supported by Replication Agent are listed in the *Replication Server Options 15.7.1 SP100 Release Bulletin*.

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.

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.

Setting Up Connectivity to a DB2 UDB Server

Replication Agent for IBM DB2 Universal Database (UDB) must be installed on the same UNIX or Microsoft Windows host as the primary 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 datasource 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.

See the IBM publication, *DB2 Universal Database and DB2 Connect, Installation and Configuration Supplement*.

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

   Add the following to the `.login` file of the user account that starts and stops the Replication Agent instance:
   ```
   source /path_name/sqllib/db2cshrc
   ```

   where `path_name` is where you installed the DB2 client. 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 automatically modifies all required environment variables.

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

   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 datasource name for the primary database.

Setting Up 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 vendor Web site.

- For the Oracle JDBC driver, go to the Oracle download page for JDBC drivers. Scroll down to **Drivers**, and click **JDBC Drivers**.
- For the Microsoft SQL Server JDBC driver, go to Microsoft download page for JDBC drivers.

1. Install the JDBC driver on the host machine on which Replication Agent resides.
2. Add the location of the JDBC driver to the CLASSPATH environment variable.

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

Log out and log back in for this change to take effect, or issue **source .login** after the change.

Note: Microsoft SQL Server is not available on UNIX.

- On Microsoft Windows:

  Select **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 versions 11g Release 1 and earlier, the name is `ojdbc5.jar`. For Oracle version 11g Release 2, the name is `ojdbc6.jar`.
    - For Microsoft SQL Server, the name is `sqljdbc.jar`.

  Click **Apply > OK**.

Note: Replication Agent for Microsoft SQL Server must be installed on Microsoft Windows.

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.

Java Runtime Environment

Replication Agent requires the Java Runtime Environment (JRE).

Because Replication Agent is a Java-based application, it requires a Rava Runtime Environment (JRE) 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 SE 7. See the following Web sites to determine which patches are required for your platform and for current information about JREs for your platform:

- the Oracle Java SE Overview
- the AIX download and service information for Java SE version 7

- the JDK/JRE 7.0.x downloads and documentation for HP-UX

Platforms and Operating Systems

Learn about the platforms and operating systems that are required to run Replication Agent.

Table 5. 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 6.1, 7.1 (64-bit only)
Linux/Intel [a]	Linux x64: • Red Hat Enterprise Linux 5.7, 5.8, 6.1, 6.2, 6.3 • SuSE Linux Enterprise Server 11.1, 11.2
Microsoft Windows	Windows x86 and x64: • Windows Server 2008 R1-SP2, R2-SP1 • Windows XP Professional • Windows 7 • Windows Server 2012
Solaris (SPARC) [a] Solaris x64[b]	Solaris 10, 11 (64-bit only)
a. Replication Agent for Microsoft SQL Server is supported only on Microsoft Windows.	
b. Replication Agent for Oracle is supported only in this UNIX platform.	

Ensure that the required operating system patches for Java are installed before you install Replication Agent.

Table 6. Operating System Patch Requirements

Platform	Reference
HP-UX Itanium	HP-UX Java patch information page.
IBM AIX	AIX download and service information page.
Solaris (SPARC)	Java SE downloads page.

Memory, Disk Space, and Media Device

You must meet the minimal hardware requirements before installing Replication Agent.

Your Replication Agent configuration may require more memory and disk space than the minimum listed here.

Memory	512MB RAM
Disk space	The exact disk space needed to install Replication Agent is reflected by the installation program and is dependent on the components that you install with Replication Agent. Installing Replication Agent, SySAM utilities, and SySAM server requires: • HP-UX: 740MB • IBM AIX: 480MB • Linux: 390MB • Microsoft Windows: 360MB • Solaris: 390MB
Temporary disk space	The installation program uses the `/tmp` directory to uncompress files used during the installation, such as JRE, and the SySAM and Replication Agent components. The temporary space required to install Replication Agent is: • HP-UX: 900MB • IBM AIX: 680MB • Linux: 650MB • Microsoft Windows: 530MB • Solaris: 720MB

Replication Agent System Database

Each Replication Agent for Oracle, Replication Agent for Microsoft SQL Server, and Replication Agent for IBM DB2 UDB instance use 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 replicated tables and procedures 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.

See the *Replication Agent Administration Guide*.

Installation Program Requirements

Before installing Replication Agent, review the installation requirements.

GUI and Console Mode Installation

Determine the installation mode for installing Replication Agent. 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 monitor, keyboard, and pointing device, you need access to a remote machine with a GUI environment that is 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 you are installing the Replication Agent software.

Note: You can also use the installation program wizard in console mode to install Replication Agent from an operating system command prompt, without a GUI environment.

Home Directory Access

When installing on UNIX or Linux, the Replication Agent installation program requires write access to your home directory.

Visual C++ 2005 Runtime Components

On a Microsoft Windows platform, the Replication Agent 15.7.1 SP100 installation program requires components of the Microsoft Visual C++ 2005 libraries. When Microsoft Visual C++ 2005 libraries are not installed, the installer stops responding without a warning or an error message.

To verify whether the Microsoft Visual C++ 2005 Redistributable Package is installed, select **Start > Control Panel > Add or Remove Programs**, and search for Microsoft Visual C++ 2005 Redistributable.

If necessary, you can download the Microsoft Visual C++ 2005 SP1 Redistributable Package (x86) from *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.

Replication Agent 15.7.1 SP100 Installation Directory

Replication Agent uses the RAX-15_5 directory name.

If you have an existing Replication Agent 15.5 or 15.6 installation and want to keep this version separate, install Replication Agent 15.7.1 SP100 into a different directory. Replication Agent 15.7.1 SP100 installer does not overwrite any previous version of Replication Agent installed in the existing RAX-15_5 directory.

Team Skill Requirements

To successfully install and configure a replication environment using Replication Agent, you need team members with specific skills.

Table 7. Replication Agent Installation Skill Requirements

Role	Skill Set
Operating system administrator	• Understands Linux, Solaris, HP-UX, AIX, or Microsoft Windows operating system • Knows standards and conventions at the installation site
Communications administrator	• Understands connectivity and communication protocols, such as TCP/IP, used at your site • Understands your site's network configuration • Can design, establish, test, and troubleshoot remote communications between the primary database, Replication Agent, and Replication Server
Replication Server administrator	• Understands Replication Server and the replication system environment • Has Replication Server administrator privileges
Enterprise Connect™ Data Access (ECDA) administrator	• Understands ECDA and applying data to non-Sybase databases • Has ECDA administrator privileges
ExpressConnect for Oracle administrator	• Understands ExpressConnect for Oracle and applying data to Oracle databases • Has ExpressConnect for Oracle administrator privileges

Role	Skill Set
Primary database administrator	• Understands the primary database • Has primary database administrator privileges

Completing the Installation and Setup Worksheet

Record all the information you need to install and configure your replication system.

Note: This worksheet organizes several configuration parameter values and other values that you need to know to properly install Replication Agent.

1. Make a copy of the Installation and Setup worksheet, and record the required information. You may need to refer to the worksheet as you install and set up Replication Agent.

2. Save a copy of the completed worksheet to refer to during future Sybase product installations or upgrades.

Completing Section 1: Replication Agent Administration Information

Determine the Replication Agent administration information, and record it in Section 1 of the 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 the same platform of UNIX or Microsoft Windows host as the primary Oracle instance. Direct access to the Oracle logs is necessary if **pdb_archive_remove** is true and **rman_enabled** is false. See the *Replication Agent Reference Manual*.
   - **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 the DB2 Administration 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 the system administrator which port number you should use for the Replication Agent administration port. Port numbers have a range of 1 to 65,535.

Record the port number as item **1c** (**admin_port**) in Section 1: Replication Agent Administration Information on the Installation and Setup Worksheet. Replication Agent for Oracle, Replication Agent for Microsoft SQL Server, and IBM DB2 UDB 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.

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 **jisql** utility. The interfaces file must reside on the same machine as the Replication Agent client (**isql**), 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.

See the *Replication Agent Administration Guide*.

Record the administrative user ID as item **1e** (**ltm_admin_user**) and the password as item **1f** (**ltm_admin_pw**) in Section 1: Replication Agent Administration Information on the Installation and Setup Worksheet.

Completing Section 2: Replication Server Parameter Values for the Primary Database Connection

Determine the values of the connection parameters for Replication Server, and record them in Section 2 of the worksheet. 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*.

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 but 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.

Completing Section 3: Replication Agent Parameter Values for Replication Server

Determine the values of the Replication Agent configuration parameters for the primary Replication Server, and record them in Section 3 of the worksheet. 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*.

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. 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. 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 the 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 automatically 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.

Completing Section 4: Replication Agent Parameter Values for the ERSSD or RSSD

Determine the values of the Replication Agent configuration parameters for the ERSSD or the RSSD for the primary Replication Server, and record them in Section 4 of the worksheet.

> **Note:** Replication Agent supports connection to either ERSSD or RSSD. Because there is no difference in configuration between the two, this information refers to both RSSD and ERSSD installations referred to here as "RSSD."

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. 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 an RSSD user 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.

Completing Section 5: Replication Agent Parameter Values for the Primary Data Server

Determine the values of the Replication Agent configuration parameters for the primary data server, and record them in Section 5 of the 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 can leave **asm_tns_filename** unset. Also identify the name of the ASM data server, ASM connection, ASM user name, 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 user name 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 the Installation and Setup Worksheet. 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. Port numbers have a range of 1 to 65,535.

   Record the client socket port number as item **5g** (**pds_port_number**) 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 datasource name (DSN) configured in the ODBC driver or the catalogued database alias for the primary database. The value of the datasource name parameter (**pds_datasource_name**) must be the DB2 database alias that identifies the primary database.

Record the appropriate value for the datasource 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. 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*.

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 7 character sets, see the Supported Encodings on the internationalization page at *http://docs.oracle.com/javase/7/docs/technotes/guides/intl/encoding.doc.html*.

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. (Microsoft SQL Server) Identify the dedicated administration port number (**pds_dac_port_number**). 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.

Completing Section 6: Replication Server Parameter Values for the Replicate Data Server

Determine the values of the parameters for the replicate data server, and record them in Section 6 of the worksheet. These values are used in the materialization step.

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 are 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**	

Item	Description	Example Value	Your Value
1b	Replication Agent instance name This name must be unique among all Replication Agent instances.	*ra_sales_instance*	
1c	**admin_port** This is the client socket port number for the Replication Agent administration port. The port number must be unique (not used by any other application on the Replication Agent host machine). **Note:** Check with the system administrator to determine which port numbers are available. **Note:** Replication Agent for Oracle, Replication Agent for Microsoft SQL Server, and IBM DB2 UDB 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.	10000	
1d	Location of the `interfaces` file. Use this item only if you plan to use the **isql** utility.	• On UNIX: `$SYB-ASE/interfaces` • On Microsoft Windows: `%SYBASE%\ini\sql.ini`	
1e	**ltm_admin_user** This is the administrative user ID you use to log in to the Replication Agent instance.	*admin_user*	

Item	Description	Example Value	Your Value
1f	**ltm_admin_pw** This is the administrative password you use to log in to the Replication Agent instance. The default Replication Agent password policy requires a password to be at least six characters but not more than 255 characters.	*admin_pw*	

Section 2: Replication Server Parameter Values for the Primary Database Connection

Item	Description	Example Value	Your Value
2a	**rs_source_ds** This is a data server name representing the primary data server to which Replication Agent connects. This value is specified in the Replication Server **create connection** command used to create the Replication Agent connection in the primary Replication Server. **Note:** This name can be the name of the Replication Agent instance.	*ra_sales_instance*	
2b	**rs_source_db** This is a database name representing the primary database to which Replication Server connects. This value is specified in the Replication Server **create connection** command used to create the Replication Agent connection in the primary Replication Server. **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**.	*sales_db*	

Item	Description	Example Value	Your Value
2c	Maintenance user This is the Replication Server maintenance user ID associated with the connection to the primary database. Replication Server requires a maintenance user ID for every database connection. This value is used in the **create connection** command when you create the connection to the primary database. **Note:** This user ID must be valid at the primary database.	*maint_user*	
2d	Maintenance user password This is the Replication Server maintenance user password associated with the connection to the primary database.	*maint_pwd*	

Section 3: Replication Agent Parameter Values for Replication Server

Item	Description	Example Value	Your Value
3a	**rs_host_name** This is the name or IP address of the Replication Server host machine.	*rs_host*	
3b	**rs_port_number** This is the port number Replication Agent uses to log in to Replication Server.	1111	

Item	Description	Example Value	Your Value
3c	**rs_username** This is the Replication Server client user ID that Replication Agent uses to log in to the primary Replication Server. This user ID must have **connect source** authority in the Replication Server. **Note:** The value for the **rs_username** parameter cannot be the same as the value for the **pdb_maint_user** parameter (item **2c**).	*rs_user*	
3d	**rs_password** This is the Replication Server client user password that Replication Agent uses.	*rs_pw*	

Item	Description	Example Value	Your Value
3e	**rs_charset** **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 automatically queries the Replication Server property **RS_charset**. 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 `$SYBASE/REP-15_0/in-stall/`*instance_name*`.cfg`, where *instance_name* is the name of the Replication Agent instance. **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.	• On UNIX: *iso_1* • On Windows: *cp850*	

Section 4: Replication Agent Parameter Values for the RSSD

Item	Description	Example Value	Your Value
4a	**rssd_host_name** This is the name of the host machine on which the RSSD of the primary Replication Server resides.	*rssd_host*	
4b	**rssd_port_number** This is the client socket port number for the RSSD data server.	1111	
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 `tnsnames.ora` 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 `tnsnames.ora` file	*SALES_DB_CON N*	

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

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

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 not need to explicitly set the character set-related environment variable, RA_JAVA_DFLT_CHARSET. However, the system default character set must match the character set of the primary database.	• 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.	*rds_host*	

Item	Description	Example Value	Your Value
6b	Replicate database name This is the name of the replicate database on the replicate database server. You need this name when you create subscriptions. See the Replication Server documentation.	*replicate_db*	
6c	**ddl_username** **Note:** This value is for Oracle and Microsoft SQL Server only. This is the replicate database client user ID that Replication Server uses to log in to the replicate database to apply DDL commands. This user ID must have authority in the replicate database to create any schema or issue any DDL command replicated from the primary database. The Replication Agent sends this ID and password to Replication Server together with any DDL command executed at the primary database. **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.	*scott*	
6d	**ddl_password** **Note:** This value is for Oracle and Microsoft SQL Server only. This is the replicate database client user password that Replication Server uses with the value for **ddl_username**.	*tiger*	

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

- *Replication Agent Administration Guide* –
  initial configuration of Replication Agent parameters for Replication Server
- *Replication Agent Primary Database Guide* –
  initial configuration of the primary database you are replicating
- *Replication Agent Reference Manual* –
  ra_config command
- *Replication Server Reference Manual* –
  Replication Server commands and parameters

Installing Replication Agent

Install Replication Agent using your chosen method.

Prerequisites
Complete installation planning tasks.

Task

Note: SySAM 2, the Sybase Software Asset Management license manager, is automatically installed if needed.

1. Choose an installation method.
   - GUI wizard
   - Console mode
   - Response file

   If you are installing in console mode, review the installation program command line options.
2. Follow instructions for your chosen method.
3. Perform postinstallation steps.

Installation Program Command Line Options

Review the command line options that you can use when installing or uninstalling Replication Agent in console mode.

Table 8. 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: `<install_launcher_name> -DUSER_INSTALL_DIR=E:\Sybase`
-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.
-l	Sets the installer's locale. Currently, only us_en 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.

Displaying Debug Information

Display debug information during an installation.
On UNIX, set the environment variable LAX_DEBUG to true, and run the installation program.

On Windows, hold the **Ctrl** key and double-click `setupConsole.exe` (for console mode installation) or `setup.exe` (for GUI mode installation).

The debug information appears in the window where you launched the installation program.

Note: If there are errors during installation, check the installation log file at `$SYBASE/log` (UNIX) or `%SYBASE%\log` (Windows).

Installing Replication Agent with the GUI Wizard

Install Replication Agent using the GUI wizard.

Installing with the GUI wizard requires either 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.

Note: If there is not enough disk space in your default temporary directory, set the IATEMPDIR (Linux or UNIX) or TMP (Windows) environment variable to a directory that has enough space. Include the full path to this directory.

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 15.7.1 SP100 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.

   • On UNIX platforms, enter:

   ```
   cd /cdrom
   ```

   ```
   ./setup.bin
   ```

   Click **Next**.

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

5. Select the geographic location, agree to the license agreement, then click **Next**.

6. 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 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 15.7.1 SP 100, 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.

7. Select the primary database the Replication Agent will connect to:

   - Oracle
   - Microsoft SQL Server
   - IBM DB2 for Linux, UNIX and Windows

   Click **Next**.

8. Select one of these options to enter the license:

   - **Specify license keys** – browse to or 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 a valid license from the Sybase Product Download Center at *http://www.sybase.com/detail?id=1025266*, and install it. See the *Sybase Software Asset Management Users Guide*.

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

9. 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:

   - 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:
     - Informational
     - Warning
     - Error

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

   Click **Next**.

10. 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.

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

11. Click **Done** to complete the installation and close the installation program.

Installing Replication Agent in Console Mode

Install the Replication Agent software in an interactive text (or console) mode

Installing Replication Agent in console mode uses the same steps as those for the GUI wizard, except you:

Note: If there is not enough disk space in your default temporary directory, set the IATEMPDIR (Linux or UNIX) or TMP (Windows) environment variable to a directory that has enough space. Include the full path to this directory.

• Invoke the installation program wizard at the command prompt, and
• 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.

See *Installation Program Command Line Options* on page 35 for information about the command line options you can use with the installation program.

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

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 15.7.1 SP100 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. 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.

6. Follow the remaining wizard prompts to install the Replication Agent 15.7.1 SP100 software.

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.

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

Installation Using a Response File

A response file contains responses to all of the installation program wizard prompts.

You can install the Replication Agent 15.7.1 SP100 software using a response file in either console mode or silent mode.

Note: If there is not enough disk space in your default temporary directory, set the IATEMPDIR (Linux or UNIX) or TMP (Windows) environment variable to a directory that has enough space. Include the full path to this directory.

Response File Creation

Create a response file by recording your responses to the wizard when you install in either the GUI or console mode. The response file is created when the installation wizard exits.

If necessary, you can edit the response file—which is a text file—for subsequent installations, for example, if one or more of the responses differs between installations.

Note: Replication Agent version 15.5 or later uses a rearchitected installation program that is incompatible with response files generated for versions prior to 15.5. Do not use response files from these earlier versions; instead, create a new one from 15.7.1 SP100 installation.

Creating a Response File by Recording a GUI or Console Installation

Create a response file for installing Replication Agent by recording your responses to a GUI or 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 15.7.1 SP100 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.
5. Invoke the installation program wizard at the command prompt, using the **-r** option:

GUI	• 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`.

Console	• 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 the selected mode, and captures all of the prompt responses in a file with the name you specify.

In the event of an installation error, exit the installation program wizard to correct the cause of the error, then restart the installation program.

Installing Replication Agent in Console Mode with a Response File

Perform an interactive installation of Replication Agent using the response file you created.

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 the installation.

Note: You must specify values for **ltm_admin_user** and **ltm_admin_pw** in the response file before you invoke the installation program.

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 Replication Agent with the GUI Wizard" 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.

To verify that the software components were installed correctly, see "Installation Verification."

Installing Replication Agent in Silent Mode with a Response File

Perform a silent installation of Replication Agent using the response file you created.

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.

Note: You must specify values for **ltm_admin_user** and **ltm_admin_pw** in the response file before you invoke the installation program.

Invoke 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!** 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`.

To verify that the software components were installed correctly, see "Installation Verification."

Postinstallation Tasks

Perform the following postinstallation tasks after successfully installing Replication Agent.

- Set up the SYBASE environment variable
- Verify the installation

Setting Up the SYBASE Environment Variable

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

Set the value of %SYBASE% (Microsoft Windows) or $SYBASE (UNIX) to the Replication Agent installation directory.

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.bat
```

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

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

- On UNIX:

```
source path/SYBASE.csh
```

where *path* is the Replication Agent installation directory.

Installation Verification

Verify that the installation was successful by confirming the creation of subdirectories and environment scripts.

If your installation of Replication Agent is successful, you see 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 also 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:

- `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.

Additional Tasks

Perform postinstallation tasks to prepare Replication Agent for replication.

After you install Replication Agent, 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.

Uninstallation

Use the uninstallation wizard to remove Replication Agent and its related components.

You can run the uninstallation wizard in GUI mode, console mode, or silent mode; however, Sybase recommends that you use GUI mode.

Note: The uninstaller removes only those files that were loaded from the installation media. Some Sybase files, such as log and configuration files, are left intact for administrative purposes. `jre` and other installed directories are also not removed by the uninstaller. You must manually remove these directories.

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 products. 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.

Uninstallation on a Microsoft Windows Platform

You can uninstall Replication Agent in GUI mode, console mode, or silent mode.

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

Uninstall Replication Agent in GUI mode.

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

Uninstall Replication Agent in console mode.

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 in Silent Mode on Microsoft Windows Platforms

Uninstall Replication Agent in silent mode.

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 silent
   ```

Uninstallation on a UNIX Platform

You can uninstall Replication Agent in GUI mode, console mode, or silent mode.

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

Uninstall Replication Agent in GUI mode.

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

Uninstall Replication Agent in console mode.

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.

Uninstalling in Silent Mode on UNIX Platforms

Uninstall Replication Agent in silent mode.

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 silent
   ```

Obtaining Help and Additional Information

Use the Product Documentation site and online help to learn more about this product release.

*   Product Documentation at *http://sybooks.sybase.com/* – online documentation that you can access using a standard Web browser. You can browse documents online, or download them as PDFs. The Web site also has links to other resources, such as white papers, community forums, maintenance releases, and support content.
*   Online help in the product, if available.

To read or print PDF documents, you need Adobe Acrobat Reader, which is available as a free download from the *Adobe* Web site.

Note: A more recent release bulletin, with critical product or document information added after the product release, may be available from the Product Documentation Web site.

Technical Support

Get support for SAP® products.

If your organization has purchased a support contract for this product, then one or more of your colleagues is designated as an authorized support contact. If you have any questions, or if you need assistance during the installation process, ask a designated person to contact Technical Support as specified in your contract:

*   Sybase Technical Support or the Sybase subsidiary in your area
*   SAP Technical Support

Customers with an SAP support contract can obtain support for this product at the SAP support site, *http://service.sap.com/sybase/support*. You can also find information about Sybase support migration at this location (login may be required).

Customers with a Sybase support contract can obtain support for this product at *http://www.sybase.com/support* (login required).

Downloading Product Updates

Get maintenance releases, support packages and patches, and related information.

*   If you purchased the product directly from Sybase or from an authorized Sybase reseller:
    a) Go to *http://www.sybase.com/support*.
    b) Select **Support > EBFs/Maintenance**.

    c) If prompted, enter your MySybase user name and password.

    d) (Optional) Select a filter, a time frame, or both, and click **Go**.

    e) Select a product.

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

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

- If you ordered your product under an SAP contract:

    a) Go to *http://service.sap.com/swdc* and log in if prompted.

    b) Select **Search for Software Downloads** and enter the name of your product. Click **Search**.

Product and Component Certifications

Certification reports verify Sybase product performance on a particular platform.

To find the latest information about certifications:

- For partner product certifications, go to *http://www.sybase.com/detail_list?id=9784*
- For platform certifications, go to *http://certification.sybase.com/ucr/search.do*

Accessibility Features

Accessibility ensures access to electronic information for all users, including those with disabilities.

Documentation for this product is available in an HTML version that is designed for accessibility.

Vision impaired users can navigate through the online document with an adaptive technology such as a screen reader, or view it with a screen enlarger.

HTML documentation has been tested for compliance with accessibility requirements of Section 508 of the U.S Rehabilitation Act. Documents that comply with Section 508 generally also meet non-U.S. accessibility guidelines, such as the World Wide Web Consortium (W3C) guidelines for Web sites.

Note: You may 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 the Sybase Accessibility site: *http://www.sybase.com/products/accessibility*. The site includes links to information about Section 508 and W3C standards.

You may find additional information about accessibility features in the product documentation.

Glossary

This glossary describes Replication Server Options 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® (formerly Adaptive Server Anywhere) manages relational databases with a small DBMS footprint, which is ideal for embedded applications and mobile device applications.

  See also *DBMS* and *RDBMS*.

- **atomic materialization** – a materialization method that copies subscription data from a primary database to a replicate 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 replicate 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*.

- **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*.
- **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 primary data to remote locations and synchronizing the copied data with the primary data. Data replication is different from data distribution. Replicated data is a stored copy of data at one or more remote sites throughout a system, and it is not necessarily distributed data. Contrast with *data distribution*. See also *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*.
- **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*.
- **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 switches access from the primary database to a replicate database. See also *failover*.
- **failover** – a procedure that switches user and client access from a primary database to a replicate 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 data server object that represents an operation or set of operations. Replication Server distributes operations to replicate databases as functions. See also *stored procedure*.
- **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 replicate 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 Replication Agent. See also *Java VM*.

- **LAN** – an abbreviation for "local area network," a computer network located on the user premises and covering a limited geographical area (usually a single site). Communication within a local area network is not subject to external regulations; however, communication across the LAN boundary can be subject to some form of regulation. Contrast with *WAN*.

- **latency** – in transaction replication, the time it takes to replicate a transaction from a primary database to a replicate database. Specifically, latency is the time elapsed between committing an original transaction in the primary database and committing the replicated transaction in the replicate database.

  In disk replication, latency is the time elapsed between a disk write operation that changes a block or page on a primary device and the disk write operation that changes the replicated block or page on a replicate device.

  See also *transaction replication*.

- **LOB** – an abbreviation for large object, a large collection of data stored as a single entity in a database.

- **Log Reader** – an internal component of 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 Replication Agent that interacts with Replication Server to forward transactions for distribution to Replication Server. See also *Log Reader* and *Log Transfer Manager*.
- **Log Transfer Language** – the proprietary protocol used between Replication Agent and Replication Server to replicate data from the primary database to Replication Server. See also *Log Reader* and *Log Transfer Interface*.
- **Log Transfer Manager** – an internal component of 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 replicate database that Replication Server uses to apply replicated transactions to the database. See also *replicate database* and *Replication Server*.
- **materialization** – the process of copying the data from a primary database to a replicate database, initializing the replicate database so that the replication system can begin replicating transactions. See also *atomic materialization*, *bulk materialization*, and *nonatomic materialization*.
- **Multi-Path Replication**™ – Replication Server feature that improves performance by enabling parallel paths of data from the source database to the target database. These multiple paths process data independently and are applicable when sets of data can be processed in parallel without transactional consistency requirements between them.
- **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 replicate 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 *client*, *data server*, and *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 replicate database. See also *inbound queue*, *replicate database*, and *stable queue*.
- **primary data** – the data source used for replication. Primary data is stored and managed by the primary database. See also *primary database*.
- **primary database** – the database that contains the data to be replicated to another database (the replicate database) through a replication system. The primary database is the source of replicated data in a replication system. Sometimes called the active database. Contrast with *replicate database*. See also *primary data*.
- **primary key** – a column or set of columns that uniquely identifies 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 *replicate site*.
- **primary table** – a table used as a source for replication. Primary tables are defined in the primary database schema. See also *primary data* and *primary database*.
- **primary transaction** – a transaction that is committed in the primary database and recorded in the primary database transaction log. See also *primary database*, *replicated transaction*, and *transaction log*.
- **quiesce** – to cause a system to go into a state in which further data changes are not allowed. See also *quiescent*.
- **quiescent** – in a replication system, a state in which all updates have been propagated to their destinations. Some Replication Agent and Replication Server commands require that you first quiesce the replication system.

  In a database, a state in which all data updates are suspended so that transactions cannot change any data, and the data and log devices are stable.

  This term is interchangeable with quiesced and in quiesce. See also *quiesce*.
- **RASD** – an abbreviation for 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. See also *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. Compare with *database*. See also *SQL*.
- **replicate data** – A set of data that is replicated from a primary database to a replicate database by a replication system. See also *primary database*, *replication system*, and *replicate database*.
- **replicate database** – a database that contains data replicated from another database (the primary database) through a replication system. The replicate database is the database that

receives replicated data in a replication system. Contrast with *primary database*. See also *replicate data*, *replicated transaction*, and *replication system*.

- **replicated transaction** – a primary transaction that is replicated from a primary database to a replicate database by a transaction replication system. See also *primary database*, *primary transaction*, *replicate database*, and *transaction replication*.

- **replicate site** – the location or facility at which replicate data servers and replicate databases are deployed to support normal business operations during scheduled downtime at the primary site. Contrast with *primary site*. See also *replicate database*.

- **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 replicate 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** – a Sybase software product that provides the infrastructure for a transaction replication system. See also *Replication Agent*.

- **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 *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*.

- **route** – A one-way message stream from a primary Replication Server to a replicate Replication Server. Routes carry data-changing commands (including those for RSSDs) and replicated functions (database procedures) between separate Replication Servers. See also *Replication Server*.

- **RSSD** – an abbreviation for Replication Server System Database, which manages replication system information for a Replication Server. See also *Replication Server*.

- **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 replicate 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*.

- **stored procedure** – a data server object that represents an operation or set of operations. This term is often used interchangeably with *function*.

- **subscription** – a request for Replication Server to maintain a replicated copy of a table, or a set of rows from a table, in a replicate database at a specified location. See also *replicate database*, *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*.
- **transactional consistency** – A condition in which all transactions in the primary database are applied in the replicate database, and in the same order that they were applied in the primary database.
- **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 to a replicate database. See also *data replication*.
- **UDB** – IBM DB2 Universal Database (formerly IBM DB2 for Linux, UNIX, and Windows).
- **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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