



**Installation and Configuration Guide**

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# **SAP Sybase IQ 16.0 SP2**

Linux

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# Preparing for Installation

Read this section before you install SAP® Sybase® IQ.

## About SAP Sybase IQ

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SAP® Sybase® IQ is a high-performance decision-support server designed specifically for mission-critical business intelligence, analytics, and data warehousing. Component Integration Services within SAP Sybase IQ provide direct access to relational and non-relational databases on mainframe, UNIX, or Windows servers.

## Supported Server Platforms

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SAP Sybase IQ is compatible with these platforms and operating systems.

- Red Hat Enterprise Linux 6.2 (and later) Linux on POWER; 64-bit
- Red Hat Enterprise Linux 6.2 (and later) x86-64, Advanced Server and Workstation Editions
- Red Hat Enterprise Linux 5.5 (and later) Linux on POWER; 64-bit
- Red Hat Enterprise Linux 5.5 (and later) x86-64, Advanced Server and Workstation Editions
- SuSE Linux Enterprise Server SLES 11/Linux on POWER – minimum patch level SP1
- SuSE Linux Enterprise Server SLES 11/X86\_64 64-bit – minimum patch level SP1

## Supported Client Platforms

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SAP Sybase IQ includes a network client for all supported server platforms.

- Red Hat Enterprise Linux 6.2 (and later) x86, Advanced Server and Workstation Editions
- Red Hat Enterprise Linux 5.5 (and later) x86, Advanced Server and Workstation Editions – minimum patch level Update-2
- SuSE Linux Enterprise Server (SLES) 11.0 – minimum patch level SP1

All SAP Sybase IQ UNIX and Linux installations include ODBC drivers needed for the client and Interactive SQL. SAP Sybase IQ Network Client for Windows includes 32-bit ODBC Windows drivers, which allow you to connect to SAP Sybase IQ from third-party 64-bit Windows applications, and 64-bit Windows applications written in C++. Platform support for the Windows network client includes Windows 2008 R2 SP1 and Windows 7 SP1.

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**Note:** SAP Sybase IQ network client does not run on IBM Linux on POWER.

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### **Licensing Requirements**

All product editions except the Evaluation Edition require a license. Optional features are sold and licensed separately.

Whether you install a licensed or evaluation edition, you have 30-day access to all features and options. To use an option beyond the 30-day evaluation period, you must purchase and install an appropriate SAP Sybase Software Asset Management (SySAM) license.

The e-mail message or Web key you receive when you purchase an SAP Sybase product provides specific product and licensing information. Before installing and configuring any product edition, know which features you are licensed to use.

### **Installation Media**

SAP Sybase IQ installation media includes software for server and client installations.

**Table 1. SAP Sybase IQ Installation Media.**

Media	Description
SAP Sybase IQ Server Suite	Installs server components and other support tools.
SAP Sybase IQ Client Suite	Installs the components required for client connections to a SAP Sybase IQ server.

### **Planning Your Installation**

The installation process depends on whether you are installing for the first time, upgrading from a previous version, or migrating your databases to a new hardware platform.

**Note:** SAP Control Center is a Web-based tool for managing and monitoring SAP Sybase servers, including single-node and multiplex servers. If you plan to use SCC to manage your servers, see the *Sybase Control Center Installation Guide* before you install.

### **Installing For the First Time**

Follow these steps to install SAP Sybase IQ for the first time.

- Read the release bulletin for the latest information. See the special installation instructions section for any installation instructions not included in this document.
- Complete all pre-installation tasks. Apply any required operating system patches, check to see that there is sufficient disk space and memory, and update any necessary configuration changes.



- Determine the license model you want to use. SySAM supports served and unserved license models. See the *Sybase Software Asset Management (SySAM) 2 Users Guide* to determine which model is best suited for your environment.
- Use the product and licensing information you received from SAP Sybase to log in to the SAP Sybase Product Download Center at: <https://sybase.subscribenet.com> or SAP Service Marketplace at <http://service.sap.com/licensekeys> and generate a license key for your software.
- Install SAP Sybase IQ server components, activate your license, then start and test your server.
- Install and configure SAP Sybase IQ client components.

### **Upgrading From an Earlier Version**

Follow these general guidelines when you install a new version of SAP Sybase IQ.

- Choose an appropriate installation directory. You cannot install SAP Sybase IQ in the same parent directory as an earlier version. Uninstall the version currently installed on your system, or install in a different parent directory.
- Upgrade your client tools. Although you can use the current version of the client tools to connect to an earlier server version, some options, tools, and objects may not be available.

#### *Additional Information*

*Migration > Database Upgrades*

### **Changing Hardware Platforms**

Although SAP Sybase IQ Server Suite is no longer available for 32-bit platforms, you can move a 32-bit database to a 64-bit platform, and move a database from one platform to another.

#### *Additional Information*

- *Migration > Hardware Changes > Moving 32-Bit Databases to 64-bit Platforms*
- *Migration > Hardware Changes > Converting to a new hardware platform*

### **Planning for Distributed Query Processing or High Availability**

Distributed query processing can benefit from an optional high-speed interconnect. Use scalable interconnect technology to connect multiplex nodes.

For best performance, use:

- A high-speed network interconnect providing a local network that connects all multiplex nodes. Use an interconnect bandwidth of 1Gb or higher or the highest bandwidth, lowest latency interconnect available.
- Two physically separate network interfaces for each multiplex node:
  - A public network for multiplex interconnection traffic and client traffic.

## Preparing for Installation

- A private network for multiplex interconnect traffic only, excluding external client traffic. Currently, multiplex interconnects support only the TCP/IP standard. These two networks improve security, fault-tolerance, and performance.
- A switch that enables high-speed communication between nodes.
- Network cards that reside on different fabrics so that the multiplex survives network failure. Separate the public and private networks physically.
- Private interconnect fabrics that contain only links to machines participating in the multiplex. Private interconnect for all multiplex nodes should connect to the same switch, which connects to no other public switches or routers.
- Redundant network interface cards added to private or public networks if desired. The private and public connection information allows for multiple IP addresses on each.

## Preinstallation Tasks

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Perform the following tasks before you install SAP Sybase IQ.

### Check for Operating System Patches

Check with your vendor and apply the latest operating system patches. Do not use a patch that is earlier than the version suggested for your operating system.

### Install 32-bit Compatibility Libraries

Red Hat Enterprise Linux 6 requires 32-bit compatibility libraries to support Java-based applications.

These libraries are required to install SAP Sybase IQ on Red Hat Enterprise Linux 6:

- `libXext-devel.i686`
- `libXtst-devel.i686`

If you start the installer in GUI mode without installing these libraries, the installer generates an exception and fails.

### Increase the Swap Space

The recommended minimum swap space is at least 1GB. Certain operations may cause the memory usage to grow dynamically. Changing the way SAP Sybase IQ uses buffers can dramatically change the way it uses memory.

Depending on the load, swap requirements may exceed space allotted. Insufficient swap space may result in the system supporting fewer users, and large processes that cannot acquire sufficient swap space may be prematurely killed by the operating system.

See your operating system documentation for information about extending swap space.

## License Server Requirements

SAP Sybase IQ requires SySAM license server version v11.6.1 or later, which is distributed on the SAP Sybase IQ Server Suite installation media. Using an older SySAM server can cause the server to become unresponsive. Install the license server before you install SAP Sybase IQ.

To check the version of your current SySAM license server, open a console or command prompt, change to \$SYBASE/SYSAM-2\_0/bin, and enter:

```
./lmutil lmver lmgrd
```

If you currently use a license server to host SySAM licenses for other Sybase products:

- Uninstall your current license server
- Install the license server distributed on the SAP Sybase IQ Server Suite DVD
- Rehost your licenses

Rehost your SySAM licenses after you install the new license server.

### Additional Information

*Sybase Software Asset Management (SySAM) 2 Users Guide*

## Resolve Potential Name Conflicts

Red Hat Linux includes a unixodbc package that can cause name conflicts with components provided with SAP Sybase IQ. To avoid name conflicts, rename the files.

Rename this...	To...
/usr/lib/isql	/usr/lib/isql.org
/usr/lib/libodbc.so	/usr/lib/libodbc.orig.so
/usr/lib/libodbc.so.1	/usr/lib/libodbc.orig.so.1

## Set the Kernel Parameters

Set the number of available semaphore identifiers to at least 4096.

To display the current values of the semaphore kernel parameters, use:

```
cat /proc/sys/kernel/sem
```

```
250 32000 32 4096
```

The four values displayed are:

## Preparing for Installation

- SEMMSL – maximum number of semaphores per set.
- SEMMNS – maximum number of semaphores system-wide.
- SEMOPM – maximum number of operations allowed for one semop call.
- SEMMNI – maximum number of semaphore identifiers (sets).

To adjust these values, and save them for future server restarts, edit the `/etc/sysctl.conf` file. For example, to increase the maximum number of semaphore identifiers to 4096, add the following line:

```
kernel.sem = 250 32000 32 4096
```

Make sure you leave one space before and after equals sign.

To make a change that lasts only until the next restart, use:

```
echo 250 32000 32 4096 > /proc/sys/kernel/sem
```

## Install the Required Package Groups

Linux x86-64 requires 32-bit libraries to run some client applications.

Before you install SAP Sybase IQ on Linux x64-86, you must also install:

- **libncurses.so.5** – To find the ncurses version on your installation, type **rpm -q ncurses** at a shell prompt.
- **compat-libstdc++-296** – To find the compatibility version on your installation, type **rpm -q -a | grep compat** at a shell prompt.

## Verify Network Functionality

Make sure your network devices can communicate before you install SAP Sybase IQ.

SAP Sybase IQ uses networking software whenever the client and server components are installed on different systems. Use the **ping** command to and from another computer to verify that the server where you plan to install SAP Sybase IQ can use TCP/IP to communicate with other devices on your network.

## Windows Installer Requires Microsoft Visual C++ 2005 SP1 Redistributable Package

Launching the installer may return the following exception: Windows error 14001 occurred while loading the Java VM.

If you get this error, install the Microsoft Visual C++ 2005 Service Pack 1 Redistributable Package MFC Security Update before launching the installer again. This service pack is included as part of the installation package.

1. Open Windows Explorer.
2. Navigate to `\archives\ms-redist-2005` on the installable image.
3. Do this:

- On 32-bit machines, run `vcredist_x86.exe`
- On 64-bit machines, run `vcredist_x86.exe` and `vcredist_x64.exe`

Microsoft Visual C++ 2005 Service Pack 1 Redistributable Package MFC Security Update is also available as a free download from the Microsoft Download Center at: <http://www.microsoft.com/en-us/download/details.aspx?id=26347>.



# Licensing Your Software

When you purchase a SAP Sybase product, you receive an e-mail message or a Web key that tells you how to generate SAP Sybase IQ license keys on the Web. The e-mail message or Web key also provides specific product and licensing information. Use this information when you generate your licenses.

## Available Licenses

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Available licenses are determined by the product edition and options you purchase.

### Enterprise Edition (EE)

SAP Sybase IQ Enterprise Edition requires a CPU license and supports several licensing options.

**Table 2. Enterprise Edition.**

Order-able License	Actual License	Required	Optional	Description
CPU	IQ_CORE	•		Restricts the number of cores (not CPUs) that a server can use
LOMO	IQ_LOB		•	Allows you to create and use CLOB or LOB columns. The number of LOB licenses must match number of cores.  IQ_LOB license is included for customers who purchase an IQ_UDA license. An IQ_LOB license is also available as a separate purchase option.

Order-able License	Actual License	Required	Optional	Description
VLDB MO	IQ_VLDBMGMT		•	<p>Allows you to create multiple tablespaces and additional dbspaces beyond the defaults:</p> <ul style="list-style-type: none"> <li>You are allowed one IQ_SYSTEM_TEMP dbspace, one IQ_SYSTEM_MAIN dbspace, one IQ_SHARED_TEMP, and one additional user defined main store dbspace.</li> <li>Additional dbspaces require the IQ_VLDBMGMT license, which restricts the ability to create table partitions. An IQ_VLDBMGMT is required whenever an SAP Sybase IQ server creates or starts with two or more IQ user dbspaces.</li> </ul> <p>Each VLDB license allows for 1 TB of storage. You will need to purchase one license for each additional TB of storage in the main store.</p>
ASO	IQ_SECURITY		•	<p>Allows you to use column encryption, ECC Kerberos and FIPS. The number of ASO licenses must match cores.</p>
MPXO	IQ_MPX NODE		•	<p>Allows you to start secondary multiplex nodes (readers/writers). The number of nodes must always be less than cores, as each multiplex server must have at least one core.</p>
IDBA-PSO	IQ_UDF		•	<p>Allows you to define and run high-performance scalar and aggregate user-defined functions.</p> <p>This license is only available with approved third-party libraries.</p>
	IQ_IDA		•	<p>Allows you to build, deploy and run your own C/C++ V4 User-Defined Functions (UDF).</p> <p>The IQ_IDA license will function as both the InDatabase Analytics Option and Partner Solutions license.</p>
UDA	IQ_UDA		•	<p>Allows you to use the IQ Text Search functionality, which lets SAP Sybase IQ search unstructured and semi-structured data. An IQ_UDA also includes an IQ_LOB license. This license applies to <b>TEXT</b> indexes.</p>



## **Small Business Edition (SE)**

SAP Sybase IQ Small Business Edition requires a CPU license.

**Table 3. Small Business Edition.**

Orderable License	Actual License	Re-quired	Optional	Description
CPU	IQ_CORE	•		Licenses the number of sockets (not CPUs) which an IQ server can use.

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### **Note:**

- Server checks out licenses equal to the number of sockets. One license allows one socket, and you can have up to four licenses. The total number of cores should never exceed 4 (MAXCP).
  - Total concurrent IP connections  $\leq 25$  (MC).
  - Total main store  $\leq 250\text{GB}$  (MS).
- 

## **Evaluation Edition**

The Evaluation Edition does not require a license. The Evaluation Edition is an unlicensed server, which provides full access to all features and options available in the Enterprise Edition. To run an unlicensed database beyond a 30-day evaluation period, however, you must purchase and install an appropriate license.

## **Express Edition**

Unlike the Evaluation Edition, the Express Edition does not expire, but does place some limits on the way you deploy your server.

Available at no cost, the SAP Sybase IQ Express Edition supports all options and features available in the Evaluation Edition. The Express Edition includes a new IQ\_XE SySAM license, which is installed as part of the Express Edition server package.

Unlike the Evaluation Edition, which limits server access to a 30-day appraisal period, the IQ\_XE SySAM license does not expire. However, the IQ\_XE license restricts the aggregated size of all IQ main dbspaces to a size of 5GB or less, and does not allow you to add any other incremental license options. The SAP Sybase IQ Express Edition is not eligible for production deployment and is not supported by SAP Sybase Customer Service and Support (CS&S).

## Single Application Edition (SA)

SAP Sybase IQ Single Application Edition requires a CPU license.

**Table 4. Single Application Edition.**

Orderable License	Actual License	Required	Optional	Description
CPU	IQ_CORE	•		Licenses the number of cores (not CPUs) which an IQ server can use.

**Note:** Other limits set by the SA license

- Total cores per server  $\leq 64$  (MAXCP)
- Total number of user tables  $\leq 25$  (MT)
- Total number of columns  $\leq 100$  (MV)
- Total number of mpx nodes  $\leq 1$  (MSN)

## Before You Generate Your License

Follow these steps before you generate your license.

### Read the SySAM Documentation

Review the SySAM documentation for specific information about SySAM licensing, license models, and procedures.

- *Sybase Software Asset Management (SySAM) 2 Users Guide* introduces asset management concepts and provides instructions for establishing and administering SySAM 2 licenses.
- *SySAM 2 Quick Start Guide* tells you how to get your SySAM-enabled SAP Sybase product up and running quickly.
- *FLEXnet Licensing End User Guide* explains FLEXnet Licensing for administrators and end users and describes how to use the tools which are part of the standard FLEXnet Licensing distribution kit from SAP Sybase.

## Decide On the License Model You Want To Use

A license model refers to the way you set up your license files for your licensed programs. License files can reside on a central, networked license server in a served license model or on the machine running the licensed program in an unserved license model.

Decide on the license model you want to use before you generate your license file. For information about served and unserved licenses, and which model is best suited for your environment. See the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

## **Get Your Host ID**

To install or use a license server, you need the license server host ID.

FLEXnet Licensing uses different machine identifications for different machine architectures. If you have a copy of the FLEXnet licensing utilities installed, you can use the `lmhostid` utility to print the exact host ID that FLEXnet Licensing expects to use on any given machine. `lmutil` is included in your product distribution, or you can download a copy from the FLEXnet Publisher download page at: [http://www.globes.com/support/fnp\\_utilities\\_download.htm#unixdownload](http://www.globes.com/support/fnp_utilities_download.htm#unixdownload)

You can also use a system-level command to find the host ID. For platform-specific commands and examples, see Hostids for FLEXnet Licensing-Supported Platforms at: <http://www.flexerasoftware.com/products/flexnet-publisher/requirements.htm>.

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**Note:** Some platforms derive the host ID from the network adapter address. If your machine has multiple network adapters, the command you use to get the host ID may return one host ID for each network adapter. If this occurs, choose only one from the list of host IDs. Use the value associated with the primary wired Ethernet adapter. Do not use values associated with internal loopback adapters.

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## **Determine the Host Name**

You must specify the host name of the license server for served licenses. Although the host name is optional for unserved license models, providing the host name for all license types can simplify future license administration tasks.

## **Choose a Port Number**

If you plan to install a license server or use an existing license server, you need to know the TCP/IP port number that the license server will use to serve your licenses.

If you do not specify a port number, the license server uses the first available port in the range of 27000 to 27009. If you are using three-server redundancy, specify a port number outside of this range.

## **Generating a SySAM License**

Login to SAP Sybase Product Download Center or SAP Service Marketplace. Refer to the Web key or email you received for information about your account.

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

- Before you generate your license, you need the host ID and host name of the server where you plan to install SAP Sybase IQ.

- Served licenses require a license server. If you do not plan to use an existing license server, you must install one before you install SAP Sybase IQ.
1. Start your browser, and do one of the following:
    - If you purchased your product from SAP Sybase or authorized SAP Sybase reseller:  
Log in to the SAP Sybase Product Download Center at: <https://sybase.subscribenet.com> to generate license keys for SAP Sybase products that use SySAM 2-based licenses.
    - If you ordered your product under an SAP contract and were directed to download from SAP Service Marketplace:  
Log in to the SAP Service Marketplace at: <http://service.sap.com/licensekeys> to generate license keys for SAP Sybase products that use SySAM 2-based licenses.
  2. Follow the online instructions.
  3. Save your license to a temporary location on the local file system. You must save the license file with a `.lic` extension.

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**Note:** The process you use to generate license keys on the Sybase Product Download Center at: <https://sybase.subscribenet.com> depends on whether you purchased your product directly from Sybase, or from a Sybase reseller.

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## Installing a New License Server

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The SAP Sybase IQ Server Suite installation media includes SySAM Network License Server utilities you can use to install a new license server.

### Prerequisites

- Stop any servers currently running in the installation directory.

### Task

1. Insert the installation media into the drive.  
If the installer does not start automatically, mount the drive, then enter:  

```
<DVD_mount_directory>/setup.bin
```
2. On the Welcome screen, click Next.
3. Choose an installation directory, then click Next.
4. Choose Custom as the installation type you want to perform, click Next.
5. Unselect all installation options except SySAM License Utilities.
6. Select SySAM License Server, click Next.
7. Review the installation summary, then click Install.

# Starting a License Server

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Copy your license to the license directory, and start the license server from a console or command line.

1. From a console or command line, copy the license file you generated to the `$SYBASE/SYSAM-2_0/licenses` directory on the network license server.
2. Change to `$SYBASE/SYSAM-2_0/bin` , then refresh or restart the license server:

<b>sysam start</b>	Start the license server.  Perform this step if the license server is not running. After you perform this step, repeat step 2 to verify that the server is running.
<b>sysam reread</b>	Make the license server read the new license file.  Perform this step if the license server is already started.

3. To verify that the license server is running, enter `sysam status`.

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**Note:** The SySAM License Server Installer installs both IPv4-only and IPv4/IPv6 dual-stack license server binaries during installation and configures use of IPv4-only binaries.

Use the **sysam configure** [IPv6 | IPv4] to configure the appropriate version of the license server. For example, **sysam configure IPv6** will configure use of the IPv4/IPv6 dual stack binaries. For more information, see *SySAM Users Guide*.

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# Server Installations

Read this section for step-by-step server installation instructions.

## Sybase Accounts

Create a Sybase account to provide consistent ownership and privileges for all installation, configuration, and upgrade tasks.

The `sybase` user must have privileges from the top (or root) of the disk partition or operating system directory down to the specific physical device or operating system file. If you have already installed other SAP Sybase software, the `sybase` user may already exist. If so, verify that you can log in to the machine using this account.

If there is no `sybase` account on your system, see your operating system documentation for instructions about creating new user accounts.

## Server Components

Server components are grouped by feature. Items marked as default are installed in typical installations. Optional items can be installed in custom installations.

**Table 5. SAP Sybase IQ Server Components.**

Feature	Components	De- fault	Notes
SAP Sybase IQ	SAP Sybase IQ Server	•	Installs server software, client tools, ODBC drivers, and Web application development tools.
	SAP Sybase IQ Client	•	
	SAP Sybase IQ Web Drivers	•	Additional Connectivity Language Modules support character sets for Eastern Europe, Turkey, and Greece.
	SAP Sybase IQ ODBC Driver	•	
SAP Control Center	Management User Interface for SAP Sybase IQ	•	SAP Control Center (SCC) is a Web-based administrative console for Sybase products. At least one SCC server is required to deploy SAP Control Center.
	Remote Command and Control Agent for SAP Sybase IQ	•	SAP Control Center Agent is required to manage SAP Sybase IQ servers within SAP Control Center.

Feature	Components	De- fault	Notes
jConnect	jConnect 7.0 for JDBC	•	jConnect is a Type 4 JDBC driver, which is entirely Java-based. jConnect 7.0 is JDBC 4.0 compliant
SySAM	SySAM License Server		Installs FLEXnet Licensing utilities to support your licensing model.
	SySAM License Utilities	•	

## What a Server Installation Does

A typical installation installs the server and other components into a parent directory on the host machine.

### *Directory Variables*

SAP Sybase IQ uses environment variables that point to different installation directories.

**Table 6. Directory Variables.**

Variable	Description
<i>\$SYBASE</i>	Points to the parent installation directory. This variable is set by the installer.
<i>\$IQDIR16</i>	Points to the product installation directory. This variable is set with a shell command after you run the installer.

**Note:** Do not install SAP Sybase IQ into a destination directory or path that contains spaces. The GUI installer warns you if you try to install to an invalid path; other installation methods do not display this warning.

### *Parent Installation Directory*

The *\$SYBASE* directory contains the files, scripts, and other objects required to support the server.

**Table 7. Parent Installation Directory.**

Directory	Contents
charsets	Character sets available for compatibility with Adaptive Server Enterprise.
collate	Collation sequences available for compatibility with Adaptive Server Enterprise.



Directory	Contents
config	Various configuration files.
IQ-16_0	Subdirectories, scripts, and property files required to run the server.
jConnect-7_0	JDBC 4.0 compliant driver for SAP Sybase IQ.
jre	Java runtime environment.
jutils-3_0	Version 3.0 Java-based utilities, including Ribo, a Tabular Data Streams utility.
locales	Language modules for system messages and date/time formats.
log	Installation log files.
OCS-15_0	Open Client tools and utilities.
SCC-3_3	SAP Control Center startup and configuration files.
shared	Objects and libraries shared by other components, including the Java Runtime Environment (JRE).
Sybase_Install_Registry	Server registry file that holds information related to the installed products. Do not modify.
sybuninstall	Subdirectories for scripts that uninstall SAP Sybase IQ and SySAM.
SYSAM-2_0	SySAM licenses and utilities. This directory contains three subdirectories: <code>bin</code> , <code>licenses</code> , and <code>log</code> .
ThirdPartyLegal	Third party license terms and agreements.

### *Product Installation Directory*

*\$IQDIR16* is a *\$SYBASE* subdirectory that contains the files, scripts, and other objects required to run the server.

**Table 8. Product Installation Directory.**

Directory	Contents
bin64<platform>	Utilities you use to start and manage your server.
demo	Sample data and scripts for the demo database.
install	Installation history file.
java	Different JAR files.
lib64	Various library files.

Directory	Contents
logfiles	SAP Sybase IQ writes log files to this directory.
lsunload	Local Store Unload utility.
res	Character encoding resource files.
samples	Sample SAP SQL Anywhere tools and scripts.
scripts	Sample scripts and stored procedures.
sdk	Subdirectories for various language utilities.
shared	Objects and libraries shared by other components, including the Java Runtime Environment (JRE).
Sysam	Local SySAM configuration information.
tix	Tcl/Tk extension library.
unload	Various unload scripts, files, and utilities.

## SAP Control Center

---

SAP Control Center is a Web-based administrative console, which lets you manage and monitor SAP Sybase IQ in a graphical environment.

SAP Control Center (SCC) includes a Management User Interface, Remote Command and Control Agent, and Web client. The Management User Interface, or SCC server, manages communication between the SCC agent and client. The SCC agent is installed with the SAP Sybase IQ server, and continually broadcasts information about the server to subscribing clients via the SCC server. Messages from an SCC client pass through the SCC server to the agent, which in turn, processes the request on the SAP Sybase IQ server.

SCC activities range from simple resource monitoring to complete database administration. Specific user activities are determined by the role assigned to the user initiating the request.

### *Server Deployment*

A single SCC server can monitor up to 100 resources. (The number of resources one SCC server can effectively monitor depends on the complexity of the monitored resources, the frequency of data collection, the number of concurrent SCC users, and the hardware configuration of the host on which SCC is running.) To monitor more than 100 resources, install additional SCC servers and distribute the resources among them. The monitoring limit applies whether you install SCC on the same machine as a managed server or on a dedicated machine.

*Installation locations*

SCC may collect and store performance data for every server it monitors. Because data collection can use significant quantities of CPU cycles, disk space, and network resources, SCC can affect the performance of other servers sharing the same host machine. Choose your installation location carefully before installing an SCC server on the same host as a managed server in a production environment.

**Table 9. SCC Installation Locations.**

Location	Description
Dedicated SCC Host	Installing an SCC server on a dedicated host lets you manage all SAP Sybase IQ servers from a single location. This method is recommended for production environments.
Shared SCC and SAP Sybase IQ Host	Installing an SCC and SAP Sybase IQ server on the same host. This deployment method is suitable for test environments, but not recommended for production.
Existing SCC server	Unless the current SCC server is approaching the resource limit or requires an upgrade, a separate SCC server installation may not be necessary.

If you install SCC on the same machine as an SAP Sybase IQ server, consult the system requirements for both SCC and the SAP Sybase IQ server and make sure that the host machine provides ample CPU, RAM, disk, and network resources for both products. The resources required by an SAP Sybase IQ server vary a great deal based on the server's configuration, as do the resources required by SCC. In general, SCC uses more resources to manage more complex servers. SCC also uses more resources when it is configured to run more frequent data collections.

---

**Note:** For additional SCC installation options, see:

- *SAP Control Center Installation Guide* – provides complete installation, configuration, and troubleshooting procedures. This document is available on the Web at: <http://infocenter.sybase.com/help/topic/com.sybase.infocenter.dc01002.0327/doc/html/title.html>.
  - *SAP Control Center for SAP Sybase IQ* – includes SAP Sybase IQ configuration procedures, user assistance, and troubleshooting information.
-

## **SCC Installation Scenarios**

Review these SCC deployment scenarios to determine which SAP Sybase IQ installation method to use and when.

### *Dedicated SCC Host*

Install SCC and SAP Sybase IQ servers on separate hosts in a production environment.

1. Start the SAP Sybase IQ Installer in GUI or Console mode on the SAP Sybase IQ host.
2. Run a **Custom Install**.
3. Unselect the **Management User Interface for Sybase IQ** option, then complete the installation.
4. Start the SAP Sybase IQ Installer in GUI or Console mode on the SCC host.
5. Run a **Custom Install**.
6. Unselect all installation options, except the **Management User Interface for Sybase IQ** option, then complete the installation.

### *Shared SCC and SAP Sybase IQ Host*

In a test environment, you may want to install SAP Sybase IQ and SCC on the same host.

1. Start the SAP Sybase IQ Installer in GUI or Console mode.
2. Run a **Typical Install**.
3. Follow the instructions on the screen.

### *Shared SCC Server*

To use an existing SCC server for SAP Sybase IQ.

1. Start the SAP Sybase IQ Installer in GUI or Console mode.
2. Run a **Custom Install**.
3. Unselect the **Management User Interface for Sybase IQ**.
4. Click **Next**, and then follow the instructions on the screen.

## **SCC Installation Options**

Review these settings and options before you install SCC.

### *SAP Control Center (SCC) Authentication*

Initial passwords for SCC administrator and SCC agent are set in the SAP Sybase IQ installer. SCC passwords must have at least 6 characters.

Role	Requirements
SCC Administrator	SCC Administrator is a preconfigured login with access to all SCC administration features. The default SCC Administrator user name is <i>sccadmin</i> .

Role	Requirements
SCC Agent User	SCC Agent User name for authentication of the agent. The default SCC Agent User name is <i>uafadmin</i> .

### Network Ports

SCC uses TCP ports for a variety of services. You can choose new RMI, HTTP, or HTTPS port numbers in the installer if the default ports are unavailable.

**Table 10. SAP Control Center Port Numbers.**

Port Name	Default Port Number	Required?	Description
RMI	9999	Yes	SCC server port used for RMI protocol access.
HTTP	8282	Yes	SCC server port used for HTTP Web access to the server. All HTTP traffic is redirected to the secure HTTPS channel.
HTTPS	8283	Yes	SCC server port used for secure HTTPS Web access to the server. All HTTP traffic is redirected to the secure HTTPS channel.
Database	3638	Yes	SCC server repository database port; used by several services.
Messaging Service	2000	Yes	SCC server messaging port.
Tds	9998	No	SCC server port used for Tabular Data Stream™ (TDS) protocol access.
Jini Http	9092	No	Jini HTTP port for Jini discovery services.
Jini Rmid	9095	No	Jini RMID server port for Jini discovery services.
Ldap	389	No	LDAP discovery service adaptor port.

### SCC Server Start Up Option

If you install an SCC server, the SAP Sybase IQ installer includes an option that lets you start the server from within the installer.

### Additional Information

- SAP Control Center Installation Guide > Planning Your Installation > System Requirements

- SAP Control Center Installation Guide > Planning Your Installation > SCC Network Ports

## Other SAP Sybase IQ Installation Options

---

Installing a licensed copy of SAP Sybase IQ Server Suite includes configuration options not available in the evaluation edition.

### *License Keys*

The license you downloaded from the *SAP Sybase Product Download Center* or *SAP Service Marketplace* Web site contains the license key(s) for your software.

Option	Action
Specify License Keys	Browse to the location of license file and choose the license file.
Use License Server	Identify the license server <b>Host Name</b> and <b>Port Number</b> .
Install without License Key	Click <b>Continue installation without a license key</b> .  If you don't specify a license, you can continue to install without a license, but you must obtain the required license key(s) within 30 days or the server will stop functioning.

### *Email Alerts*

To configure email alerts, you must provide:

- SMTP server host name
- SMTP server port number
- Sender email
- Recipient emails (for multiple recipients, separate each email address with a comma)
- Message severity for email alerts (Information, Warning, Error)

## Installing Server Software

---

Server installation media supports GUI, console, and unattended (silent) installs.

### Installing in GUI Mode

Use this option to set up your software in a graphic user interface (GUI) environment. The GUI installer is wizard-driven and supports all product editions and installation types.

### **Prerequisites**

If you are installing the LinuxAMD64 image on a Red Hat machine, you must remount the drive to set the appropriate permissions for the installer to run properly.

## Task

1. Insert the installation media into the drive.

To install the LinuxAMD64 image on a Red Hat machine:

- a) Click Cancel to stop the installer.
- b) Enter one of these commands to remount the drive:
  - `mount -t iso9660 /dev/hda /mnt/cdrom`
  - `mount -o exec /dev/cdrom /media`

2. Start the installer:

If the installer does not start automatically, enter:

```
<DVD_mount_directory>/setup.bin
```

3. Follow the instructions on the screen.
4. Unmount, if necessary, and remove the installation media from the drive.

## Installing from the Command Line

Choose a command-line installation if you prefer a non-GUI interface or for developing custom installation scripts. Installing components in console mode is similar to installing in GUI mode, except that you run the installer from the command line, and enter text to select the installation options.

### Prerequisites

If you are installing the LinuxAMD64 image on a Red Hat, you must remount the drive to set the appropriate permissions for the installer to run properly.

## Task

1. Insert the installation media into the drive.

If the installation program launches automatically, click Cancel to stop the installer.

To install the LinuxAMD64 image on Red Hat, enter one of these commands to remount the drive:

- `mount -t iso9660 /dev/hda /mnt/cdrom`
- `mount -o exec /dev/cdrom /media`

2. From a console, change to the setup directory.

The setup directory is the directory that contains `setup.bin`, `installer.properties`, and other installation files.

3. Enter:

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

4. Follow the instructions on the screen.

---

**Note:** Selecting or deselecting a product feature typically installed with SAP Sybase IQ also selects or deselects all child components associated with that feature. To select

individual components, omit the number of the main product feature, and choose the child components you want to install.

---

### **Installing in Unattended (Silent) Mode**

Unattended or silent installations are typically used to update multiple systems. Except for the absence of the GUI screens, all actions of InstallAnywhere are the same, and the result of an installation in silent mode is exactly the same as one done in GUI mode with the same responses.

#### **Prerequisites**

A response file is a text file that contains installation options. You can override or edit the default response file, `installer.properties`, for use in subsequent installations. To override the default installation options, use the **-f** argument to point to a custom response file.

To create a response file:

1. From the command line, enter:

```
setup.bin -r <responseFileName>
```

Where *<responseFileName>* includes the absolute path and file name of the response file.

2. Run the installer in GUI mode to record your actions in the response file. Use an editor to change any responses for subsequent installations, if necessary.

If you are installing the LinuxAMD64 image on a Red Hat 5.x machine, you must remount the DVD/CD drive to set the appropriate permissions for the installer to run properly.

#### **Task**

1. Insert the installation media into the drive.

If the installation program launches automatically, click Cancel to stop the installer.

To install the LinuxAMD64 image on a Red Hat 5.x machine, enter one of these commands to remount the drive:

- `mount -t iso9660 /dev/hda /mnt/cdrom`
- `mount -o exec /dev/cdrom /media`

2. From a console, change to the setup directory.

The setup directory contains `setup.bin`, `installer.properties`, and other installation files.

3. Enter:

```
setup.bin -f <responseFileName> -i silent  
-DAGREE_TO_SYBASE_LICENSE=true  
-DSYBASE_PRODUCT_LICENSE_TYPE=license
```



**Table 11. Response File Arguments.**

Argument	Description
-f <responseFileName>	Optional argument that includes the absolute path and file name of the response file. If you omit this argument, the installer defaults to <code>installer.properties</code> or other <code>.properties</code> file in the same installation directory.
-i silent	Switch that starts the silent installer.
-DAGREE_TO_SYBASE_LICENSE=true	Argument that indicates you accept Sybase end-user license agreement.
-DSYBASE_PRODUCT_LICENSE_TYPE=license	Required to install a licensed version of the software.
-DUNINSTALL_DELETE_DATA_FILES=true	Deletes unnecessary files after installation.

## **Setting the Environment Variables**

Set the environment variables required to run the server. The shell scripts that set these variables also set the variables needed by Open Client.

Do one of the following:

- For the tcsh or C (csh) shell, enter:

```
source $SYBASE/IQ-16_0/IQ-16_0.csh
```

- For the Korn (ksh), Bash, or Bourne (sh) shells, enter:

```
.$SYBASE/IQ-16_0/IQ-16_0/IQ-16_0.sh
```

## **Install Logs**

The installer writes a general log that records all installation activity and individual logs for each installed component. If an installation problem occurs, start with the `IQ_Suite.log`, then refer to the component log for specific details.

The installer also creates a set of corresponding `.out` files for each component `.log` file. These files capture different component installation activities. If the installer runs normally, these files may remain empty.

**Table 12. SAP Sybase IQ Log Files.**

File Name	Contents
<code>conn_add_lang.log</code>	Additional Connectivity Language Modules
<code>conn_lang.log</code>	Connectivity Language Modules

File Name	Contents
iq_agent.log	SAP Sybase IQ Agent Plug-in
iq_client_common.log	Client components
iq_client_ms.log	Windows client components
iq_client_web.log	Web Drivers
iq_odbc.log	ODBC Driver
iq_server.log	Server components
iq_shared.log	Shared SAP Sybase IQ Configuration files
IQ_Suite.log	SAP Sybase IQ Server Suite installation summary
IQ_Suite_Variable_Reference.log	InstallAnywhere installation variables
jconnect7.log	jConnect7 installation summary
jre6.log	Java Runtime Environment v6 installation
jre7.log	Java Runtime Environment v7 installation
lang.log	Language Modules
open_client.log	Open Client installation summary
scc_server.log	SAP Control Center installation summary
sysam_util.log	SySAM License Utilities installation summary

## Solutions to Common Installation Problems

Check this section for solutions to common installation issues.

**Table 13. Troubleshooting installation problems**

Problem	Possible Cause and Solution
Install fails	<p>Check the installer log: \$SYBASE/log/IQ_Suite.log</p> <p>The install log can help you trace the install progress and troubleshoot failed installations. The installer also writes individual logs for components included as part of the install to this directory.</p>

Problem	Possible Cause and Solution
The installer reports: gzip: "Not Found"	<p>The installer cannot find the path to the <code>gzip</code> file. <code>gzip</code> must be installed and referenced in the path for the installer to succeed.</p> <p>The installer expects to find <code>gzip</code> in the <code>/usr/bin</code> directory. On some machines, <code>gzip</code> is located in the <code>/usr/contrib/bin/</code> directory. If this is the case, update the path and run the installer.</p>
\$SYBASE variable not defined	<p>Use these shell commands to set the \$SYBASE environment variable to the path of the SAP Sybase IQ parent installation directory.</p> <p>For the tcsh or C shell (csh):</p> <pre>setenv SYBASE &lt;directory name&gt;</pre> <p>For the Korn (ksh), Bash, or Bourne (sh) shells:</p> <pre>SYBASE=&lt;directory name&gt;; export SYBASE</pre>

## Uninstalling SAP Sybase IQ

To uninstall SAP Sybase IQ on UNIX-like operating systems, run the uninstaller from a console or terminal. Instructions apply to server and client software.

1. Open a terminal, change to:

```
$SYBASE/sybuninstall/IQSuite
```

2. Enter:

<b><code>./uninstall</code></b>	Starts the uninstaller in GUI mode.
<b><code>./uninstall -i silent</code></b>	Starts the uninstaller in silent mode.

### Note:

- For GUI uninstalls, follow the instructions on the screen.
- For silent uninstalls, the uninstaller does not delete user files by default. To delete user files, pass the `-DUNINSTALL_DELETE_DATA_FILES=true` flag as part of the `uninstall -i silent` command.



# Testing Installed Products

This section tells you how to start SAP Sybase IQ and use the demo database to test your installation.

## Demo Database

Many of the examples throughout the documentation use the demo database (`iqdemo.db`) as a data source. The demo database is installed as part of the SAP Sybase IQ Server Suite and resides on the server. Client access is provided by tools installed as part of the SAP Sybase IQ Client Suite.

## Starting the Demo Database

Use the demo database to test your installation.

1. Open a terminal, source the SAP Sybase IQ environment.

```
$IQDIR16/demo
```

3. Enter:

```
mkiqdemo.sh
```

4. To start the demo database, enter:

```
start_iq @iqdemo.cfg iqdemo.db
```

## Table Names

Demo database table names and owners.

**Table 14. Demo database table names**

Table Name	Owner
Contacts	GROUPO
Customers	GROUPO
Departments	GROUPO
Employees	GROUPO
FinancialCodes	GROUPO
FinancialData	GROUPO

Table Name	Owner
Products	GROUPO
SalesOrderItems	GROUPO
SalesOrders	GROUPO
empl	DBA
iq_dummy	DBA
sale	DBA

## Running SAP Sybase IQ Server

Use the startup utility, **start\_iq**, to start your server. **start\_iq** is a command line utility that runs on all platforms and ensures that all required parameters are set correctly.

### Starting a Server or Database

To use **start\_iq** to start a server or database, change to a directory where you have write privileges, and use the following command format:

```
start_iq [ server-options ] [ database-file
[ database-options ], ...]
```

- *server-options* include the database server name and other options that control the behavior of the server, for all databases that are running on that server.
- *database-file* is the file name of the catalog store. You can omit this option, or enter one or more database file names on the command line. Each of these databases is loaded and available for applications. If the starting directory contains the database file, you do not need to specify the path; otherwise, you must specify the path. You need not specify the .db file extension.
- *database-options* are options that you can specify for each database file you start, that control certain aspects of its behavior.

### Default Startup Parameters

**start\_iq** uses a default configuration file (\$IQDIR16/scripts/default.cfg) to set the default start-up parameters.

**Table 15. Parameters set by start\_iq**

Parameter	Value	Description
-c	48MB	Catalog store cache size.
-gc	20	Checkpoint interval.

Parameter	Value	Description
-gd	all	Allows all users to start the database by connecting.
-gl	all	Allows all users to load or unload tables.
-gm	10	Default number of connections.
-gp	4096	Catalog store page size.
-ti	4400	Client timeout set to 72 hours. Prevents users with long queries from being logged off over a long weekend.

**Note:** If SAP SQL Anywhere is installed on the same subnet as SAP Sybase IQ, the server must have a unique name. Both SAP SQL Anywhere and SAP Sybase IQ servers default to the port **2638**.

Use a new port number for each server. Set each new port number in the `$IQDIR16/scripts/default.cfg` file. Change the following line in each IQ database configuration file (for example, `$IQDIR16/demo/iqdemo.cfg`) to update the port number:

```
-x tcpip{port=2638}
```

### Configuration Files

To override the default start-up parameters, store your options in a configuration file.

To start a server with a configuration file, use this syntax:

```
start_iq @configuration_filename.cfg dbname.db
```

This command starts the database and sets parameters named in the (optional) configuration (`.cfg`) file.

On the **start\_iq** command line, the last option you specify takes precedence, so to override your configuration file, list any options you want to change *after* the configuration file name. For example:

```
start_iq @iqdemo.cfg -x 'tcpip{port=1870}' iqdemo.db
```

The **-x** parameter here overrides connection information in the `iqdemo.cfg` file.

A configuration file for the demo database (`iqdemo.cfg`) is installed in the `$IQDIR16/demo` directory as an example.

### Default Server Directories

The directory where the server is started becomes the default directory for all server files created by SAP Sybase IQ.

**Note:** If you run the **start\_iq** utility from `$IQDIR16/bin64`, the script changes the directory to `./.` to avoid creating database files in the `/bin` directory.

### *Startup and Server Logs*

SAP Sybase IQ writes start-up and server logs in the `$IQDIR16/logfiles` directory:

- Startup information is saved in the `servername.nnnn.stderr` file.
- Server status is logged in the `servername.nnnn.srvlog` file.

The *nnnn* variable in the file name indicates the number of times the server has been started. For example, `localhost.0004.srvloglocalhost_iqdemo.0006.srvlog`.

### *Additional Information*

*Utility Guide > start\_iq Database Server Startup Utility > start\_iq Server Options*

## Stopping Servers

---

SERVER OPERATOR system privilege is the default permission level required to stop a server, but you can use the **-gk** startup option to change the default to ALL or NONE. Setting the permission level to ALL lets all users stop the server; setting the permission level to NONE means that no one can stop the server. In a production environment, only the Server Operator should be allowed to stop the database server.

Do not shut down a server while it is still connected to one or more clients. If you try this, you get a warning that any uncommitted transactions will be lost. Disconnect or close all the clients and try again.

### *Server Shutdown Commands*

Several commands shutdown the database server.

Command	Description
stop_iq	Shuts down a server completely without regard for users, connections or load process status. Syntax: <code>stop_iq [ options ]</code>
dbstop	Stops a server or database. Additional options let you stop a server, even if there are active connections.  Syntax: <code>dbstop [ options ] server-name</code>  To use <b>dbstop</b> to stop a server, you must specify a <b>server-name</b> , as well as any connection parameters you specified when you started the server.



Command	Description
STOP ENGINE	<p><b>STOP ENGINE</b> is a SQL statement that stops a database server.</p> <p>Syntax:</p> <pre>STOP ENGINE engine-name [ UNCONDITIONALLY ]</pre> <p>The <b>UNCONDITIONALLY</b> argument stops a database server, even if there are client connections to the server.</p>

### Server Shutdown Methods

There are several methods to shut down or stop a server.

To stop the server from..	Do this...
Command line	Run the <b>stop_iq</b> or <b>dbstop</b> commands.
Interactive SQL	Run the <b>stop engine</b> command to to stop a named database server.

### Stopping Servers in Cron or At Jobs

To use **stop\_iq** in a **cron** or **at** job, specify the full path name to the **stop\_iq** executable and the appropriate **-stop** option:

```
$SYBASE/IQ-16_0/bin64/stop_iq -stop one
```

Setting **-stop one** shuts down a single server, when exactly one running server was started by the user ID that starts the **cron** or **at** job. This prevents accidentally shutting down the wrong server if several are running.

```
$SYBASE/IQ-16_0/bin64/stop_iq -stop all
```

Setting **-stop all** shuts down all servers that were started by the user ID that starts the **cron** or **at** job.

### Additional Information

- *Reference: Statements and Options > SQL Statements > STOP ENGINE Statement*
- *Utility Guide > Stopping the Database Server*
- *Administration: Database > Run Database Servers > Database Server Shutdown*

## Starting and Stopping the Sybase Control Center Agent

(Optional) Launch or shut down the SAP Sybase Control Center agent included with your SAP Sybase IQ.

SAP Control Center is a Web-based tool for managing and monitoring SAP Sybase servers, including SAP Sybase IQ single-node and multiplex servers. One SCC server can manage and

## Testing Installed Products

monitor all the SAP Sybase IQ servers in your enterprise. SCC performs management tasks using the SCC agent, which is installed with each SAP Sybase IQ server.

For instructions on installing SCC, see the *SAP Sybase Control Center Installation Guide*. For instructions on setting up the SCC agent to run as a service, starting and stopping the SCC agent service, and running the SCC agent from the command line, see SAP Control Center online help. SAP Control Center documentation (including the installation guide and online help) is available at <http://sybooks.sybase.com/nav/summary.do?prod=10680>.

1. Use the **scc** script to start the SCC agent.  
`$SYBASE/SCC-3_3/bin/scc.sh`
2. Connect to the SAP Control Center server. In your Web browser, enter: `https://scc-hostname:8283/scc`.
3. Log in.  
When logging in to a newly installed SAP Control Center for which secure authentication has not been configured, use the `sccadmin` account—the password is set during installation. For more information, see the *SAP Sybase Control Center Installation Guide*.
4. In SCC, register and authenticate your SAP Sybase IQ SCC agent.
5. (Optional) Stop the SCC agent. To shut down from the `scc-console>` prompt, enter `shutdown`.

If you use SCC to manage your SAP Sybase IQ server, leave the SCC agent running whenever SAP Sybase IQ is running. The easiest way to do this is to run the SCC agent as a service that restarts automatically.

## Running Interactive SQL

---

Interactive SQL is a utility that ships with SAP Sybase IQ that lets you execute SQL statements, build scripts, and display database data.

To use Interactive SQL to run a sample query, the demo database must be up and running. The connection parameters in this procedure use default login credentials and assume that `iqdemo` is running locally. If you installed `iqdemo` in another location or changed the default login, use those values instead.

1. Open a console, and run **dbisql** from the `$IQDIR16/bin64` directory.
2. On the **Connect** dialog, enter:

Tab Name	Field	Value
Identification	Authentication	Database

Tab Name	Field	Value	
	User ID	DBA or dba (case-insensitive)	
	Password	sql (case-sensitive)	
	Action	Connect to a running database on this computer	
	Server name	<localhost>_iqdemo	
	Database name	iqdemo	
Network	TCP/IP protocol options	Host	<localhost>
		Port	2638

3. In the **SQL Statements** window, enter:

```
SELECT * FROM Employees
```

4. Press **F9** to run the query.

---

**Note:** Interactive SQL uses the deprecated iAnywhere JDBC driver.

---

## Post-Installation Tasks

---

Perform these tasks after you install and test SAP Sybase IQ.

### Verify Your License

Connect to the server and run **sp\_iqlmconfig** to verify your license.

To verify your license, connect to the server, and run the **sp\_iqlmconfig** stored procedure in Interactive SQL (**dbisql**). To verify the license from a custom license installation, check the \$SYBASE/SYSAM-2\_0/log/SYBASE.log file. You can use iqdemo.db to perform this task.

A line that begins with "Checked out license..." indicates a successful license configuration. If you see a "Sysam: FLEXnet Licensing error:" message, check with your SAP Sybase representative to resolve the issue.

#### *Additional Information*

*Troubleshooting SySAM* section and the *SySAM 2 Users Guide*.

### Change the Default Connection Parameters

Change the default connection parameters to protect your system against unauthorized access.

Do not rely on the default connection parameters to secure your database against unauthorized access. Change these parameters to protect your data.

**Table 16. Default Connection Parameters**

Parameter	Default Value
User ID	<b>DBA</b> or <b>dba</b> (case insensitive)
Password	<b>sql</b> (case sensitive)
Port Number	<b>2638</b>

*Additional Information**Administration: Database > Security Overview***Remove Sample Application Files**

Before you deploy your server in a production environment, remove the sample client applications.

The SAP Sybase IQ Server Suite installation includes several directories that contain sample client applications, which are included for training purposes only. Remove these sample directories before you deploy your server in a production environment:

- \$IQDIR16/samples
- \$IQDIR16/sdk

# Client Installations

Installing client components lets you connect a client to a network server.

## Client Components

Client components are grouped by feature. Items marked as default are installed in a typical installation. Optional items can be installed in a custom installation.

**Table 17. SAP Sybase IQ Client Components.**

Feature	Components	De- fault	Notes
SAP Sybase IQ	SAP Sybase IQ Client	•	Installs client software, Web application development tools, and ODBC drivers.
	SAP Sybase IQ Web Drivers	•	
	SAP Sybase IQ ODBC Driver	•	
jConnect	jConnect 7.0 for JDBC	•	jConnect is a Type 4 JDBC driver, which is entirely Java-based. jConnect 7.0 is JDBC 4.0 compliant

## What a Client Installation Does

A typical client installation installs the network client components into a parent directory on a client machine.

### *Directory Variables*

SAP Sybase IQ uses environment variables to point to different installation directories.

**Table 18. Directory Variables.**

Variable	Contents
<i>\$SYBASE</i>	Points to the parent installation directory. This variable is set by the installer.
<i>\$IQDIR16</i>	Points to the SAP Sybase IQ installation directory

*Parent Installation Directory*

The *\$SYBASE* directory contains the files, scripts, and other objects required to support the client.

**Table 19. Parent Installation Directory.**

Directory	Contents
IQ-16_0	SAP Sybase IQ client components.
jConnect-7_0	JDBC 4.0 compliant driver for SAP Sybase IQ.
shared	Shared software components.
Sybase_Install_Registry	Client component registry file.
jre	Java Runtime Environment directory.
jutils-3_0	Version 3.0 Java-based utilities, including Ribo, a Tabular Data Streams utility.
log	Client log file directory.
ThirdPartyLegal	Third-party license agreements.
sybuninstall	Subdirectories for scripts that uninstall SAP Sybase IQ and SySAM.

*Product Installation Directory*

*\$IQDIR16* is a *\$SYBASE* subdirectory that contains the files, scripts, and other objects required to run the client.

**Table 20. Product Installation Directory.**

Directory	Contents
bin<platform>	Utilities you use to start and manage your server. <platform> value is 64 or 32, depending on your installation.
install	Installation history file.
java	Different JAR files.
lib<platform>	Various library files. <platform> value is 64 or 32, depending on your installation.
res	Character encoding resource files.
samples	Sample SAP SQL Anywhere tools and scripts.
sdk	Subdirectories for various language utilities.

Directory	Contents
shared	Subdirectories for various shared components.
tix	Tcl/Tk extension library.

## Installing Client Software

---

Client installation media supports GUI, console, and unattended installations. Stop any servers currently running in the installation directory. Mount the drive, if necessary.

### Installing in GUI Mode

Use this option to set up your software in a graphic user interface (GUI) environment. The GUI installer is wizard-driven and supports all product editions and installation types.

1. Insert the installation media into the drive.

To install the LinuxAMD64 image on a Red Hat machine:

- a) Click Cancel to stop the installer.
- b) Enter one of these commands to remount the drive:
  - `mount -t iso9660 /dev/hda /mnt/cdrom`
  - `mount -o exec /dev/cdrom /media`

2. Start the installer:

If the installer does not start automatically, enter:

```
<DVD_mount_directory>/setup.bin
```

3. Follow the instructions on the screen.
4. Unmount, if necessary, and remove the installation media from the drive.

### Installing from the Command Line

Choose a command-line installation if you prefer a non-windowing interface or for developing custom installation scripts. Installing components in console mode is similar to installing in GUI mode, except that you run the installer from the command line, and enter text to select the installation options.

#### Prerequisites

If you are installing the LinuxAMD64 image on a Red Hat machine, you must remount the drive to set the appropriate permissions for the installer to run properly.

#### Task

1. Insert the installation media into the drive.

If the installation program launches automatically, click Cancel to stop the installer.

To install the LinuxAMD64 image on a Red Hat machine, enter one of these commands to remount the drive:

- `mount -t iso9660 /dev/hda /mnt/cdrom`
- `mount -o exec /dev/cdrom /media`

2. From a console , change to the setup directory.

The setup directory is the directory that contains `setup.bin`, `installer.properties`, and other installation files.

3. Enter:

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

4. Follow the instructions on the screen.

### **Installing in Unattended (Silent) Mode**

Unattended or silent installations are typically used to update multiple systems. Except for the absence of the GUI screens, all actions of InstallAnywhere are the same, and the result of an installation in silent mode is exactly the same as one done in GUI mode with the same responses.

#### **Prerequisites**

A response file is a text file that contains installation options. You can override or edit the default response file, `installer.properties`, for use in subsequent installations. To override the default installation options, use the `-f` argument to point to a custom response file.

To create a response file:

1. From the command line, enter:

```
setup.bin -r <responseFileName>
```

Where `<responseFileName>` includes the absolute path and file name of the response file.

2. Run the installer in GUI mode to record your actions in the response file. Use an editor to change any responses for subsequent installations, if necessary.

If you are installing the LinuxAMD64 image on a Red Hat machine, you must remount the DVD/CD drive to set the appropriate permissions for the installer to run properly.

#### **Task**

1. Insert the installation media into the drive.

If the installation program launches automatically, click Cancel to stop the installer.

To install the LinuxAMD64 image on a Red Hat machine, enter one of these commands to remount the drive:



- `mount -t iso9660 /dev/hda /mnt/cdrom`
- `mount -o exec /dev/cdrom /media`

2. From a console, change to the setup directory.

The setup directory contains `setup.bin`, `installer.properties`, and other installation files.

3. Enter:

```
setup.bin -f <responseFileName> -i silent
-DAGREE_TO_SYBASE_LICENSE=true
-DSYBASE_PRODUCT_LICENSE_TYPE=license
```

**Table 21. Response File Arguments.**

Argument	Description
-f <responseFileName>	Optional argument that includes the absolute path and file name of the response file. If you omit this argument, the installer defaults to <code>installer.properties</code> or other <code>.properties</code> file in the same installation directory.
-i silent	Switch that starts the silent installer.
-DAGREE_TO_SYBASE_LICENSE=true	Argument that indicates you accept Sybase end-user license agreement.
-DSYBASE_PRODUCT_LICENSE_TYPE=license	Required to install a licensed version of the software.
-DUNINSTALL_DELETE_DATA_FILES=true	Deletes unnecessary files after installation.

## Setting Environment Variables

Open a terminal and set the environment variables required to run SAP Sybase IQ. The shell scripts that set these variables also set the variables needed by Open Client.

Do one of the following:

- For the tcsh or C (csh) shell, enter:

```
source $SYBASE/IQ-16_0/IQ-16_0.csh
```

- For the Korn (ksh), Bash, or Bourne (sh) shells, enter:

```
$SYBASE/IQ-16_0/IQ-16_0/IQ-16_0.sh
```

---

**Note:** For additional information about environment variables, see *Reference: Building Blocks, Tables, and Procedures > File Locations and Installation Settings > Environment Variables*.

---



# Configuration

This section outlines basic configuration concepts and procedures.

## Using Configuration Files

---

Use a configuration file to store server startup options.

The `@data` option allows you to specify environment variables and configuration files on the command line. To specify a configuration file, replace *data* with the path and name of the configuration file:

```
start_iq @configuration_filename.cfg dbname.db
```

If a startup parameter is passed from the command line and the same parameter exists in the `.cfg` file, the value in the command line overrides the value in `.cfg` file.

Configuration files can contain line breaks, and can include any set of options, including the `@data` option. Use a number sign (#) to designate lines as comments. An ampersand (&) character that appears by itself at the end of a line indicates that the previous token is continued on the next line. See the *Utility Guide* for a complete list of startup parameters.

### *Default Configuration File*

When you start a server and do not include any command line parameters or specify a configuration file, IQ retrieves the start-up parameters from a default configuration file, `default.cfg`, in the `$IQDIR16/scripts` directory. The `default.cfg` file is also the source of parameters for the Service Manager and multiplex configurations. You can maintain consistency by editing parameters in `default.cfg`.

To increase the amount of virtual memory, change the parameters in `default.cfg`. To reduce the virtual memory that other programs use, add swap space to machines or reduce IQ memory demands (cache sizes, thread count, stack size, etc.).

### *Security and Configuration Files*

You can use the **dbfhide** (File Hiding) utility to encrypt your configuration files. If you specify log file parameters (**-o logfile**) in encrypted files, the log is not available to the **start\_iq** utility. You may want to add parameters that do not require encryption on the command line or in a separate configuration file. For example:

```
start_iq @encrypt_params @other_params
```

or

```
% start_iq @encrypt_params -n myserv -c 400 -o $IQDIR16/logfile/
myserv.log
```

## Configuring Client Connectivity

---

SAP Sybase IQ supports ODBC and JDBC connectivity.

### Connecting Using ODBC

Open Database Connectivity (ODBC) is a standard API that allows a single application to access a variety of data sources through ODBC-compliant drivers.

#### ODBC Conformance

ODBC drivers manufactured by different vendors may vary widely in the functions they provide. SAP Sybase IQ supports ODBC 3.5.2.

**Table 22. ODBC Conformance Levels.**

Conformance level	Sybase IQ support
Core conformance	All core features.
Level 1 conformance	<p>All level 1 features, except for asynchronous execution of ODBC functions.</p> <p>SAP Sybase IQ does support multiple threads sharing a single connection. The requests from the different threads are serialized by SAP Sybase IQ.</p>
Level 2 conformance	<p>All level 2 features, except:</p> <ul style="list-style-type: none"> <li>• Three-part names of tables and views. This is not applicable for SAP Sybase IQ.</li> <li>• Asynchronous execution of ODBC functions for specified individual statements.</li> <li>• Ability to time out login requests and queries.</li> </ul>

---

#### Note:

- Although you can use new ODBC 3.5.x features such as descriptors in your ODBC applications, ODBC 2.x applications will continue to work with SAP Sybase IQ.
  - For more information about ODBC, see the *ODBC Programmer's Reference*, available from Microsoft Corporation as part of the ODBC software development kit, or from the Microsoft Web site at: [http://msdn.microsoft.com/en-us/library/windows/desktop/ms714177\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/windows/desktop/ms714177(v=vs.85).aspx).
-

## **Installing ODBC Drivers**

Server and client installations include ODBC drivers. Platform-specific drivers are available from the SAP Sybase Product Download Center and SAP Service Marketplace.

### ***Application Linking***

If you use an ODBC application that uses `libodbc.so (libodbc.so.1)` or `libodbcinst.so (libodbcinst.so.1)`, you can create symbolic links to that point to `$IQDIR16/lib64/libdbodbc16.so.1` for single-threaded or `$IQDIR16/lib64/libdbodbc16_r.so.1` for multi-threaded applications.

If you are creating an ODBC application, you can link directly to `libdbodbc16.so` for non-threaded applications and `libdbodbc16_r.so` for threaded applications. References to ODBC functions are resolved at run-time.

### ***32-bit and 64-bit Drivers***

UNIX 64-bit applications, including many third-party tools, can use 64-bit ODBC drivers to connect to 64-bit SAP Sybase IQ servers. 32-bit applications can use 32-bit ODBC drivers to connect to 64-bit IQ servers. (32-bit applications cannot use 64-bit ODBC drivers to connect to 64-bit IQ servers.)

The SAP Sybase IQ Network Client CD supplied with all platforms contains an ODBC driver for connecting from Windows-based ODBC applications. To connect via ODBC from 32-bit UNIX client applications, download and install the 32-bit ODBC driver kit. Check the EBF/Update information for the appropriate driver.

## **Using UNIX or Linux-Based Query Tools Through ODBC**

There are several ways to use ODBC to connect to UNIX or Linux-based Query tools.

Tools that do not require extensive driver manager services can use symbolic links to connect directly to the driver. Tools that require a driver manager may ship with a driver manager.

For information and recommendations about compatible driver managers available for specific applications, see the documentation for the application.

On UNIX-like operating systems, ODBC data sources are stored in `.odbc.ini`. Use a text editor to update this file manually, or use the cross-platform `iqdsn` utility to create an ODBC data source.

You can use files as data sources instead of databases. File data sources are stored as files with the extension `.dsn`.

### **Managing ODBC Data Sources**

On UNIX-like operating systems, ODBC data sources are stored in a system information file. Although this file is named `.odbc.ini` by default, it can have any name.

A system information file can include any connection parameter. This sample DSN connects to the demo database:

```
[My Data Source]
Userid=DBA
Password=sql
EngineName=test_server
CommLinks=tcipip(port=1870)
AutoStop=no
DatabaseName=iqdemo
DatabaseFile=iqdemo.db
```

### **System Information File Location**

SAP Sybase IQ searches the following locations, in order, for the system information file:

1. The `$ODBCINI` environment variable
2. The `$HOME` environment variable
3. The user's Home directory
4. The `$PATH` environment variable

---

**Note:** SAP Sybase IQ clients ignore these environment variables when searching for the system information file:

- `$ODBC_HOME`
  - `$ODBC_INI`
- 

### **Connecting with a Data Source Entry**

To use a data source entry to connect to your database, open a terminal, and use **dbisql** with the data source entry name in a connection string. For example:

```
% dbisql -c "dsn=sample_dsn"
```

---

**Note:** Any database started from a connection string is, by default, stopped when there are no more connections to it, and any database that is loaded from a connection string is unloaded as soon as there are no more connections to it when the Autostop connection parameter is set to yes.

---

### **Connecting without a Data Source Entry**

To connect without using `.odbc.ini`, open a terminal, and use **dbisql** all connection parameters. For example:

```
% dbisql -c "UID=DBA;PWD=sql;AutoStop=no;
ENG=<engine name>;DBF=$IQDIR16/demo/iqdemo.db"
```

This example is shown on multiple lines, however, you must enter the entire command at the command prompt on one line.

### *Additional Information*

*Utility Guide > iqdsn Database Administration Utility*

### **Command Line Connections to 32-bit Applications**

Use dbisql to connect to 32-bit applications from the command line.

To connect to a 32-bit application without using a data source, use dbisql to connect from the command line. To connect to the demo . db you would use a command similar to this:

```
dbisql -c "UID=DBA;PWD=sql;AUTOSTOP=no;
ENG=<engine name>;DBF=%ALLUSERSPROFILE%\SybaseIQ\
demo\iqdemo.db"
```

## **Connecting Using JDBC**

JDBC and jConnect provide access to SAP Sybase IQ for Java-based applications.

Java Database Connectivity (JDBC) is a Java application programming interface (API) that provides programmatic access to SAP Sybase IQ. jConnect is a SAP Sybase utility that provides high-performance native access to all SAP Sybase products as a standard installation option.

Interactive SQL (**dbisql**) can use either JDBC or ODBC connectivity.

The iAnywhere JDBC driver is the default driver for Interactive SQL.

---

**Note:** The iAnywhere JDBC driver is deprecated.

---

## **Connecting Using OLE DB**

SAP Sybase IQ includes an OLE DB provider as an alternative to ODBC. OLE DB is a data access model from Microsoft that uses the Component Object Model (COM) interfaces.

Unlike ODBC, OLE DB does not assume that the data source uses a SQL query processor. Although OLE DB requires a Windows client, you can use OLE DB to access Windows and UNIX servers

SAP Sybase IQ OLE DB support differs from SAP SQL Anywhere support. SAP Sybase IQ supports Dynamic (dynamic scroll), Static (insensitive) and Forward only (no-scroll) cursors, but does not support Keyset (scroll) cursors. In SAP Sybase IQ the isolation level is always 3, no matter what you specify.

SAP Sybase IQ supports Dynamic (dynamic scroll), Static (insensitive) and Forward only (no-scroll) cursors, but does not support Keyset (scroll) cursors. In SAP Sybase IQ the isolation level is always 3, no matter what you specify.

SAP Sybase IQ does not support Windows CE or remote updates through a cursor.

### *Additional Information*

*Programming > OLE DB and ADO Development > OLE DB Connection Parameters*

## **Connecting Using Open Client**

Clients require a server object in the interfaces file to access server properties and methods. Use the SAP Sybase IQ Directory Services Editor (dsedit) to create the interfaces file entries.

### **Prerequisites**

- You must be the owner of the SAP Sybase IQ home directory (*\$SYBASE*) to run `dsedit`.
- Make a copy of the interfaces file before you make any changes.

### **Task**

1. From a terminal or command line, change to *\$SYBASE/OCS-15\_0/bin*
2. Start **dsedit**.
3. On the **Directory Service** dialog, select a directory service to open (the interfaces file or interfaces driver is default), then click **OK**.
4. From the **Directory Service Session** dialog, choose **Add new server entry**.
5. On the **Server Entry Editor**, enter the server name, then click **Add new network transport**.
6. On the **Network Transport Editor**, select **TCP transport**, enter the host name and port number, then click **OK** to return to the **Server Entry Editor**.  
The server is now listed under **Available Network Transports**.
7. Click **OK**, then click **Close Session** on the **Directory Service Session** dialog.
8. Click **Exit** on the **Select a Directory Service** dialog.

## **Running the Client and Server On the Same System**

SAP Sybase IQ uses a shared memory segment and several semaphores for communication between the client and server on the same machine.

Shared memory is the default communications mechanism when the client and server are on the same system. Shared memory is configured automatically, and starts automatically.

### *Additional Information*

*Administration: Database > Connection and Communication Parameters*



## **Network Issues for SAP Sybase IQ Servers**

Properly configured UNIX servers run under the TCP/IP protocol, which enables non-UNIX clients to communicate with the server.

### *Verified TCP/IP Protocol Stacks*

For SAP Sybase IQ to run properly, the protocol stack on the client and server computers must be compatible at each layer. Many vendors supply TCP/IP protocol stacks and associated software. SAP Sybase IQ communications have been explicitly verified with these TCP/IP implementations:

- TCP/IP For NetWare
- Microsoft Winsock version 2.0

### *User Datagram Protocol*

There are several entries into the TCP/IP protocol stack. SAP Sybase IQ employs the User Datagram Protocol (UDP). While it is called a transport protocol here and elsewhere, UDP provides little more than a user interface to the network layer IP. In particular, UDP is not a guaranteed transmission protocol.

### *Tuning Performance Under TCP/IP*

Although the default packet size for TCP/IP is 1460 bytes, a larger packet size may improve query response time, especially for queries that transfer a large amount of data between a client and a server process. You can set the maximum packet size using the database server command lines or `CommBufferSize (CBSIZE)` in the client connection string. This option may be used with the **start\_iq** command.

## **Connecting Across a Firewall**

Set the `CommLinks` connection parameters in your application's connection string to connect across a firewall.

There are restrictions on connections when the client application is on one side of a firewall and the server is on the other. Firewall software filters network packets according to network port. Also, it is common to disallow UDP packets from crossing the firewall.

- Set the **ClientPort** parameter to a range of allowed values for the client application to use. You can then configure your firewall to allow these packets across. You can use the short form **CPort**.
- Set the **HOST** parameter to the host name on which the database server is running. You can use the short form **IP**.
- Specify the port your database server is using in the **ServerPort** parameter if it is not using the default port of 2638. You can use the short form **Port**.
- Set the **DoBroadcast=NONE** parameter to prevent UDP from being used when connecting to the server.

## Configuration

In this example, the connection string fragment:

- Restricts the client application to ports **5050** through **5060**
- Connects to a server named `myeng` running on the machine at address `myhost` using the server port **2020**

No UDP broadcast is carried out because of the `DoBroadcast` option.

```
CEng=myeng;Links=tcPIP (ClientPort=5050-5060;Host=myhost;Port=2020;DoBroadcast=NONE)
```

### *Additional Information*

*Administration: Database > Connection and Communication Parameters*

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