Getting Started with Evaluation of SAP Replication Server Premium Edition
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1 Conventions

These style and syntax conventions are used in SAP documentation.

Style Conventions

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

An explanation for a placeholder (system- or setup-specific values) follows in text. For example:

Run the following, where <installation directory> is the location where the program is installed:

```<installation directory>/start.bat```

Syntax Conventions

<table>
<thead>
<tr>
<th>Key</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>{}</td>
<td>Curly braces indicate that you must choose at least one of the enclosed options. Do not type the braces when you enter the command.</td>
</tr>
<tr>
<td>[]</td>
<td>Brackets mean that choosing one or more of the enclosed options is optional. Do not type the brackets when you enter the command.</td>
</tr>
<tr>
<td>Key</td>
<td>Definition</td>
</tr>
<tr>
<td>-----</td>
<td>------------</td>
</tr>
<tr>
<td>()</td>
<td>Parentheses are to be typed as part of the command.</td>
</tr>
<tr>
<td></td>
<td>The vertical bar means you choose only one of the options shown.</td>
</tr>
<tr>
<td>,</td>
<td>The comma means you choose as many of the options shown as you like, separating your choices with commas that you type as part of the command.</td>
</tr>
<tr>
<td>...</td>
<td>An ellipsis (three dots) means you may repeat the last unit as many times as you need. Do not include ellipses in the command.</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>Angled brackets are not part of the syntax. Rather, they denote variables within the syntax. For example, if the syntax calls for a variable such as a password, this is denoted as &lt;password&gt;. However, when using the syntax in a command or query, omit the angled brackets. So, instead of using &lt;MyPassword&gt; use MyPassword.</td>
</tr>
</tbody>
</table>

**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 quote characters. For example: pdb_get_tables "<TableName>"
- Identifiers and character data may be case-sensitive, depending on the sort order that is in effect.
  - If you are using a case-sensitive sort order, such as “binary,” you must enter identifiers and character data with the correct combination of uppercase and lowercase letters.
  - If you are using a sort order that is not case-sensitive, such as “nocase,” you may enter identifiers and character data with any combination of uppercase or lowercase letters.

**Terminology**

SAP Replication Server works with various components to enable replication between supported database such as, SAP Adaptive Server Enterprise (SAP ASE), SAP HANA database, SAP IQ, Oracle, IBM DB2 UDB, and Microsoft SQL Server. SAP Replication Server uses SAP ASE for its Replication Server System Database (RSSD) or it uses SAP SQL Anywhere for its embedded Replication Server System Database (ERSSD).

Replication Agent is a generic term used to describe the Replication Agents for SAP ASE, SAP HANA database, Oracle, IBM DB2 UDB, and Microsoft SQL Server. The specific names are:
- RepAgent – Replication Agent thread for SAP ASE
- Replication Agent for Oracle
- Replication Agent for Microsoft SQL Server
- Replication Agent for UDB – for IBM DB2 on Linux, Unix, and Windows
- Replication Agent for DB2 for z/OS
About This Guide

Use SAP Replication Server to set up a basic replication system to replicate data from a primary data server to a replicate data server.

This guide provides end-to-end examples of the following tasks to get your replication system running:

- Installing SAP Replication Server
- Configuring and verifying the software installation
- Setting up a multisite availability system
- Replicating databases and tables from a primary to a replicate data server

Using This Guide

This guide assumes that you are familiar with SAP Adaptive Server Enterprise (SAP ASE) and have two SAP ASE databases; one that acts as the primary database (the source of changes to be replicated), and the second, which acts as the replicate database, where changes are applied. See SAP Adaptive Server Enterprise documentation for more information about SAP ASE.

When using the examples to set up your replication environment, note the following:

- Some directories, files, executable commands, examples, and screenshots are provided only for Linux; adjust them accordingly for Windows; and vice versa.
- Customize the values in the examples for your replication environment.
- Do not use words reserved for SAP Replication Server for object names and connection names, or all keywords and identifiers beginning with "rs_". See the Reserved Words in the Reference Manual.

Once your replication system is running, you can perform advanced configurations and tasks. See the following SAP Replication Server documentation:

- Installation guide for UNIX or Windows – describes requirements and installing SAP Replication Server in different modes.
- Configuration guide for UNIX or Windows – details several methods to configure SAP Replication Server, upgrade and downgrade, password encryption, and so on.
- Administration Guide – provides information about how to manage a replication system and its components, such as Replication Agent, database connections, replication routes, subscriptions, and warm standby applications.
- Reference Manual – details usage of commands, stored procedures, system functions, system tables, and so on.
- Troubleshooting Guide – describes common errors and problems and corresponding solutions.
3 Replication System Overview

SAP Replication Server replicates and maintains data in a replication system. The following major components comprise a basic replication system.

Primary and Replicate Database

A primary database contains the data to be replicated to another database (the replicate database) through a replication system, and is the source of replicated data in a replication system.

The replicate database receives replicated data from the primary database.

In this guide, you replicate data from a primary SAP ASE database to a replicate SAP ASE database.

SAP Replication Server

An SAP Replication Server manages one or more databases. While a single SAP Replication Server instance is adequate for some replication systems, others require an SAP Replication Server at each geographic site to manage all of the databases at that site. Still others require multiple SAP Replication Servers at each site to handle many databases or heavy transaction volumes.

This guide uses one SAP Replication Server for the replication system.

Replication Server System Database

Replication system data is stored in a dedicated SAP ASE database called the Replication Server System Database (RSSD), or in an embedded Replication Server System Database (ERSSD) using SAP SQL Anywhere.

This guide uses ERSSD, which is automatically created, configured, and maintained by SAP Replication Server.

ID Server

The ID Server is an SAP Replication Server that registers all SAP Replication Server instances and databases in the replication system. In addition to the usual SAP Replication Server tasks, the SAP Replication Server acting as the ID Server assigns a unique ID number to every SAP Replication Server and database in the replication system. The ID Server also maintains version information for the replication system. The ID Server is the first SAP Replication Server that you install and start when you install a replication system.
The examples in this guide use only one SAP Replication Server. Therefore, it is also the ID Server.

**Replication Agent**

A Replication Agent retrieves transactions from a database log and passes them to the replication system through the SAP Replication Server that manages the database. You can configure multiple replication paths from an SAP ASE database with an SAP ASE Replication Agent (RepAgent) for each replication path. For non-SAP databases, there is only one Replication Agent per database.

A user database and an RSSD might need a Replication Agent when replicating data. Replication Agent for ERSSD is managed by SAP Replication Server, and is automatically started when a route is created. You need not decide the ERSSD Replication Agent requirements while you install or configure SAP Replication Server.

This guide uses the RepAgent thread in an SAP ASE database.
4 Installing and Creating SAP Replication Server

Install the SAP Replication Server software and then create an instance to set up your replication system.

Related Information

- Pre-Installation Tasks [page 8]
- Installing SAP Replication Server [page 13]
- Adding Server Entries to the Interfaces File [page 22]
- Creating an SAP Replication Server Instance [page 24]
- Verifying the Configuration [page 37]
- Obtaining and Deploying an Evaluation License [page 38]

4.1 Pre-Installation Tasks

Complete the following tasks before installing SAP Replication Server.

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet system requirements</td>
<td>Make sure TCP/IP connectivity is available and the target computer on which you are installing the replication components meets the minimum memory and disk space requirements. See System Requirements [page 9].</td>
</tr>
<tr>
<td>Identify the installation directory</td>
<td>The SAP SYBASE environment variable identifies the installation path for installing SAP Replication Server. Select a path on a host drive to be the recipient of the installation and configuration activities. For example: /software/sybase.</td>
</tr>
<tr>
<td>Create the user account</td>
<td>See Creating the Sybase User Account [page 13].</td>
</tr>
</tbody>
</table>
Related Information

System Requirements [page 9]
Downloading an Evaluation of SAP Replication Server Premium Edition [page 12]
Creating the Sybase User Account [page 13]

4.1.1 System Requirements

Before installing SAP Replication Server, ensure that your system is updated with the latest patches and system requirements. Do not use a patch that is earlier than the version suggested for your operating system. Use the patch recommended by the operating system vendor or check the latest release bulletins.

Linux

Table 2: System Requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAM</td>
<td>A minimum of 4 GB RAM.</td>
</tr>
<tr>
<td>Disk storage</td>
<td>For a full installation, the total disk space required is approximately 2.5 GB.</td>
</tr>
<tr>
<td></td>
<td>Disk space required:</td>
</tr>
<tr>
<td></td>
<td>• 950 MB for the software, supporting files, and log files.</td>
</tr>
<tr>
<td></td>
<td>• (Optional) A minimum of 700 MB if you are installing SAP Replication Server Data Assurance (DA) Option.</td>
</tr>
<tr>
<td></td>
<td>• An additional 20 MB for each SAP Replication Server disk partition. The disk partition may be on a different disk than your software.</td>
</tr>
<tr>
<td></td>
<td>One of:</td>
</tr>
<tr>
<td></td>
<td>• Disk space for your SAP ASE database, which serves as your Replication Server System Database (RSSD) if you are not using the Embedded RSSD (ERSSD). See your SAP ASE documentation for system requirements.</td>
</tr>
<tr>
<td></td>
<td>• 80 MB for your SAP SQL Anywhere database, which serves as your ERSSD. The database directory, transaction log directory, and backup directory that make up the 80 MB should each reside on different disks.</td>
</tr>
<tr>
<td></td>
<td>More disk space may be required depending on your replication system application.</td>
</tr>
<tr>
<td>Supported protocols</td>
<td>TCP/IP</td>
</tr>
</tbody>
</table>
Table 3: Platform and OS Support

<table>
<thead>
<tr>
<th>Platform</th>
<th>Supported Operating Systems and Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux x86-64 (64-bit)</td>
<td>- Red Hat Enterprise Linux 6.5&lt;br&gt;  - Red Hat Enterprise Linux 6.6&lt;br&gt;  - Red Hat Enterprise Linux 7.0&lt;br&gt;  - SuSE Linux Enterprise Server SLES 11.1&lt;br&gt;  - SuSE Linux Enterprise Server SLES 11.2&lt;br&gt;  - SuSE Linux Enterprise Server SLES 11.3&lt;br&gt;  - SuSE Linux Enterprise Server SLES 12.0&lt;br&gt;  - SuSE Linux Enterprise Server SLES 12.1</td>
</tr>
<tr>
<td>Linux on IBM p-Series</td>
<td></td>
</tr>
<tr>
<td>(Linux on POWER) (64-bit)</td>
<td>- Red Hat Enterprise Linux 6.5&lt;br&gt;  - Red Hat Enterprise Linux 6.6&lt;br&gt;  - Red Hat Enterprise Linux 7.0&lt;br&gt;  - SuSE Linux Enterprise Server SLES 11.1&lt;br&gt;  - SuSE Linux Enterprise Server SLES 11.2&lt;br&gt;  - SuSE Linux Enterprise Server SLES 11.3</td>
</tr>
</tbody>
</table>

Important Note
ExpressConnect for SAP HANA database is not supported on Linux on IBM p-Series.

Before you install SAP Replication Server, install the runtime libraries for the IBM XL C compiler. To verify that IBM XL C runtime packages are installed, issue:

```
vacpp.rte-10.1.0-0
```

If the message is "package vacpp.rte-10.1.0-0 is not installed", download the IBM XL C version 10.1 runtime executables from the IBM Web site at [https://www-304.ibm.com/support/docview.wss?uid=swg24021253](https://www-304.ibm.com/support/docview.wss?uid=swg24021253). Make sure you select the appropriate installation package for your operating systems from the download table.

If your operating system requires patches, install them before you install SAP Replication Server components.

Issue the following command to list all currently installed patches and display the operating system version level:

```
rpm -q -a
```

Linux distributors that supply Linux Kernel version 2.4.<xxx> should provide all the libraries you require. If you are alerted to any outdated or missing libraries, download them from your Linux distributor’s Web site.

Windows

Table 4: System Requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>A Pentium processor.</td>
</tr>
<tr>
<td>Item</td>
<td>Requirement</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>RAM</td>
<td>A minimum of 4 GB RAM.</td>
</tr>
<tr>
<td>Disk storage</td>
<td>For a full installation, the total disk space required is approximately 1 GB. Disk space required:</td>
</tr>
<tr>
<td></td>
<td>• 800 MB for the software, supporting files, and log files.</td>
</tr>
<tr>
<td></td>
<td>• (Optional) At least 1 GB if you are installing SAP Replication Server Data Assurance (DA) Option.</td>
</tr>
<tr>
<td></td>
<td>• 20 MB for each SAP Replication Server disk partition. The disk partition may be on a different disk than your software.</td>
</tr>
<tr>
<td></td>
<td>➤ Tip</td>
</tr>
<tr>
<td></td>
<td>For the best performance, install the partitions on fast file systems or operating system raw devices.</td>
</tr>
<tr>
<td></td>
<td>• 30 MB for temporary usage during installation.</td>
</tr>
<tr>
<td></td>
<td>One of:</td>
</tr>
<tr>
<td></td>
<td>• Disk space for your SAP ASE database, which serves as your Replication Server System Database (RSSD) if you are not using the Embedded RSSD (ERSSD). See your SAP ASE documentation for system requirements.</td>
</tr>
<tr>
<td></td>
<td>• 80 MB for your SAP SQL Anywhere database, which serves as your ERSSD. The database directory, transaction log directory, and backup directory that make up the 80 MB should each reside on different disks.</td>
</tr>
<tr>
<td></td>
<td>More disk space may be required, depending on your replication system application.</td>
</tr>
<tr>
<td>Additional hardware</td>
<td>A minimum of 32-bit network card for better performance.</td>
</tr>
<tr>
<td>Supported protocols</td>
<td>TCP/IP, IPX/SPX, Microsoft Named Pipes.</td>
</tr>
</tbody>
</table>
Table 5: Platform and Supported Versions

<table>
<thead>
<tr>
<th>Platform</th>
<th>Supported Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Windows (32-bit and 64-bit):</td>
<td>One of:</td>
</tr>
<tr>
<td></td>
<td>● Windows Server 2008 R2 – Service Pack 1</td>
</tr>
<tr>
<td></td>
<td>● Windows 2012 R2</td>
</tr>
<tr>
<td></td>
<td>● Windows 8.1</td>
</tr>
<tr>
<td></td>
<td>● Windows 7 – Service Pack 1</td>
</tr>
<tr>
<td></td>
<td>If you are installing the software on Windows 64-bit, download and install the latest security updates from the Microsoft Web site.</td>
</tr>
<tr>
<td></td>
<td>Before you start the installation, install both Microsoft Visual Studio patches for your x86 or x64 Windows platform, download:</td>
</tr>
</tbody>
</table>

If your operating system requires a service pack, install it before you install SAP Replication Server. Contact your operating system representative for a complete list of service packs.

Choose either method to determine the current service pack system level and build number:

- Click Start > Control Panel > System
- Click Start > Run and enter winver.

**4.1.2 Downloading an Evaluation of SAP Replication Server Premium Edition**

Download an evaluation of SAP Replication Server Premium Edition from the SAP Community network.

**Procedure**

1. Navigate to SAP Adaptive Server Enterprise Community.
4. Enter your region, name, e-mail address, position, and company name on the right of the page.
5. Select the checkboxes to accept the Developer License Agreement and to acknowledge that you reviewed the SAP Privacy Statement.
6. Click Download the software to submit your information.
7. On the post-registration page, click For Linux or For Windows to download an installation image of SAP Replication Server Premium Edition.
8. Save the installation image to your machine as prompted by your browser.

### 4.1.3 Creating the Sybase User Account

Create a "sybase" user account to ensure that Sybase product files and directories are created with consistent ownership and privileges.

**Context**

A user, such as the sybase system administrator, who has read, write, and execute privileges, must perform all installation and configuration tasks. For Windows, the user must have the administrator privilege.

**Procedure**

1. Choose an existing account, or create a new account and assign a user ID, group ID, and password to serve as the "sybase" user account.
   - See your operating system documentation for instructions on creating a new user account.
   - If you have already installed other Sybase software, the "sybase" user already exists.
2. Verify that you can log in to the machine using this account.

### 4.2 Installing SAP Replication Server

The installer creates a target directory and installs the selected components into that directory.

**Prerequisites**

- Download and extract the SAP Replication Server installation image from the SAP Community network.
- Verify that the drive on which you install SAP Replication Server has enough disk space for the components being installed, and at least 1 GB of extra disk space for the installation program.

**Procedure**

1. Go to the directory where you extracted the installation image and start the installer:
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| UNIX   | Enter: 
  
  ./setup.bin  
  
  setup.bin is the name of the executable file name for installing SAP Replication Server. |
| Windows| Double-click setup.exe. |

2. In the Introduction window, click Next.

3. Specify where to install the SAP Replication Server.
If the directory you choose does not exist, click Yes to create it.

If the directory you choose exists but already contains an installation of Replication Server, the installer warns you that it will overwrite the older version. Click Next.

The installer checks whether the version you want to update is compatible with the version of SAP Replication Server you are installing. If not, the Check Upgrade Incompatible Version dialog appears, and you see this:

Warning: The current "SAP Replication Server" in your destination directory is not compatible with this version upgrade; some bug fixes may be unavailable if you proceed. See the release note for more information.
You may see a message similar to the following if your SAP Replication Server is an out-of-band release, such as an emergency bug fix, one-off, controlled, or instrumental release:

Warning: The current "SAP Replication Server" in your destination directory is an out-of-band release; some bug fixes may be unavailable if you proceed. Verify that the bug fixes you need are in this newer version before proceeding with the upgrade.

If you see such messages, click **Cancel** to stop the installation process. To override the error and continue with the installation, select **Proceed installation with incompatible version**, then click **Next**.

**Caution**

Upgrading to an incompatible version may cause software regression. You should cancel the installation and obtain a compatible version of SAP Replication Server.

If you perform the installation in silent or unattended mode and the versions are incompatible, the installer prompts you to re-run the installer with this argument, then quits:

```
DALLOW_UPGRADE_TO_INCOMPATIBLE_VERSION=true
```

4. Select the type of installation, then click **Next**.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical</td>
<td>Installs the default components. This is recommended for most users.</td>
</tr>
<tr>
<td>Full</td>
<td>Installs every component, including all the supported language modules.</td>
</tr>
<tr>
<td>Custom</td>
<td>Lets you select the components to install. Some components are automatically installed if they are required to run your selected components.</td>
</tr>
</tbody>
</table>

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

6. In the SySAM License Server window, select **Continue installation without a license key**, then click **Next**.
The installer allows you to install and use the components without a license for a grace period of 90 days. To continue using these components after the end of the grace period, follow the instructions in Obtaining and Deploying an Evaluation License [page 38] to generate a temporary license key good for one year from the date it was generated.

7. (Optional) Set SySAM e-mail configuration. Click Next. The installation summary window displays your selections.
8. Review the selections you made in the installation summary window, then click **Install**.

9. Choose whether to configure and start a sample Replication Server now or later by selecting one of the following, then click **Next**.
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| Yes    | Configure and start a sample Replication Server. The installer displays the configuration information for the sample Replication Server. Record this information. The installer prompts you for a password:  
  - Single-byte characters – enter a password 6 to 30 characters long.  
  - Double-byte characters – enter a password 3 to 15 characters long. |
| No     | Manually configure a full-featured SAP Replication Server and start a sample Replication Server after installation. The installer prompts you to select one of the following:  
  - Yes – create a sample Replication Server directory without starting the sample Replication Server  
  - No – continue with the installation |

**Note**

The sample Replication Server does not run on Linux on POWER because the ERSSD requires an SAP SQL Anywhere server, which is not available on Linux on POWER.

10. Click **Done**.
11. Check that the date of the `si_reg.xml` file in the `Sybase_Install_Registry` directory reflects the date of the current installation.

Results

The SAP Replication Server software is installed successfully.
4.3 Adding Server Entries to the Interfaces File

Before creating an SAP Replication Server instance, use the dsedit utility to add entries for SAP Replication Server and the ERSSD in the interfaces file.

Context

An interfaces file contains entries for each SAP Replication Server and data server in a replication system. The entry for each server includes its unique name and the network information that other servers and client programs need to connect with it. The interfaces file is located in $SYBASE/interfaces (%SYBASE\ini \sql.ini in Windows).

When you install SAP Replication Server in an existing SAP $SYBASE (%SYBASE% in Windows) installation directory, the installer adds SAP Replication Server information to the existing interfaces file. When you install SAP Replication Server in a unique installation directory, the installer creates a new interfaces file, resulting in two interfaces files: one for your existing SAP applications, and a second for SAP Replication Server.

For each server, provide a server name, a host name, and a port number. In this example, you need to add one entry for the SAP Replication Server instance and one for the ERSSD.

Procedure

1. Navigate to the $SYBASE directory.
2. Set the SYBASE environment variables.
   For UNIX, source the SYBASE.csh file. For Windows, run the SYBASE.bat file.
3. Navigate to $SYBASE/OCS-<version>/bin (%SYBASE\OCS-<version>\bin in Windows).
4. Start the dsedit utility:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIX</td>
<td>Enter:</td>
</tr>
<tr>
<td></td>
<td>dsedit</td>
</tr>
<tr>
<td>Windows</td>
<td>Double-click dsedit.exe</td>
</tr>
</tbody>
</table>

The following steps are based on Windows. The corresponding steps in UNIX might differ from the following.
5. Select InterfacesDriver, then click OK.
6. Select **Server Object** ▶ **Add** ▶

7. Enter the name of the SAP Replication Server instance, for example, **PRS**, then click **OK**.

8. Double-click the value field for **Server Address** to add the address for the primary data server.

9. In the **Network Address Attribute** dialog box, click **Add**.
10. Enter the host name and port number of the SAP Replication Server instance, for example, chaucer, 17051, then click OK.

11. Repeat the process to add an entry for the ERSSD.

12. Select File Exit to exit dsedit.

### 4.4 Creating an SAP Replication Server Instance

Use the `rs_init` tool to create an SAP Replication Server instance.

You can use `rs_init` in interactive mode or with a resource file. This guide shows you how to use `rs_init` to create an SAP Replication Server instance in both methods.
4.4.1 Creating an SAP Replication Server Instance with a Resource File

Create an SAP Replication Server instance using the rs_init tool with a resource file.

Prerequisites

- Allocate a disk partition of at least 20 MB for each SAP Replication Server you are installing. You may add more partitions later.
- Ensure that the raw device or file system is available and has write permissions. If using a raw device, allocate the entire partition to the SAP Replication Server. You may add more space for the stable device later. If you allocate only a part of the partition to SAP Replication Server, you cannot use the remainder for any other purpose.

Context

A resource file is an ASCII-formatted file that contains configuration information for rs_init. Instead of entering configuration variables during an interactive rs_init session, use a text editor to edit the resource file to specify the variables, then specify the resource file name on the rs_init command line.

This example creates a single SAP Replication Server, which has an embedded Replication Server System Database (ERSSD). The name of the SAP Replication Server is "PRS".

Procedure

1. Go to the $SYBASE directory (%SYBASE% in Windows).
2. Add the SAP Replication Server instance and the ERSSD database to the interfaces file used by SAP Replication Server.
3. Set the environment variables by sourcing the SYBASE.csh file in UNIX or executing SYBASE.bat in Windows.
4. Go to $SYBASE/REP-15_5/init/rs (%SYBASE\REP-15_5\init\rs in Windows).
5. Make a copy of the install.rs file and rename it "PRS.rs".
6. Modify the parameter values in PRS.rs file as described in the following table.

See the table for description of the parameters that do not have values in the resource file and provide their values based on the description.

Table 6: Example Values for PRS.rs File

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>sybinit.release_directory</td>
<td>The valid path where the SAP Replication Server instance is created ($SYBASE in UNIX and %SYBASE% in Windows).</td>
<td>/opt/sybase (c:sybase in Windows)</td>
</tr>
<tr>
<td>rs.rs_idserver_name</td>
<td>The name of the ID server. In this example, enter PRS because the SAP Replication Server instance you are creating is also the ID server.</td>
<td>PRS</td>
</tr>
<tr>
<td>rs.rs_id_server_is_rs_server</td>
<td>Specifies whether the SAP Replication Server being created is the ID server or not. In this example, specify yes.</td>
<td>yes</td>
</tr>
<tr>
<td>rs.rs_idserver_user</td>
<td>Creates a name that other SAP Replication Servers use to connect to the ID server. The default name is the name of the SAP Replication Server, followed by &quot;_id_user&quot;. If you are creating an SAP Replication Server that is not the ID server, specify the name of the ID server identified in the parameter rs.rs_idserver_name.</td>
<td>PRS_id_user</td>
</tr>
<tr>
<td>rs.rs_idserver_pass</td>
<td>The password of the ID server user.</td>
<td>&lt;password&gt;</td>
</tr>
<tr>
<td>rs.rs_name</td>
<td>The name of the SAP Replication Server instance.</td>
<td>PRS</td>
</tr>
<tr>
<td>rs.rs_rs_sa_pass</td>
<td>The password for the &quot;sa&quot; user ID.</td>
<td>&lt;password&gt;</td>
</tr>
<tr>
<td>rs.rs_needs_repagent</td>
<td>Specifies whether the RSSD needs a RepAgent. Required when multiple replication servers are used to replicate data from the primary to the replicate. If the primary database and the replicate database will be replicating through multiple SAP Replication Servers, enter yes. For this example, specify no.</td>
<td>no</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Values</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>rs.rs_rssd_embedded</td>
<td>Specifies whether to use an embedded replication server system database (ERSSD) or an RSSD on an SAP ASE database. For this example, specify yes.</td>
<td>yes</td>
</tr>
<tr>
<td>rs.rs_erssd_name</td>
<td>The name of the ERSSD database.</td>
<td>PRS_ERSSD</td>
</tr>
<tr>
<td>rs.rs_erssd_database_dir</td>
<td>The path where the ERSSD database is located.</td>
<td>/opt/sybase/REP-15_5/database(c:\sybase\REP-15_5\database in Windows)</td>
</tr>
<tr>
<td>rs.rs_erssd_translog_dir</td>
<td>The path where the ERSSD database transaction logs are located.</td>
<td>/opt/sybase/REP-15_5/translog(c:\sybase\REP-15_5\translog in Windows)</td>
</tr>
<tr>
<td>rs.rs_erssd_backup_dir</td>
<td>The path where the ERSSD backups, including the mirror log, are located.</td>
<td>/opt/sybase/REP-15_5/backup(c:\sybase\REP-15_5\backup in Windows)</td>
</tr>
<tr>
<td>rs.rs_erssd_errorlog_dir</td>
<td>The path where the ERSSD error logs are located.</td>
<td>/opt/sybase/REP-15_5/errorlog(c:\sybase\REP-15_5\errorlog in Windows)</td>
</tr>
<tr>
<td>rs.rs_rssd_prim_user</td>
<td>The login name that the SAP Replication Server uses to log in to the ERSSD for system table updates.</td>
<td>PRS_RSSD_prim</td>
</tr>
<tr>
<td>rs.rs_rssd_prim_pass</td>
<td>The password of the login entered in the rs.rs_rssd_prim_user parameter.</td>
<td>&lt;password&gt;</td>
</tr>
<tr>
<td>rs.rs_rssd_maint_user</td>
<td>The login name that the SAP Replication Server uses to log in to the ERSSD when getting work from other SAP Replication Servers.</td>
<td>PRS_RSSD_maint</td>
</tr>
<tr>
<td>rs.rs_rssd_maint_pass</td>
<td>The password of the login entered in the rs.rs_rssd_maint_user parameter.</td>
<td>&lt;password&gt;</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Values</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>rs.rs_diskp_name</td>
<td>The existing path and raw device (or file name) for the SAP Replication Server stable device. SAP Replication Server uses disk partitions for stable queues, which temporarily store the data it receives and sends.</td>
<td>/opt/sybase/PRSpart1.dat (c:\sybase\PRSpart1.dat in Windows)</td>
</tr>
<tr>
<td>rs.rs_diskp_lname</td>
<td>The logical name of the stable device partition. This name is used in commands and in SAP Replication Server messages to identify the disk partition.</td>
<td>part1</td>
</tr>
<tr>
<td>rs.rs_diskp_size</td>
<td>The size, in megabytes, of the stable device partition. The minimum size is 20 MB.</td>
<td>20</td>
</tr>
<tr>
<td>rs.rs_rs_user</td>
<td>The login name that other SAP Replication Server instances can use to connect to this SAP Replication Server. The default name is the name of SAP Replication Server followed by _rsi. For this example, PRS_rsi.</td>
<td>PRS_rsi</td>
</tr>
<tr>
<td>rs.rs_rs_pass</td>
<td>The password of the login entered in the rs.rs_rs_user parameter.</td>
<td>&lt;password&gt;</td>
</tr>
<tr>
<td>rs.rs_ltm_rs_user</td>
<td>The login name that Replication Agents use to log in to the SAP Replication Server. The default name is the name of the SAP Replication Server followed by _ra. For this example, PRS_ra.</td>
<td>PRS_ra</td>
</tr>
<tr>
<td>rs.rs_ltm_rs_pass</td>
<td>The password of the login entered in the rs.rs_ltm_ls_user parameter.</td>
<td>&lt;password&gt;</td>
</tr>
</tbody>
</table>

7. Save the file.
8. Go to the $SYBASE/REP-15_5/install directory (%SYBASE%\REP-15_5\install in Windows).
9. Create the SAP Replication Server:

    ./rs_init -r ../init/rs/PRS.rs

**Note**

If the rs_init command does not complete, check the log file in $SYBASE/$SYBASE_REP/init/log (%SYBASE%\%SYBASE_REP%\init\log in Windows), correct the error, and resubmit the rs_init.
4.4.2 Creating an SAP Replication Server Instance in Interactive Mode

Create an SAP Replication Server instance using `rs_init` in interactive mode.

**Context**

`rs_init` in interactive mode provides command keys and menu prompts to help you make selections and move between windows. It also rejects invalid entries and displays warnings or error messages when you make improper selections. If you make a mistake, change your entry and continue with the installation session.

This example demonstrates how to use `rs_init` in interactive mode to create SAP Replication Server in Windows. See [*Replication Server Configuration Guide for UNIX*](#) for how to create SAP Replication Server in interactive mode in UNIX.

**Procedure**

1. Log in to your machine using the replication system administrator account.
2. Start `rs_init`.
3. In the RS_INIT window, select **Configure a Server Product**, then click **Continue**.

   ![RS_INIT Window]

4. Select **Replication Server**, then click **Continue**.
5. Select **Install a new Replication Server**, then click **Continue**.

In the New Replication Server window, configure all options for the new SAP Replication Server. Choose a configuration option in any order, then click **Continue** to move on to configure that particular option.
6. Select **Replication Server Information**, then click **Continue** to complete the following information:

   a. Enter a name for the SAP Replication Server, then click **Continue**.

   ![Replication Server Information](image)

   **REPLICATION SERVER NAME**

   Replication Server Name: [PRSI]

   ![Replication Server Name](image)

   b. In the Replication Server Information window, provide the following:
Click **Yes** to set this Replication Server as the ID Server.

- Accept the default fields for Replication Server error log and configuration file or enter new values.
- Set a password for the SAP Replication Server "sa" user.
- If the status of Replication Server Interfaces Information is "Incomplete", follow the instructions in [Adding Server Entries to the Interfaces File](#) to add an entry for the SAP Replication Server to the interfaces file.
- You can leave the other options as is, and click **Continue** to save the information and return to the New Replication Server window. The status of Replication Server Information is now "Complete".

7. Select **ID Server Information**, then click **Continue**.
a. Enter a name for ID Server User. Other SAP Replication Server instances in the replication system use this login name to connect to the ID Server.

b. Set a password for the ID Server user.

c. Click **Continue** to save the information and return to the New Replication Server window. The status of ID Server Information is now "Complete".

8. Select **Replication Server System Database**, then click **Continue** to complete the following information:

   a. In the Replication Server System Database Choice window, select **Yes**.

      The text on the second line changes to:
      Embedded Replication Server Database Incomplete.

      Select it, then click **Continue**.

b. Enter a name for the ERSSD, then click **Continue**.
c. In the Embedded Replication Server System Database window, accept the default values for the ERSSD database directory, transaction log directory, backup directory, and error log directory, or provide your own values.

d. If the status of ERSSD Interfaces Information is "Incomplete", add an entry for the ERSSD to the interfaces file.

e. Accept the default login name for the RSSD primary user or enter a different one. SAP Replication Server uses this login name for system table updates.

f. Set a password for the primary user.

g. Accept the default login name for the RSSD maintenance user or enter a different one. SAP Replication Server uses this login name to perform operations on the system tables that are replicated from other sites.

h. Set a password for the maintenance user.

i. Click Continue twice to save the information and return to the New Replication Server window. The status of the Replication Server System Database is now "Complete".

9. Select Disk Partition, then click Continue.
a. Enter a disk partition path. You can enter a full path of an operating system file or the name of a physical disk device.

![Disk Partition Information](image)

b. Enter a logical name for the disk partition to use in commands and system messages.

c. Click **Continue** to save the information and return to the New Replication Server window. The status of Disk Partition is now "Complete".

10. Select **Remote Site Connections**, then click **Continue**.

   a. Accept the default login name for other SAP Replication Server instances to log in to the SAP Replication Server or enter a different one.

![Remote Site Connections](image)

   b. Set a password for this user account.

   c. Click **Continue** to save the information, then return to the New Replication Server window. The status of Remote Site Connections is now "Complete".

11. Select **Database Replication Agent**, then click **Continue**.

   a. Accept the default user name for Replication Agent to access the SAP Replication Server or enter a new one.
b. Set a password for this user account.
c. Click **Continue** to save the information, then return to the New Replication Server window. The status of Database Replication Agent is now "Complete". All options in the New Replication Server window are now marked as "Complete".

12. Click **Continue** to submit the information, then click **Yes** to start creating the SAP Replication Server instance.

13. When the SAP Replication Server instance is created successfully, click **OK** in the Setup window.

14. Click **Exit** to close the Configure Replication System window.

**Results**

The SAP Replication Server instance named **PRS** is created and running successfully.
4.5 Verifying the Configuration

Verify that the SAP Replication Server installation directory and subdirectories (%SYBASE% on Windows and $SYBASE on UNIX) exist, and that other required software has been installed.

**Procedure**

1. Change to the directory where you installed SAP Replication Server.
2. Set the environment variables by sourcing the SYBASE.csh file in UNIX or executing SYBASE.bat in Windows.
3. Log in to SAP Replication Server, where **PRS** is the name of the SAP Replication Server:
   ```
   isql -Usa -P<password> -SPRS
   ```
   **Note**
   The default system administrator user ID is "sa". The password to the "sa" user ID is the value that was filled in the resource file for **rs.rs_rs_sa_pass**.
4. Run the **admin who** command:
   ```
   admin who
   go
   ```
   The output from the command looks similar to:
   ```
   Spid   Name         State             Info
   ------ -----       -----             -----------
   27     DSI EXEC     Awaiting Command
   101    DSI           Waiting Message 101:0 sunak1505i.PRS_RSSD
   26     SQM          Waiting Message 101:0 sunak1505i.PRS_RSSD
   21     dSUB         Sleeping
   18     dAIO         Waiting Message
   23     dREC         Sleeping           dREC
   9      dDELETE      Waiting Message
   28     USER         Active             sa
   14     dALARMS      Waiting Wakeup
   24     dSYSAM       Sleeping
   ```
5. Enter the **admin version** command to verify the SAP Replication Server version:
   ```
   admin version
   go
   ```
   The output from the command looks similar to:
   ```
   Version
   -----------------------------------------------
   Replication Server/15.7.1/P/Sun_svr4/OS 5.8.1/0OPT64/Sun
   Apr 22 18:37:00 2012
   ```
6. Exit the isql session:

    quit

### 4.6 Obtaining and Deploying an Evaluation License

If the evaluation of SAP Replication Server Premium Edition expires after its 90-day grace period, you can register online and generate a temporary license key good for one year from the date it was generated.

#### Procedure

1. Go to the MiniSAP site, select **SAP Replication Server Premium Edition** from the product list.
2. Enter your name, e-mail address, host machine ID, and host name.
   - The host ID is the ID of the machine on which SAP Replication Server is installed. For more information about host IDs, see [Determining Host IDs in the SySAM Users Guide](#).
3. Select the checkbox to view and agree to the terms of the License Agreement.
4. Click **Generate**.
   - The license key is generated.
5. Download the license key as prompted by your browser.
6. Place the license file as is in the `$SYBASE/SYSAM-2_0/licenses` directory (`%SYBASE%\SYSAM-2_0\licenses` in Windows).
7. Restart SAP Replication Server if it is running.
   - Navigate to the `$SYBASE` directory.
   - Set the SYBASE environment variables.
     - For Windows, run the `SYBASE.bat` file. For UNIX, source the `SYBASE.csh` file.
   - Log in with `isql` to connect to the SAP Replication Server.

    ```
    isql -Usa -P<sa_pass> -S<replication_server>
    ```

    where:
    - `sa` – is a user ID with sa privileges
    - `sa_pass` – is the password for the user
    - `replication_server` – is the name of the SAP Replication Server. Alternatively, use the hostname and port number separated with a colon, such as: "chaucer:17051"

    For example:

    ```
    isql -Usa -P<sa_pass> -SPRS
    ```

d. Shut down the SAP Replication Server:

    ```
    shutdown
    ```
e. Navigate to the %SYBASE%\REP-15_5\install directory in Windows, or $SYBASE/REP-15_5/install in UNIX.

f. For Windows, double-click the PRS.bat file to start the SAP Replication Server. For UNIX, run the RUN_PRS file.

Results

You have successfully deployed the evaluation license key for SAP Replication Server Premium Edition for one year of use.
5 Setting Up Replication

You can replicate an entire database or specific tables in a database from the primary data server to the replicate data server.

Related Information

Replicating a Database [page 40]
Replicating a Table [page 54]

5.1 Replicating a Database

Use multisite availability (MSA) to replicate databases.

MSA extends SAP Replication Server replication capabilities and simplifies setting up a replication system.

Key features of MSA include:

- A simple replication methodology that requires only one replication definition for the primary database and only one subscription for each subscribing database.
- A replication filtering strategy that lets you choose whether to replicate individual tables, transactions, functions, system stored procedures, and data definition language (DDL).
- Replication of DDL to any replicate database—including non-warm standby databases.
- Replication to multiple replicate sites—for standby as well as nonstandby databases.

The following diagram illustrates a simple example of MSA replication.

The example in this guide shows you how to replicate the pubs2 database from the sunak1502i primary data server to the sunak1505i replicate data server. However, you can substitute the replicate database hosted on a different server to a different database on the same server that hosts the primary database.
5.1.1 Adding Databases to the Replication System

To set up an MSA replication system, use the `rs_init` tool to add the primary and replicate databases to the system.

Whether you replicate an entire database or certain tables in the database, add the primary and replicate databases to the replication system by creating connections from the primary database to the SAP Replication Server, and from the SAP Replication Server to the replicate database.

You can use `rs_init` in interactive mode or with a resource file. The examples in this guide demonstrate how to add databases to the replication system using both methods.

Related Information

- Adding the Primary Database to the Replication System [page 41]
- Adding the Replicate Database to the Replication System [page 47]

5.1.1.1 Adding the Primary Database to the Replication System

Add a primary database to the replication system by creating a connection from the primary database to the SAP Replication Server.

Context

This example uses the `rs_init` tool in interactive mode to add the primary database in Windows. See *Replication Server Configuration Guide for UNIX* for how to add a database in interactive mode in UNIX.

The `pubs2` database used in this example is available in the standard SAP ASE installation. See *Installing Sample Databases* in the SAP Adaptive Server Enterprise installation guide for information on installing `pubs2` database.
Procedure

1. Follow the instructions in Adding Server Entries to the Interfaces File [page 22] to add server entries in the interfaces file:
   ○ An entry for SAP Replication Server in the interfaces file used by the SAP ASE server that hosts the primary database
   ○ An entry for the SAP ASE server in the interfaces file used by SAP Replication Server
2. Restart the SAP ASE server and SAP Replication Server after you save the interfaces file.
3. Start `rs_init`.
4. In the RS_INIT window, click **Configure a Server Product**, then **Continue**.

5. Click **Replication Server**, then **Continue**.

6. Select **Add a database to the replication system**, then click **Continue**.
In the Add Database to Replication System window, configure both Replication Server Information and Database Information options by selecting each and clicking **Continue**.

7. Select **Replication Server Information**, then click **Continue**.
   a. Enter the name of the SAP Replication Server, then click **Continue**.
   b. Enter the password of the SA user on SAP Replication Server.
c. If the status of Replication Server Interfaces Information is "Incomplete", follow the instructions in Adding Server Entries to the Interfaces File [page 22] to add an entry for the SAP Replication Server to the interfaces file.

d. Click **Continue** to save the information and return to the Add Database to Replication System window. The status of Replication Server Information is now "Complete".

8. Select **Database Information**, then click **Continue** to complete the following information:

   a. Enter the name of the data server that hosts the primary database.
   b. Enter the user ID that has "sa" privileges on the data server.
   c. Enter the password of the "sa" user to connect to the data server.
   d. Enter the name of the primary database.
   e. Select **Yes** for "Will the database be replicated".
f. Accept the default value for the maintenance user ID whose work is not replicated when logged in to
the primary database, or enter a new one.

If the user ID does not exist, the script creates the user ID on the database. The user ID cannot be the
name of an alias.

g. Set a password for the maintenance user.

h. Specify whether this is a warm standby database. For this example, select **No**.

i. Click **Continue** to save the information and return to the Add Database to Replication System window.
The status of Database Information is now “Complete”.

Because the database you add is the primary database, the Database Replication Agent option is added to the
main window.

<table>
<thead>
<tr>
<th>ADD DATABASE TO REPLICAATION SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replication Server Information</td>
</tr>
<tr>
<td>Database Information</td>
</tr>
<tr>
<td>Database Replication Agent</td>
</tr>
</tbody>
</table>

**9. Select Database Replication Agent**, then click **Continue**.

a. Enter the user ID that the Replication Agent uses to log in to the SAP Replication Server. This name
typically comes from the value of `rs.rs_ltm_rs_user` that was set up when you created the SAP
Replication Server.

<table>
<thead>
<tr>
<th>DATABASE REPLICAATION AGENT OR LTM</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS user:</td>
</tr>
<tr>
<td>RS password:</td>
</tr>
</tbody>
</table>

b. Enter the password for this user account.

c. Click **Continue** to save the information, then return to the Add Database to Replication System
window. The Database Replication Agent is now “Complete”.

All options in the Add Database to Replication System window are now marked as “Complete”.
10. Click **Continue** to submit the information, then click **Yes** to create a connection from the primary database to SAP Replication Server.

11. When the primary database is added successfully, click **OK** in the Setup window.

   If the task fails, check the log file in `%SYBASE%\%SYBASE_REP%\init\logs`, correct the issue, then disable the RepAgent as follows:
   
   a. Log in to the primary SAP ASE using an “sa” user role and access the primary database.

   b. Disable the RepAgent thread in the primary database:

      ```
      sp_config_rep_agent pubs2,'disable'
      go
      ```

   c. Click **Continue** in the Add Database to Replication System window to re-create the connection from the primary database to the SAP Replication Server.

12. Click **Exit** to close the Add Database to Replication System window.

13. Log in to the SAP Replication Server to validate the primary connection:

    ```
    isql -Usa -P<password> -SPRS
    ```

14. Run the `admin who` command:

    ```
    admin who
    go
    ```

   The output from the command looks similar to:

<table>
<thead>
<tr>
<th>Spid</th>
<th>Name</th>
<th>State</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>DSI EXEC</td>
<td>Awaiting Command</td>
<td>102(1)sunak1502i.pubs2</td>
</tr>
<tr>
<td>33</td>
<td>DSI</td>
<td>Awaiting Message</td>
<td>102 sunak1502i.pubs2</td>
</tr>
<tr>
<td>35</td>
<td>DIST</td>
<td>Awaiting Wakeup</td>
<td>102 sunak1502i.pubs2</td>
</tr>
<tr>
<td>36</td>
<td>SQT</td>
<td>Awaiting Wakeup</td>
<td>102:1 DIST sunak1502i.pubs2</td>
</tr>
<tr>
<td>34</td>
<td>SQM</td>
<td>Awaiting Message</td>
<td>102:1 sunak1502i.pubs2</td>
</tr>
<tr>
<td>32</td>
<td>SQM</td>
<td>Awaiting Message</td>
<td>102:0 sunak1502i.pubs2</td>
</tr>
<tr>
<td>37</td>
<td>REP AGENT</td>
<td>Awaiting Command</td>
<td>sunak1502i.pubs2</td>
</tr>
<tr>
<td>39</td>
<td>NRM</td>
<td>Awaiting Message</td>
<td>sunak1502i.pubs2</td>
</tr>
<tr>
<td>27</td>
<td>DSI EXEC</td>
<td>Awaiting Command</td>
<td>101(1)sunak15051.PRS_RSSD</td>
</tr>
<tr>
<td>20</td>
<td>DSI</td>
<td>Awaiting Message</td>
<td>101 sunak15051.PRS_RSSD</td>
</tr>
<tr>
<td>26</td>
<td>SQM</td>
<td>Awaiting Message</td>
<td>101:0 sunak15051.PRS_RSSD</td>
</tr>
<tr>
<td>21</td>
<td>dSUB</td>
<td>Sleeping</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>dCM</td>
<td>Awaiting Message</td>
<td></td>
</tr>
</tbody>
</table>
5.1.1.2 Adding the Replicate Database to the Replication System

Use rs_init with a resource file to add a replicate database to the replication system by creating a connection from the SAP Replication Server to the replicate database.

Procedure

1. Add the replicate SAP ASE server to the interfaces file of the SAP Replication Server, then restart the SAP Replication Server after you save the interfaces file.
2. Go to $SYBASE/$SYBASE_REP/init/rs (%SYBASE%\%SYBASE_REP%\init\rs in Windows).
3. Make a copy of the setupdb.rs file and rename it to "replicate_pubs2.rs".
4. Modify the parameter values in the replicate_pubs2.rs file as described in the following table:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>sybinit.release_directory</td>
<td>The valid path of the SAP Replication Server software ($SYBASE in UNIX and %SYBASE% in Windows).</td>
<td>/opt/sybase (c:\sybase in Windows)</td>
</tr>
<tr>
<td>rs.rs_name</td>
<td>The name of the SAP Replication Server.</td>
<td>PRS</td>
</tr>
<tr>
<td>rs.rs_sa_user</td>
<td>The user ID that has “sa” privileges on SAP Replication Server.</td>
<td>sa</td>
</tr>
<tr>
<td>rs.rs_sa_pass</td>
<td>The password of the “sa” user.</td>
<td>&lt;password&gt;</td>
</tr>
<tr>
<td>rs.ds_name</td>
<td>The name of the data server that hosts the replicate database.</td>
<td>sunak1505i</td>
</tr>
<tr>
<td>rs.ds_sa_user</td>
<td>The user ID that has “sa” privileges on data server.</td>
<td>sa</td>
</tr>
<tr>
<td>rs.ds_sa_password</td>
<td>The password of the “sa” user for the data server.</td>
<td>&lt;password&gt;</td>
</tr>
<tr>
<td>rs.db_name</td>
<td>The name of the replicate database.</td>
<td>pubs2</td>
</tr>
</tbody>
</table>
### Parameter | Description | Value
---|---|---
rs.rs_needs_repagent | Specifies whether you plan to replicate from the specified rs.rs_db_name. | no
rs.rs_db_maint_user | The user ID for the maintenance user, who will apply the work at the replicate database. If the user ID does not exist, the script creates the user ID on the replicate database. The user ID cannot be the name of an alias. | pubs2_maint
rs.rs_db_maint_password | The password for the maintenance user. | <password>
rs.rs_db_physical_for_log | Specifies whether this is a warm standby database. | no

5. Save the file.

6. Go to `$SYBASE/$SYBASE_REP/install` (`%SYBASE%\%SYBASE_REP%\install` in Windows).

7. Create the connection from SAP Replication Server to the replicate database by running `rs_init`:

```
./rs_init -r ../init/rs/replicate_pubs2.rs
```

If the `rs_init` command fails, correct the issue, and re-run `rs_init`.

8. Validate the replicate connection:

```
isql -Usa -P<password> -SPRS
```

9. Enter:

```
admin who
go
```

The output from the command looks similar to:

```
Spid     Name       State                Info
-----   -------    ------------         -----------------
48      DSI EXEC   Awaiting Command     102(1) sunak1502i.pubs2
33      DSI        Awaiting Message     102 sunak1502i.pubs2
35      DIST       Awaiting Wakeup      102 sunak1502i.pubs2
36      SQT        Awaiting Wakeup      102:1 DIST sunak1502i.pubs2
34      SQM        Awaiting Message     102:1 sunak1502i.pubs2
32      SQM        Awaiting Message     102:0 sunak1502i.pubs2
37      REP AGENT  Awaiting Command     sunak1502i.pubs2
39      NRM        Awaiting Message     sunak1502i.pubs2
27      DSI EXEC   Awaiting Command     101(1) sunak1505i.PRS_RSSD
20      DSI        Awaiting Message     101 sunak1505i.PRS_RSSD
26      SQM        Awaiting Message     101:0 sunak1505i.PRS_RSSD
55      DSI EXEC   Awaiting Command     103(1) sunak1505i.pubs2
54      DSI        Awaiting Message     103 sunak1505i.pubs2
53      SQM        Awaiting Message     103:0 sunak1505i.pubs2
21      dSUB       Sleeping             dREC
15      dCM        Awaiting Message
18      dAIO       Awaiting Message
23      dREC       Sleeping
9       dDELESEG   Awaiting Message
```

---

**Getting Started with Evaluation of SAP Replication Server Premium Edition**

**Setting Up Replication**

---

**PUBLIC**
56      USER       Active               sa 
14      dALARM     Awaiting Wakeup 
24      dSYSAM     Sleeping 

10. Exit the isql session.

5.1.2 Marking the Primary Database for Replication

Use a database replication definition and subscription to replicate the entire primary database.

Procedure

1. Log in to the primary database with system administrator privileges:

   isql -Usa -P<password> -Ssunak1502i

2. Connect to the pubs2 database:

   use pubs2
   go

3. Mark the primary database for replication. For example:

   sp_reptostandby pubs2, 'all'
   go

4. Set the send warm standby xacts RepAgent parameter to true so that RepAgent sends data manipulation transactions (DML) and data definition language (DDL) to the replicate database. For example, at the primary data server, enter:

   sp_config_rep_agent
   pubs2,send_warm_standby_xacts,true
   go

   Parameter_Name Default_Value Config_Value Run_Value
   ------------- --------- ----------------- ---------
   send warm standby xacts false  true           false
   (1 row affected)
   RepAgent configuration changed for database pubs2. The changes will take effect the next time the RepAgent thread is started.
   (return status = 0)

5. Stop, then restart the RepAgent:

   sp_stop_rep_agent pubs2
   go
   sp_start_rep_agent pubs2
   go

6. Exit the isql session.

7. At the SAP Replication Server, create a database replication definition that also replicates the DDL:

   isql -Usa -P<password> -SPRS
create database replication definition <name>
with primary at <pds>.<pdb>
replicate DDL

where:
- <name> – is the unique identifier for this replication definition.
- <pds> – is the name of the primary SAP ASE data server.
- <pdb> – is the name of the primary database.

For example:

create database replication definition pubs2_repdef
with primary at sunak1502i.pubs2
replicate DDL
go

Database replication definition pubs2_repdef for sunak1502i.pubs2 is created.

8. Create a database subscription for the replicate database. This example creates a database subscription that uses no materialization method and will replicate the `truncate table` command:

create subscription <sub_name>
for database replication definition <name>
with primary at <pds.pdb>
with replicate at <rds.pdb>
without materialization
subscribe to truncate table

where:
- <sub_name> – is the unique identifier for this subscription.
- <name> – is the unique identifier for the replication definition.
- <pds> – is the name of the primary SAP ASE data server.
- <pdb> – is the name of the primary database.
- <rds> – is the name of the replicate SAP ASE data server.

For example:

create subscription pubs2_sub
for database replication definition pubs2_repdef
with primary at sunak1502i.pubs2
with replicate at sunak1505i.pubs2
without materialization
subscribe to truncate table
go

**Note**

Make sure the connection to the replicate database is available so that the subscription can be successfully created or dropped.

9. Check the subscription status at the primary and replicate data servers:

check subscription pubs2_sub
for database replication definition pubs2_repdef
with primary at sunak1502i.pubs2
with replicate at sunak1505i.pubs2
go
If status shows that the subscriptions are valid, the database is now ready for replication:

| Subscription pubs2_sub is VALID at the replicate. |
| Subscription pubs2_sub is VALID at the primary. |

If the status indicates errors, verify that the replicate connection is available, then drop the subscription using the `drop subscription` command. For example:

```sql
drop subscription pubs2_sub
for database replication definition pubs2_repdef
with primary at sunak1502i.pubs2
with replicate at sunak1505i.pubs2
without purge
go
```

Then you can fix the error and re-create the subscription.

### 5.1.3 Replicating DDL

Replicate data definition language (DDL) from the primary database to the replicate database.

**Procedure**

1. Log in to the primary database using a user ID that exists on both the primary and replicate data server and that has permission to create a table on both the primary and replicate databases.

   **Note**
   
   Do not use the maintenance user ID you used to set up the primary connection.

2. Create a new table:

   ```sql
   % isql -Usa -P<password> -Ssunak1502i
   use pubs2
   go
   create table t1 (a char(10), b integer, c text)
   go
   ```

3. Create unique indexes to ensure data integrity:

   ```sql
   create unique clustered index t1_idx1 on t1 (a,b)
   go
   ```

4. Log in to the replicate database:

   ```sql
   % isql -Usa -P<password> -Ssunak1505i
   use pubs2
   go
   ```

5. Verify that the table and index exist in the replicate database. If the table and index do not exist, perform the following:
Check the SAP Replication Server log file at `$SYBASE/REP-15_5/install/PRS.log` (`%SYBASE%\REP-15_5\install\PRS.log` in Windows), using a login that differs from the maintenance user who set up the primary connection. Correct the errors and restart the connection to the replicate database:

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

where:
- `<rds>` – is the name of the data server that hosts the replicate database.
- `<rdb>` – is the name of the replicate database.

(Optional) If you want SAP Replication Server to skip any current transactions when trying to resume connection to the replicate database, use:

```
resume connection to <rds>.<rdb>
skip transaction
GO
```

See `resume connection` in the Reference Manual for complete syntax and usage information.

If you see the following message, make sure the Replication Agent is configured to send warm standby transactions and that it has been stopped and restarted since the last time when the RepAgent configuration parameter was changed:

Message from server: Message: 2762, State 3, Severity 16 - The 'CREATE TABLE' command is not allowed within a multi-statement transaction in the 'pubs2' database.

6. Grant insert, update, and delete permission for the new table to the replicate database maintenance user at the replicate database:

```
grant all on t1 to pubs2_maint
GO
```

### 5.1.4 Replicating DML

Replicate data manipulation language (DML) from the primary database to the replicate database.

**Procedure**

1. Log in to the primary database using a user ID that has permission to insert, update, delete and truncate a table.

   **Note**
   
   Do not use the maintenance user ID you used to set up the primary connection.

2. In the primary database, insert a row to `t1`:

   ```
   insert into t1 values('a',1,'this is the first row')
   ```
3. Check whether the row exists in the replicate database:

```sql
select * from t1
```

If the row does not exist, check the SAP Replication Server log file at: `$SYBASE/REP-15_5/install/PRS.log` (or `$SYBASE\REP-15_5\install\PRS.log` in Windows). Correct the errors and restart the connection to the replicate database:

```sql
resume connection to <rds>.<rdb>
```

where:
- `<rds>` – is the name of the data server that hosts the replicate database.
- `<rdb>` – is the name of the replicate database.

(Optional) If you want SAP Replication Server to skip any current transaction when trying to resume connection to the replicate database, use:

```sql
resume connection to rds.rdb skip transaction
```

See `resume connection` in the Reference Manual for complete syntax and usage information.

4. Log in to the primary database and update the row:

```sql
update t1 set c = 'this is an update' where b = 1
```

5. Log in to the replicate database and verify that the row was updated:

```sql
select * from t1
```

6. Log in to the primary database and enter:

```sql
truncate table t1
```

7. Log in to the replicate database and enter:

```sql
select count (*) from t1
```

The number of rows at the replicate table, `t1`, should now be zero.
5.2 Replicating a Table

You can replicate specific tables in the primary database to the replicate database.

Prerequisites

Follow the instructions in Adding Databases to the Replication System [page 41] to add the primary database and the replicate database to the replication system.

Context

This example uses the publishers table in the pubs2 database to set up table replication from the sunak1502i SAP ASE server (the primary data server) to the sunak1505i SAP ASE server (the replicate data server). You can use another table in another database if you already set up database replication on pubs2 between the two servers in the example of Replicating a Database [page 40].

Procedure

1. To prepare the replicate tables, check replication system components using isql to log in to the servers identified for the primary and replicate sites.
2. Log in to the pubs2 database in the sunak1502i SAP ASE server, and verify that the publishers table exists:

   ```
   isql -Usa -P<password> -Ssunak1502i
   use pubs2
   go
   sp_help publishers
   go
   ```

3. Create a login name, pubs2_user, and grant the relevant permissions to it for creating the subscription in the sunak1502i SAP ASE server. This user must also exist in SAP Replication Server in the replication system.
   a. In sunak1502i, create the pubs2_user login name:

   ```
   use master
   go
   create login pubs2_user with password <password> default database pubs2
   go
   ```

   b. In sunak1502i, add the pubs2_user login name to the pubs2 database, and grant select permission to pubs2_user on the publishers table:

   ```
   use pubs2
   go
   ```
sp_adduser pubs2_user
go
grant select on publishers to pubs2_user
go

c. In SAP Replication Server, create the "pubs2_user" login name and grant primary subscribe and create object permissions to pubs2_user:

```sql
isql -Usa -P<password> -SPRS
create user pubs2_user
set password <password>
go
grant primary subscribe to pubs2_user
go
grant create object to pubs2_user
go
```

4. In SAP Replication Server, create the replication definition publishers_rep for the publishers table:

```sql
create replication definition publishers_rep
with primary at sunak1502i.pubs2
with all tables named 'publishers'
(pub_id char(4), pub_name varchar(40),
city varchar(20), state char(2))
primary key (pub_id)
searchable columns (pub_id, pub_name)
replicate minimal columns
go
```

5. In sunak1502i, use the sp_setreptable system procedure as the database owner or system administrator to mark the publishers primary table for replication:

```sql
sp_setreptable publishers, 'true'
go
```

6. In the sunak1505i replicate data server, log in to the pubs2 database, and verify that the publishers table exists:

```sql
isql -Usa -P<password> -Ssunak1505i
use pubs2
go
sp_help publishers
go
```

When you add the replicate pubs2 database using rs_init, the maintenance user is created and given replication_role. Make sure this user has replication_role and sa_role. Alternatively, you can alias the database owner to replicate truncate table.

In sunak1505i, verify that the maintenance user has select, insert, delete, and update permissions on the publishers table:

```sql
grant all on publishers to pubs2_maint
go
```

7. Log in to SAP Replication Server as pubs2_user, and create the subscription publishers_sub for the replication definition publishers_rep:

```sql
isql -Upubs2_user -P<password> -SPRS
create subscription publishers_sub
for publishers_rep
with replicate at sunak1505i.pubs2
```
subscribe to truncate table

This subscription uses the default atomic materialization. The where clause is not included, so all rows are replicated. Execution of the truncate table command is reproduced at the destination database.

8. While still logged into SAP Replication Server, use the check subscription command to monitor the status of the subscription materialization:

```
check subscription publishers_sub
for publishers_rep
with replicate at sunak1505i.pubs2
```

9. To make sure that replication is occurring as expected, verify that a row you insert is copied to the replicate table.
   a. In sunak1502i, insert a row into the publishers table:
      ```
isql -Usa -P<password> -Ssunak1502i
use pubs2
insert publishers
values ('9950', 'Who Donut', 'Butler', 'CA')
go
```
   b. In sunak1505i, verify that the row you inserted was replicated into the replicate copy of the publishers table:
      ```
isql -Usa -P<password> -Ssunak1505i
use pubs2
select * from publishers
```

**Results**

You have set up the replication on the publishers table successfully. You can repeat the process to set up replication on other tables if needed.
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