SAP®

SAP jConnect™ for JDBC 16.0

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SAP jConnect Components

SAP® jConnect™ for JDBC (SAP jConnect) components are SAP and non-SAP supported.

SAP jConnect includes:

- JDBC driver – implements the JDBC standard to provide optimal connectivity to the complete family of SDK for SAP® ASE products, allowing access to over 25 enterprise and legacy systems, including SAP® Adaptive Server® Enterprise (SAP® ASE), SAP® SQL Anywhere®, SAP® IQ, SAP® Replication Server®, and SAP® DirectConnect™.
- Ribo – allows database developers to capture and view communication between SAP jConnect and a database. Ribo can also decode Tabular Data Stream™ (TDS) messages, which SAP ASE database use to communicate with client applications, helping developers to diagnose problems.

System Requirements for SAP jConnect

Minimum system requirements for installing SAP jConnect for JDBC.

Item	Requirements
Hardware and operating system	Any version of these platforms that support Java 6: • Apple Mac OS X Intel • HP-UX Itanium 32-bit or 64-bit • HP-UX PA-RISC 32-bit or 64-bit • IBM AIX POWER 32-bit or 64-bit • Linux x86 32-bit or x86-64 64-bit • Linux POWER 32-bit or 64-bit • Solaris x86-64 32-bit or 64-bit • Solaris SPARC 32-bit or 64-bit • Microsoft Windows x86 32-bit or x86-64 64-bit For the most current list of supported operating systems, see the SAP platform certifications page at *http://certification.sybase.com/ucr/search.do*
Memory	16MB
Disk space	Approximately 12MB for the default options. Space requirement by component: • JDBC driver – 9MB • Ribo – 3MB **Note:** Ribo is dependent on the JDBC driver; when you install Ribo, the JDBC driver is also installed.

Item	Requirements
Java Developer's Kit (JDK) or Java Runtime Environment (JRE)	JDK 6 or later, or JRE 6 or later.
Other SAP products (optional)	SAP IQ, SAP® OmniConnect™, and SAP DirectConnect.
Web server (optional)	For SAP jConnect's TDS-tunnelling servlet, any Web server that supports the HTTPS protocol and javax.servlet interfaces.

Download and Install SAP jConnect

Downloading and installation instructions for SAP jConnect for JDBC version 16.0.

The instructions for installing SAP jConnect on Microsoft Windows and UNIX platforms. These instructions apply only to the standalone SAP jConnect product.

Note: For installing SAP jConnect included with SAP Adaptive Server, Software Developer's Kit, or other SAP products, use the *Installation Guide* for that product.

Downloading SAP jConnect

SAP jConnect is available on the Sybase Software Download Web site or from a CD.

If you cannot download SAP jConnect from the Sybase Web site, contact SAP Technical Support to request for a CD.

1. Log in to the Sybase Software Download Web site at *http://downloads.sybase.com*. The product list page appears.
2. Select SAP jConnect for JDBC. The latest versions of SAP jConnect for JDBC appears.
3. Select the SAP jConnect for JDBC software that you need.
4. Read the End User License Agreement. Select **I Agree**.
5. Read the Export Control Restrictions. Select **I Agree**.
6. Click **Continue**.

   The product download page lists the software package and the EBF- related documentation for SAP jConnect.
7. Download and uncompress the SAP jConnect software package.

Note: The software package contains SAP jConnect installers for both Microsoft Windows and UNIX, as well as the EBF-related documentation.

Mounting CD

Instructions to mount SAP jConnect CD for various operating systems.

Note: The location of the mount command is server-specific and may differ from the instructions shown here. If you cannot mount the CD drive using the path shown, check your operating system documentation or contact your system administrator.

1. Insert the SAP jConnect installation media in the appropriate drive.

2. Start the installer

- For HP HP-UX – Log out, log in as "root", mount the CD and enter:
  ```
  mount -F cdfs -o ro,rr /device_name /cdrom
  ```

  Then, log out and log in again as "sybase".

- For IBM AIX – Log in as "sybase," mount the CD and enter:
  ```
  /usr/sbin/mount -v cdrfs -r device_name /cdrom
  ```

  where *device_name* is the CD drive device name, and `/cdrom` is the name of the directory where the CD is to be mounted.

- For Solaris – The operating system automatically mounts the CD. Log in as "sybase". If you receive CD-reading errors, check your operating system kernel to make sure the ISO 9660 option is turned on. On Solaris, the CD drive device name is */cdrom/cdromx*, where x is the number of the CD device.

- For Linux – The operating system automatically mounts the CD.

Installation Modes

Determine the installation mode to use.

Note: SAP recommends that you use the GUI mode for installing SAP jConnect.

You can install SAP jConnect using:

- Graphical user interface (GUI) mode– installs the components using the SAP jConnect installer interface.
- Console mode – installs components in a command line environment.

If you encounter the following JVM error, download and install JDK 6 or JRE 6:

```
./setup.bin
Preparing to install...
Extracting the installation resources from the installer archive...
Configuring the installer for this system's environment...
No Java virtual machine could be found from your PATH environment
variable. You
must install a VM prior to running this program.
```

Note: Install JDK if you plan to develop programs that use SAP jConnect.

Installing SAP jConnect in GUI Mode

Instructions to install for SAP jConnect in GUI Mode.

Note: The setup program is located in the `Disk1/InstData` directory on the SAP jConnect CD. Change to this location or add the directory to the installation command.

Prerequisite

For Microsoft Windows, ensure that your login ID has administrative privileges. For UNIX, ensure that your login ID has write-access to the install directory.

1. Start the installer.

   • For Microsoft Windows: If you are installing from the CD, the installer should start automatically. If it does not, or if you are installing from a downloaded file, select **Start > Run**, and enter:

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

   where `setup.exe` is the executable file that installs SAP jConnect, and `x:\path\` is the path to `setup.exe`.

   • For IBM AIX, Linux, and Solaris:

   ```
   cd /cdrom/cdromn/pathname
   ./setup.bin
   ```

   • For HP HP-UX:

   ```
   cd /cdrom/pathname
   ./setup.bin
   ```

   where `cdrom/cdromn` is the directory (mount-point) you specified when mounting the CD drive. For example, on Solaris the mount-point can be `cdrom/cdrom0` and `setup.bin` is the executable file that installs jConnect.

   If JDK_or_JRE_installation_directory/bin is not defined in the *PATH* environment variable, call setup.exe (Microsoft Windows) or setup.bin (UNIX platforms) using the LAX_VM java_binary_path argument. For example:

   • UNIX platforms:

   ```
   ./setup.bin LAX_VM /work/jre6/bin/java
   ```

   • Microsoft Windows:

   ```
   .\setup.exe LAX_VM "C:\Program Files\Java\jre1.6.0_06\bin
   \java.exe"
   ```

2. Read the introduction. Click **Next**.
3. Read the License Agreement. Click **Next**.
4. Choose the installation directory.

Decision	Action
To accept the default directory	Click **Next**.
To specify a different directory	Click **Choose**.
Type the directory path in the input field	Click **Next**.

One of these occurs:

   • If the installation directory does not exist, the installer prompts:

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

Click **Yes**.

- If the installation directory contains SDK for SAP ASE products, the installer prompts:

```
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 installed with jConnect, the installer overwrites the common files.

5. Choose the installation type:

- Typical (default)– installs the JDBC Driver and Ribo components. The components to be installed and the total disk space required appear before the installation executes. These components are described in *jConnect Components*.

- Custom – allows you to select the SAP jConnect components to install. When you select Custom, the next window displayed is the Choose **Install Set** window, which allows you to select the components you want to install.

Note: Some components are automatically installed if they are required to run other selected components.

After you have selected the installation type, click **Next**.

The Pre-Installation Summary window displays the product features or components to be installed and the total disk space required for all the selected features.

6. Review the information in the Pre-Installation Summary window. Click **Install**.The installation program unloads all the components from the CD and displays a progress indicator.

7. Quit the installer. In the Install Complete window, click **Done**.

Installing SAP jConnect in Console Mode

Run the installer in console mode.

The setup program is located in the `Disk1/InstData` directory on the SAP jConnect CD. Change to this location or add the directory to the installation command.

At the command line, enter:

- For Microsoft Windows
```
.\setupConsole.exe -i console
```
- For UNIX platforms
```
./setup.bin -i console
```

See *Installing in GUI Mode* for the flow. The flow of the installation is identical to GUI installation, except that the display is written to a terminal window and responses are entered using the keyboard. Follow the remaining prompts to install the product.

See also

*   *Installing SAP jConnect in GUI Mode* on page 4

Postinstallation Task for SAP jConnect

Postinstallation tasks to test your installation, configure SAP jConnect, and install stored procedures.

Setting JDBC_HOME

JDBC_HOME represents the directory in which you install SAP jConnect.

To set JDBC _HOME for different platforms:

- For Microsoft Windows – if your installation directory is `C:\Sybase`, set JDBC_HOME to `C:\Sybase\jConnect-16_0`.
- For UNIX platforms – if your installation directory is `/opt/sybase`, set JDBC_HOME to `/opt/sybase/jConnect-16_0`.

Setting CLASSPATH Variable

The CLASSPATH environment variable specifies the location of the SAP jConnect runtime classes and the jar files for Java 6 or later

Set the CLASSPATH depending on the versions of JDK and SAP jConnect you are using.

To use SAP jConnect 16.0 with Java 6 or later:

Add these to CLASSPATH

- Microsoft Windows – `%JDBC_HOME%\classes\jconn4.jar`
- UNIX platforms – `$JDBC_HOME/classes/jconn4.jar`

To run the samples or TDS-Tunnelling Servlet

Add these to CLASSPATH:

- Microsoft Windows–`%JDBC_HOME%\classes\jconn4.jar;%JDBC_HOME%\classes`
- UNIX platforms – `$JDBC_HOME/classes/jconn4.jar:$JDBC_HOME/classes`

> **Note:** SAP recommends that you run Java 6 or later with SAP jConnect 16.0. In addition, CLASSPATH should include the location of any application classes you have defined.

Firefox CLASSPATH Restriction

Some restrictions may apply to the way you set CLASSPATH if you use Firefox.

The Java Virtual Machine (JVM) security manager does not allow a version of SAP jConnect installed in your local file system to create a connection to a server, even if the server is your local system. This can create a problem if you use Firefox to run an applet that uses SAP jConnect.

When Firefox loads SAP jConnect to connect to a server, it looks at CLASSPATH to find the SAP jConnect classes. If it finds a path that points to your local SAP jConnect installation, it loads SAP jConnect directly from the local file system rather than from the server and tries to create a connection. This generates a security error and the connection fails.

Do not include the local SAP jConnect directory in CLASSPATH if you are using Firefox to run SAP jConnect applets.

Install Stored Procedures

SAP jConnect to function properly, you must install stored procedures and tables on the SAP Adaptive Server or SAP SQL Anywhere database to which your application is connecting.

SAP jConnect provides these scripts to install the required stored procedures and tables:

- sql_server.sql – installs stored procedures on SAP Adaptive Server earlier than version 12.0.
- sql_server12.sql – installs stored procedures on SAP Adaptive Server 12.0.x.
- sql_server12.5.sql – installs stored procedures on SAP Adaptive Server 12.5.x.
- sql_server15.0.sql – installs stored procedures on SAP Adaptive Server 15.0.x through 15.5.x.
- sql_server15.7.sql – installs stored procedures on SAP Adaptive Server 15.7 or 15.7 ESD #1.
- sql_server15.7.0.2.sql – installs stored procedures on SAP Adaptive Server 15.7 ESD #2 or later.
- sql_server16.0.sql – installs stored procedures on SAP Adaptive Server 16.0.
- sql_asa.sql – installs stored procedures on SAP SQL Anywhere 9.x.
- sql_asa10.sql – installs stored procedures on SAP SQL Anywhere 10.x.
- sql_asa11.sql – installs stored procedures on SAP SQL Anywhere 11.x.
- sql_asa12.sql – installs stored procedures on SAP SQL Anywhere 12.x.
- sql_asa16.sql – installs stored procedures on the SAP SQL Anywhere database version 16.x.

Running Stored Procedure Installation Scripts

1. Verify that your JAVA_HOME, JDBC_HOME, and CLASSPATH environment variables are set.
2. Use the `IsqlApp` sample application.

Installing Stored Procedures on SAP Adaptive Server Database

Go to the (Windows) `%JDBC_HOME%\classes` (UNIX) `$JDBC_HOME/classes` directory from the prompt window and enter:

- For SAP Adaptive Server Enterprise version 16.x:

  (Windows) `java IsqlApp -U sa -P password -S jdbc:sybase: Tds: [hostname]:[port] -I %JDBC_HOME%\sp\sql_server16.0.sql -c go`

  (UNIX) `java IsqlApp -U sa -P password -S jdbc:sybase: Tds: [hostname]:[port] -I $JDBC_HOME/sp/sql_server16.0.sql -c go`

Note: The sql script to be used is dependent on the SAP ASE version. See *Install Stored Procedures* for a list of scripts available.

Installing Stored Procedures on a SAP SQL Anywhere Database

- For Microsoft Windows – Go to `%JDBC_HOME%\classes` directory and enter:

```
java IsqlApp -U dba -P password -S jdbc:sybase:Tds:[hostname]:
[port]
-I %JDBC_HOME%\sp\sql_asa.sql -c go
```

- For UNIX platforms – Go to `$JDBC_HOME/classes` directory and enter:

```
java IsqlApp -U dba -P password -S jdbc:sybase:Tds:[hostname]:
[port]
-I $JDBC_HOME/sp/sql_asa.sql -c go
```

See also
- *Running Stored Procedure Installation Scripts* on page 11

Running Stored Procedure Installation Scripts

Run stored procedure installation scripts.

1. Verify that your JAVA_HOME, JDBC_HOME, and CLASSPATH environment variables are set.
2. Use the `IsqlApp` sample application. See *Installing Stored Procedures on an Adaptive Server database*.

See also
- *Install Stored Procedures* on page 10

Review Installation Contents for SAP jConnect

Contents listed after completing the SAP jConnect installation.

Packages

For SAP jConnect version 16.0, the following packages are found inside the `jconn4.jar` file of the release build, and the `jconn4d.jar` file of the debug build:

```
com.sybase.jdbc4.jdbc
com.sybase.jdbc4.tds
com.sybase.jdbc4.timedio
com.sybase.jdbc4.charset
com.sybase.jdbcx
```

The SAP jConnect driver, `com.sybase.jdbc4.jdbc.SybDriver`, is located in the `com.sybase.jdbc4.jdbc` package.

Directories and Files

These directories are created in `$SYBASE` (UNIX platforms) or `%SYBASE%` (Microsoft Windows) when you install SAP jConnect:

- `jConnect-16_0` – contains JDBC driver directories and files.
- `jutils-3_0\ribo` – contains Ribo directories and files.

Table 1. Directories and Files in the jConnect-16_0 Directory

Name	Type	Description
classes	Subdirectory	Contains these SAP jConnect 16.0 components: • `jconn4.jar` file that contains SAP jConnect 16.0 classes • `sample2` subdirectory with SAP jConnect 16.0 class files for sample applets and applications • `gateway2` subdirectory for compiled TDS-tunnelling servlet
devclasses	Subdirectory	Contains the `jconn4d.jar` file that contains the same SAP jConnect 16.0 components as `jconn4.jar`, but debug mode is turned on.
docs	Subdirectory	Contains the en subdirectory, which contains the English javadoc documentation.
gateway2	Subdirectory	Contains source code for the TDS-tunnelling servlet.
sample2	Subdirectory	Contains source code for sample Java applications.
sp	Subdirectory	Contains isql scripts that install stored procedures for function escapes and DatabaseMetaData methods on a database server. See *Installing Stored Procedures* for a list of scripts available.

Name	Type	Description
tools	Subdirectory	Contains a perl script (decode-tli) that UNIX or Microsoft Windows users can apply to parse an interfaces (UNIX platforms) or sql.ini (Microsoft Windows) file into a readable format.
index.html	HTML file	Contains links to SAP jConnect documentation and SAP jConnect samples.
netimpct.gif	Graphic file	Contains a SAP jConnect graphic.
version.txt	Text file	Contains the SAP jConnect version string.

Table 2. Directories and Files in jutils-3_0\ribo Directory

Name	Type	Description
doc	Subdirectory	Contains the *Ribo Users Guide*.
Ribo	Shell script	An executable file that starts the Ribo application.
Ribo.bat	MS-DOS batch file	A Microsoft Windows batch file that starts the Ribo application.
ribo.jar	JAR file	Contains the Java classes that implement Ribo.

JDBC Samples and Specifications
You can find JDBC samples and specifications in the *SAP jConnect for JDBC Programmers Reference*.

See also
• *Running Stored Procedure Installation Scripts* on page 11

Testing SAP jConnect Installation

After SAP jConnect is installed, run the Version program to test the SAP jConnect installation.

Note: The Version program connects to a demonstration database that SAP has made available on the Internet. You must have Internet access to run the Version program successfully, or explicitly run it with [-U username] [-P password] [-S servername] commands to point it to your database.

1. From the DOS or UNIX prompt, change to JDBC_HOME.
2. Verify that CLASSPATH is set for running the sample programs and enter `java sample2.SybSample Version`

   A SybSample window appears. At the top of the window, the Running Sybase Sample text box displays the source code for Version as the program runs. The middle text box (Sample Output) should display version information. `Using JDBC driver version 16.0 jConnect (TM) for JDBC(TM)/16.0...`

3. The output can be one of these:
   - If the previous message appears in the Sample Output text box, you have successfully installed SAP jConnect.
   - If you get the previous message but the source code for Version does not appear in the Running Sample text box, and the Status text box at the bottom of the window shows the following message, it means that you have successfully installed SAP jConnect but probably did not enter the command to run the Version program from the `sample2` directory under JDBC_HOME:

     `java.io.FileNotFoundException: Version.java`
   - If the SybSample window does not appear and you get the error message, check CLASSPATH to verify that it is set correctly:

     `Can't find class sample2.SybSample`
   - If the SybSample window does not come up, and you get one of the error messages, make sure that your path includes the bin subdirectory of your JDK home directory:

     ```
     "Name specified is not recognized as an internal
     or external command"
     "Bad command or file name"
     ```
4. Click **Close** to exit the SybSample window, when you have verified that your installation is successful.

Verifying SAP jConnect Version

Instructions to verify the installed SAP jConnect version.
Go to the %JDBC_HOME%\classes (Microsoft Windows) or $JDBC_HOME/classes (UNIX platforms) directory and enter: `java -jar jconn4.jar` This command prints a version

string like the:`jConnect (TM) for JDBC(TM)/16.0 GA (Build 27008)/P/`
`EBF22326/JDK 1.6.0/jdbcmain/OPT/Sun Jan 12 09:41:12 PST 2014`

The version string has important information about SAP jConnect:

- 16.0 is the version number.
- GA - indicates a GA release, this portion of the version strings will have SP, PL and N-OFF information for any release.
- Build 27008 indicates the build version of SAP jConnect. This number increases as subsequent ESDs are released.
- EBF number is an unique number identifying a particular release.
- OPT indicates that the build is an optimized build. DEBUG indicates that the build is a debug build.

SAP recommends that you check the Sybase download Web site periodically for updated versions of SAP jConnect and download the latest version.

Upgrade SAP jConnect

Review the upgrade instructions for SAP jConnect.

See the *SAP jConnect for JDBC Programmers Reference*.

Uninstall SAP jConnect

Uninstall the products and components in SAP jConnect.

Before uninstalling, consider:

- The SAP jConnect installer includes an uninstall feature that removes the components you have installed.
- If two or more products install shared components in the same directory, the uninstaller does not remove the shared component until all the products are uninstalled.

Note: Do not uninstall SAP jConnect from a directory that contains other products that have been installed using an installation program other than the SAP jConnect installer. By doing so, you may remove the components shared by products and affect their operation.

- The uninstall feature removes only those files that were loaded from the installer. Some files, such as log and configuration files, are left intact for administrative purposes. If all products are uninstalled from the directory and you do not need the remaining configuration files, you can manually delete the directory.

Uninstalling in GUI Mode

Instruction to uninstall SAP jConnect in GUI mode.

Before uninstalling, shut down all processes and applications that use the software or components that are going to be uninstalled.

Note: Use the uninstall script with caution. Running it deletes the jConnect-16_0 folder.

1. Start the uninstall script.

    - For Microsoft Windows enter:
      ```
      %SYBASE%\sybuninstall\comp\jConnect-16_0\uninstall.exe
      ```
    - For UNIX platforms enter:
      ```
      $SYBASE/sybuninstall/comp/jConnect-16_0/uninstall
      ```

2. Read the introduction. Click **Next**.
3. Choose the **Uninstallation type**.

    - Complete Uninstall – completely removes all components of jConnect. The files and folders created after the installation are not affected.
    - Uninstall Specific Features – allows you to uninstall specific components of SAP jConnect. If you select this option, the Choose Product Features window appears and you can select the components to uninstall.

4. Click **Next** to uninstall SAP jConnect.

> **Warning!** When you click **Next** and there are no SAP jConnect-dependent products installed, the uninstall program proceeds to uninstall SAP jConnect. You will not be able to cancel the operation.

One of these occurs:

- If there are products that are dependent on SAP jConnect, the installer prompts:
  ```
  SAP recommends that you cancel uninstalling jConnect.
  Otherwise, the jConnect-dependent products will not function.
  ```
- If there are no SAP jConnect-dependent products installed, the uninstall script removes the SAP jConnect components and displays a progress indicator.

5. Click **Done** to quit the uninstall program.

Uninstalling in Console Mode

Uninstall SAP jConnect in console mode.

1. Go to `%SYBASE%` (Microsoft Windows) or `$SYBASE` (UNIX platforms) directory.

2. At the command prompt enter:

- For Microsoft Windows – `%SYBASE%\sybuninstall\comp` `\jConnect-16_0\uninstall.exe -i console`
- For UNIX – `$SYBASE/sybuninstall/comp/jConnect-16_0/` `uninstall -i console`

The uninstall program starts.

See *Uninstalling in GUI Mode* . The flow of the uninstall program is identical to GUI uninstall, except that the display is written to a terminal window and responses are entered using the keyboard. Follow the remaining prompts to uninstall the product.