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Getting Started with SAP Sybase IQ Column Store Analytics Server

Lesson 2: Product Installation and Database Creation

Table of Contents

1. Introduction

This chapter discusses installing SAP Sybase IQ, verifying the installation, starting up the server and using client tools to connect to it. It will show you how to create a SAP Sybase IQ database. It will also describe the TPCH schema that you will be creating in your SAP Sybase IQ database. This schema will be the basis for the work you will be doing in subsequent chapters of this book.

Note: This book has been written as though you will download, install and use the Linux AMD 64 evaluation edition version of the software.

Note: While the version of Linux should not matter, RHEL 6.4 was used to create this guide, the working steps and for the screenshots herein. The bash shell is used as the command interpreter for shell commands.

You will need the following amount of free disk space and memory resources on a Linux machine to do the basic lessons – install IQ, create a database and load the provided data into it:

Resource	Amount
Disk space for SAP Sybase IQ installed software	700MB
Disk space for Sybase Control Center installed software	550MB
Disk space for provided data files to load into SAP Sybase IQ	1GB
Disk space for SAP Sybase IQ database	4GB (1GB for system data; 2GB for user data; 1GB for temporary data)
TOTAL disk space required (sum of the above)	6.25GB
RAM	2GB

Getting ready to install SAP Sybase IQ.

There are two ways to try out SAP Sybase IQ for free:

- Evaluation Edition: 30 day free access to all capabilities of SAP Sybase IQ, without limit to functionality or data size.
- Express Edition: a free, non-expiring version of SAP Sybase IQ. All features are supported, but there is a limit of 5GB of data that you can store in the database. **Note:** No customer support is available with this edition.

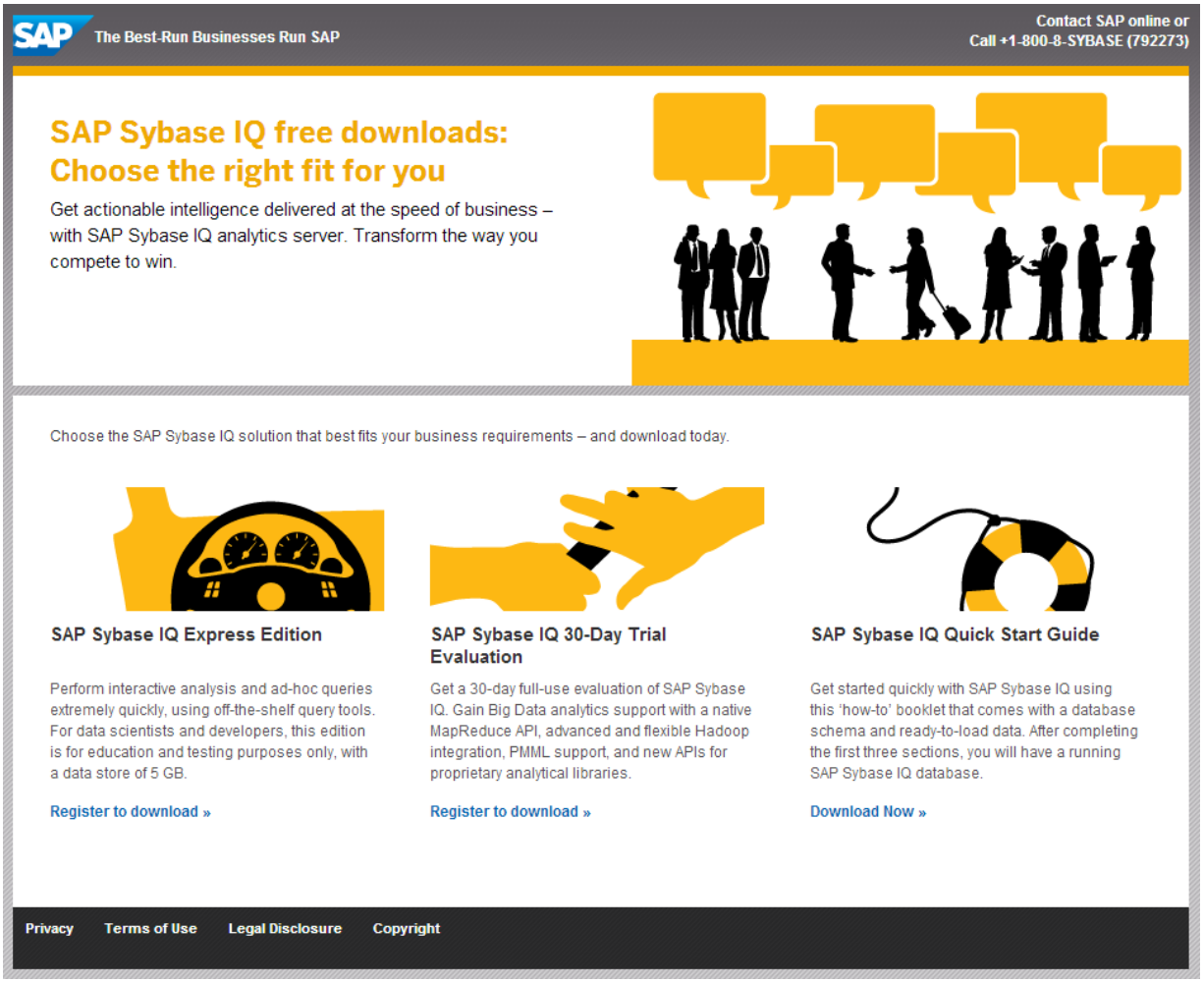
The evaluation edition will be useful to those who want to quickly try out SAP Sybase IQ to evaluate the full range of its capabilities without limits, and to perform competitive analysis.

The express edition will be of use to ISVs and developers, who want to experiment with SAP Sybase IQ, and keep it around for awhile. They do not need to apply stress with large amounts of data. This edition will be also useful for creating demos of smart applications.

2. Where to Get SAP Sybase IQ Evaluation Software

Supporting materials and a link to both the express edition and trial evaluation of SAP Sybase IQ are available at this website:

http://www.sap.com/campaign/ne/sybase/iq_16_free_trial_download/index.epx



3. Installation

Read the “Installation and Configuration Guide” (a link is provided on the software download page as noted above), and follow all the pre-installation steps.

Note: No license key is required for the Evaluation Version (30 day trial). The Express Edition includes a new IQ_XE SySAM license, which is installed as part of the Express Edition server package.

Unzip the installation file. You will see the file “setup.bin”, but before you execute this installation program, make sure you have read the installation guide and followed the pre-installation steps.

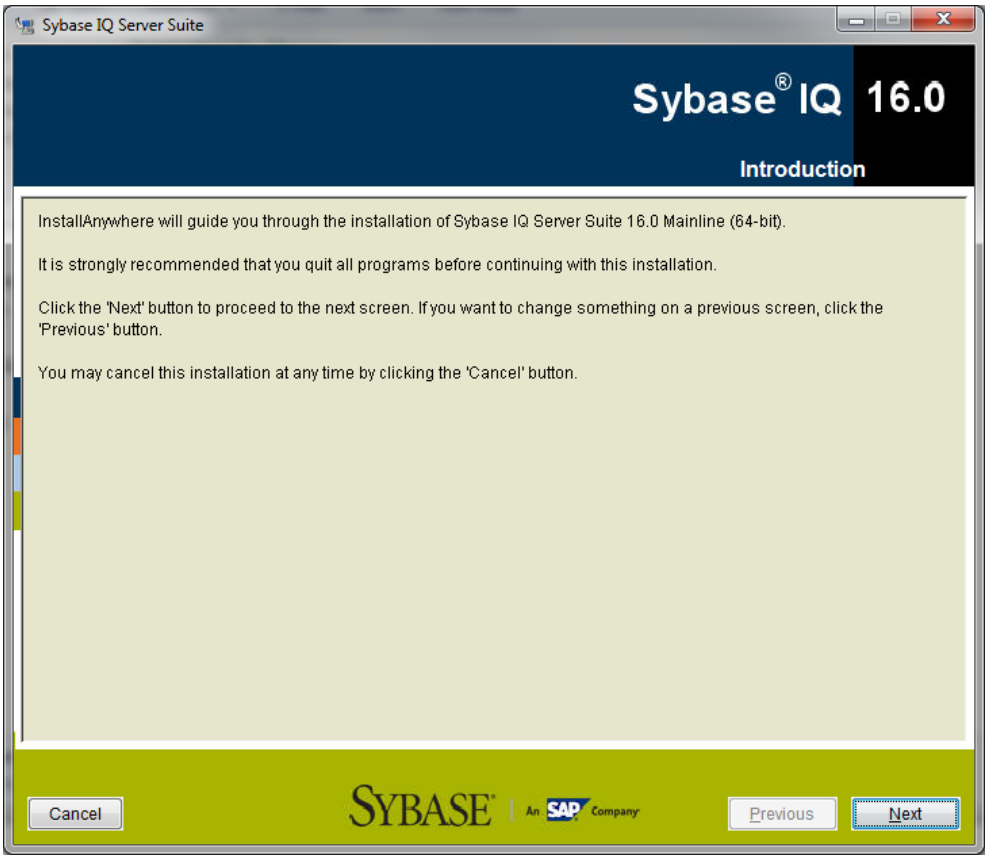
Note: Ensure 32-bit compatibility libraries are installed. If you start the SAP Sybase IQ installer in GUI mode without installing these libraries, the installer generates an exception and fails. RHEL 6.4, and earlier, requires 32-bit compatibility libraries to support Java-based applications in SAP Sybase IQ, including the SAP Sybase IQ installer. The following libraries are required to install SAP Sybase IQ on Red Hat Enterprise Linux 6:

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

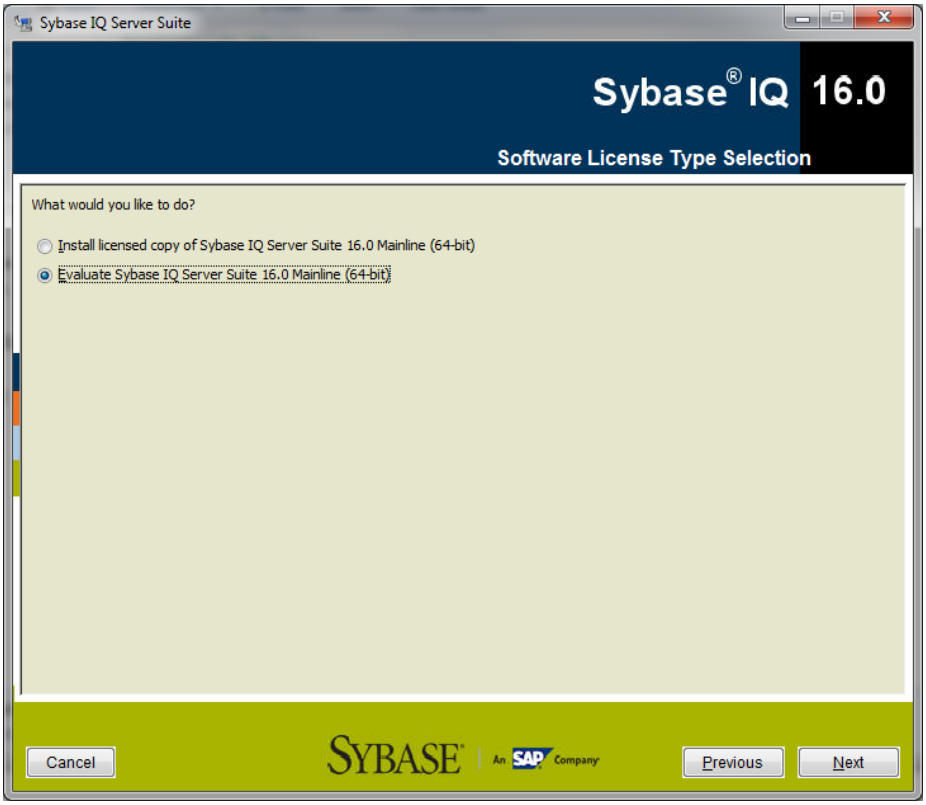
Other variants of 64 bit Linux will require 32-bit Wine installed to run the Windows Installer.

3.1 Running the Install Program

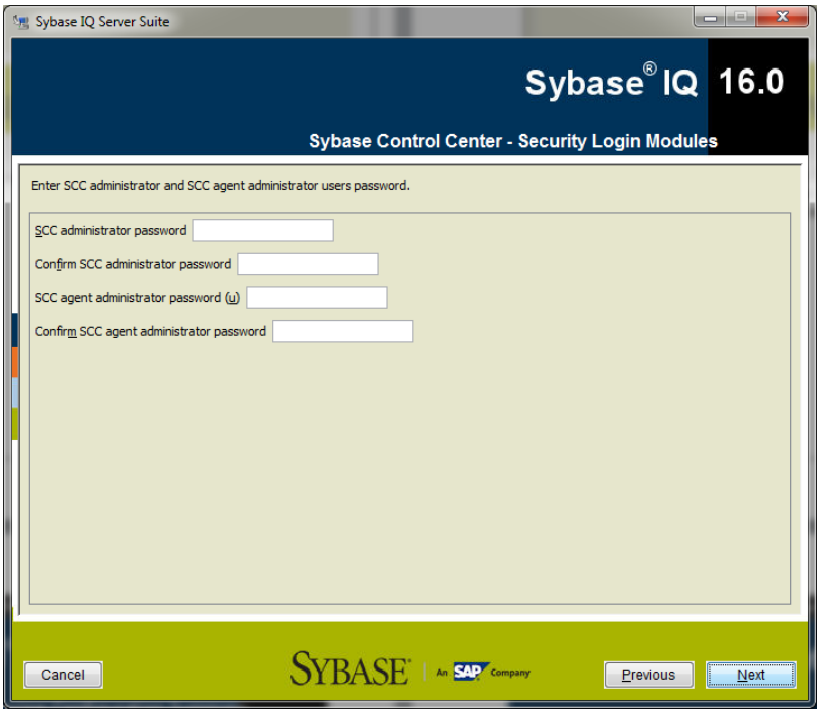
From a terminal window, change to the directory where you unzipped the installation image, and enter the command “./setup.bin”. The installer will launch, and you will see the following introduction screen:



Click on “Next” multiple times, accepting the defaults provided for installation path, and “Typical” install, until you reach the “Software License Type Selection” screen shown below:



Use the default, “Evaluate SAP Sybase IQ Server Suite 16.0 (64-bit)”. Click on "Next" to select a geographical location and accept the license agreement. Accept the defaults for a “Typical” installation by clicking on the “Install” button. When complete, the Configuration for Sybase Control Center will begin. Click “Next” multiple times, and accept the default ports. Then, you will see the security login modules screen:



Enter passwords for the SCC admin and SCC agent admin, ensuring to *remember the passwords*, which will be required to use SCC later. Then, you will be prompted to choose whether or not to run Sybase Control Center as a Windows service. Choosing yes allows Windows to automatically start and restart SCC, which is recommended. Continue, reviewing the information screen, and starting the Sybase Control Center Server (which will be used in this demo later).

When SAP Sybase IQ 16.0 installs successfully, you will see the following display:

Click on “Done”.

3.2 Validating the Install

The next step is to validate the install. SAP Sybase IQ comes with a demonstration database. If you can start up the demonstration database and connect to it with a client application, then you know that your installation has been successful.

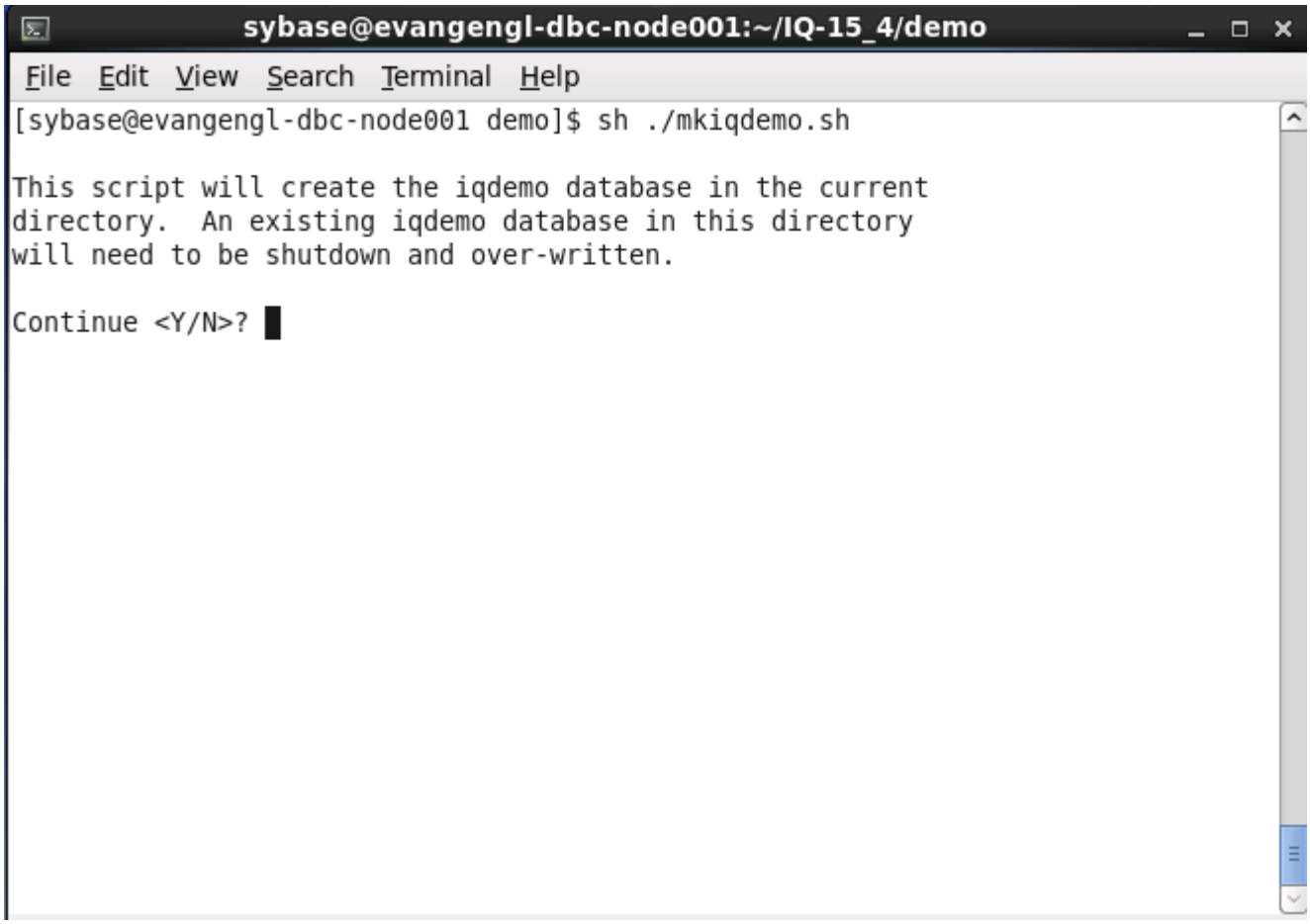
First, add the following three lines that set required environment variables to the .bashrc file in your home directory (/opt/sybase is the default root directory for the SAP Sybase IQ install make sure to use the directory to which you installed SAP Sybase IQ), and re-invoke the .bashrc script:

```
export SYBASE=/opt/sybase
. $SYBASE/SYBASE.sh
. $SYBASE/IQ-16_0/IQ-16_0.sh
```

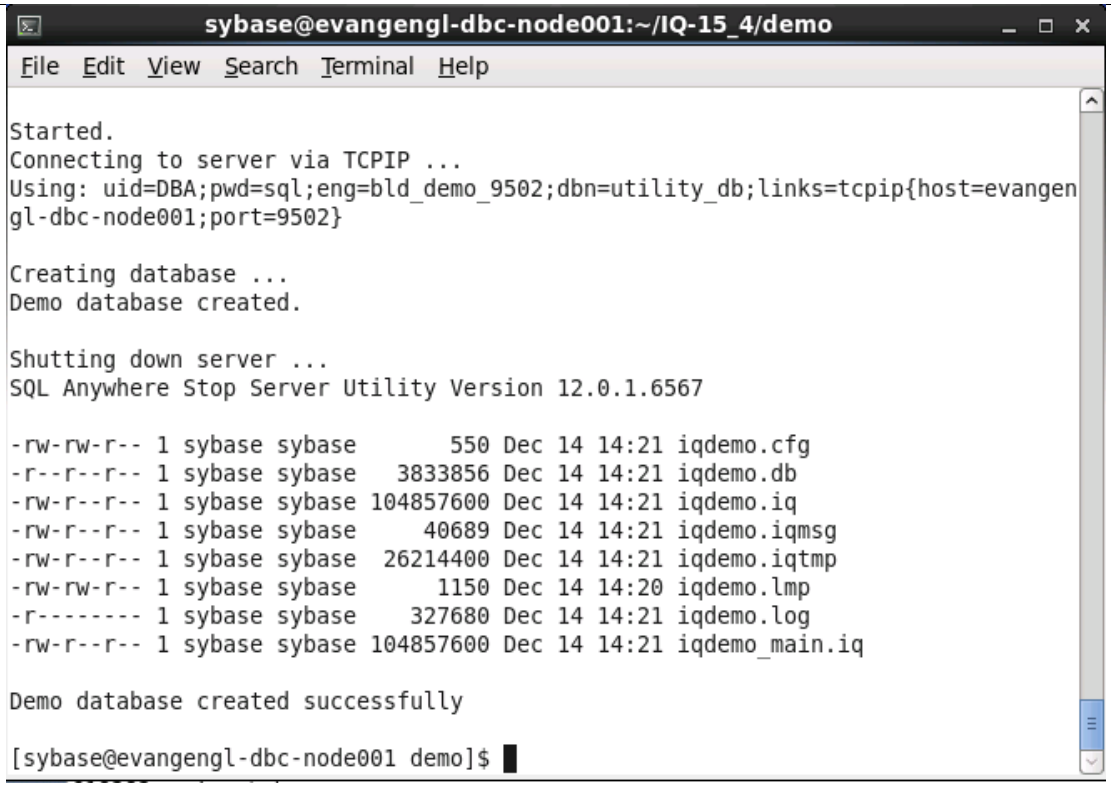
To start up the demonstration database, execute the following commands from a terminal window:

```
cd $IQDIR16/demo
sh ./mkiqdemo.sh
```

The first time you do this, IQ needs to create the demo database. You will see this:



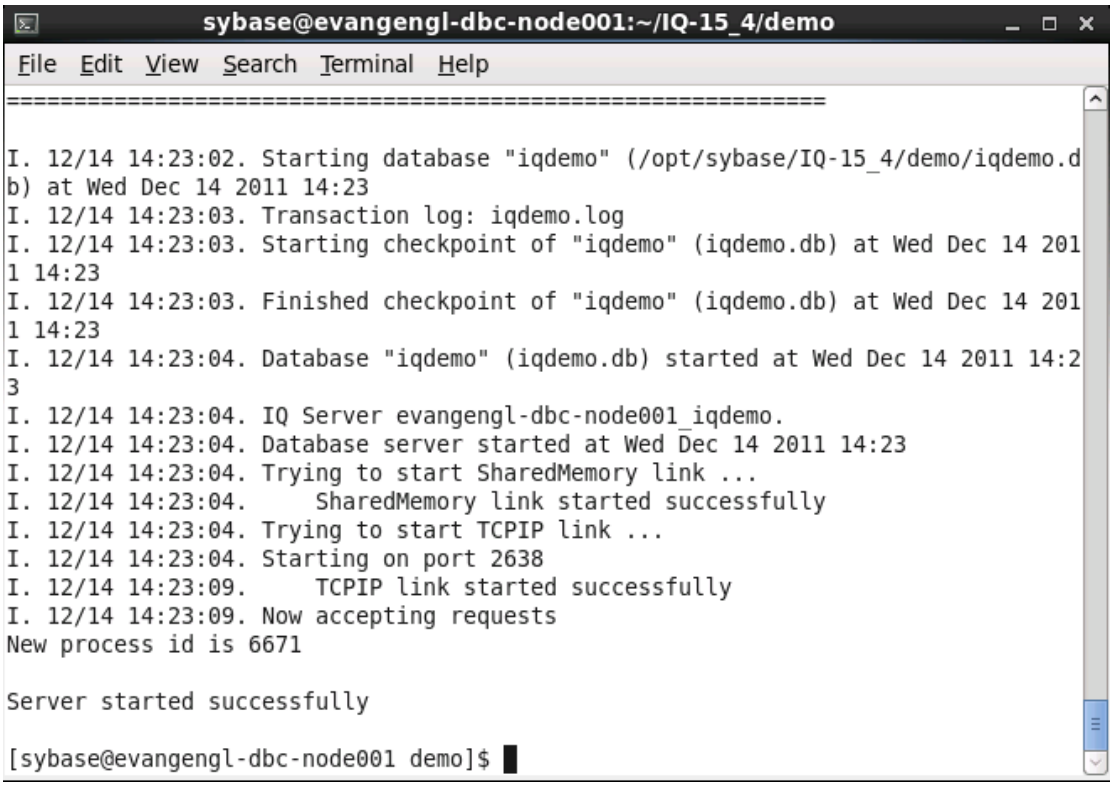
Enter "Y", and SAP Sybase IQ will create the demo database. If the database is created successfully, you will see the following:



The database was created, but the IQ server wasn't started to connect to it. To start the IQ server and connect to the demo database, enter the following command:

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

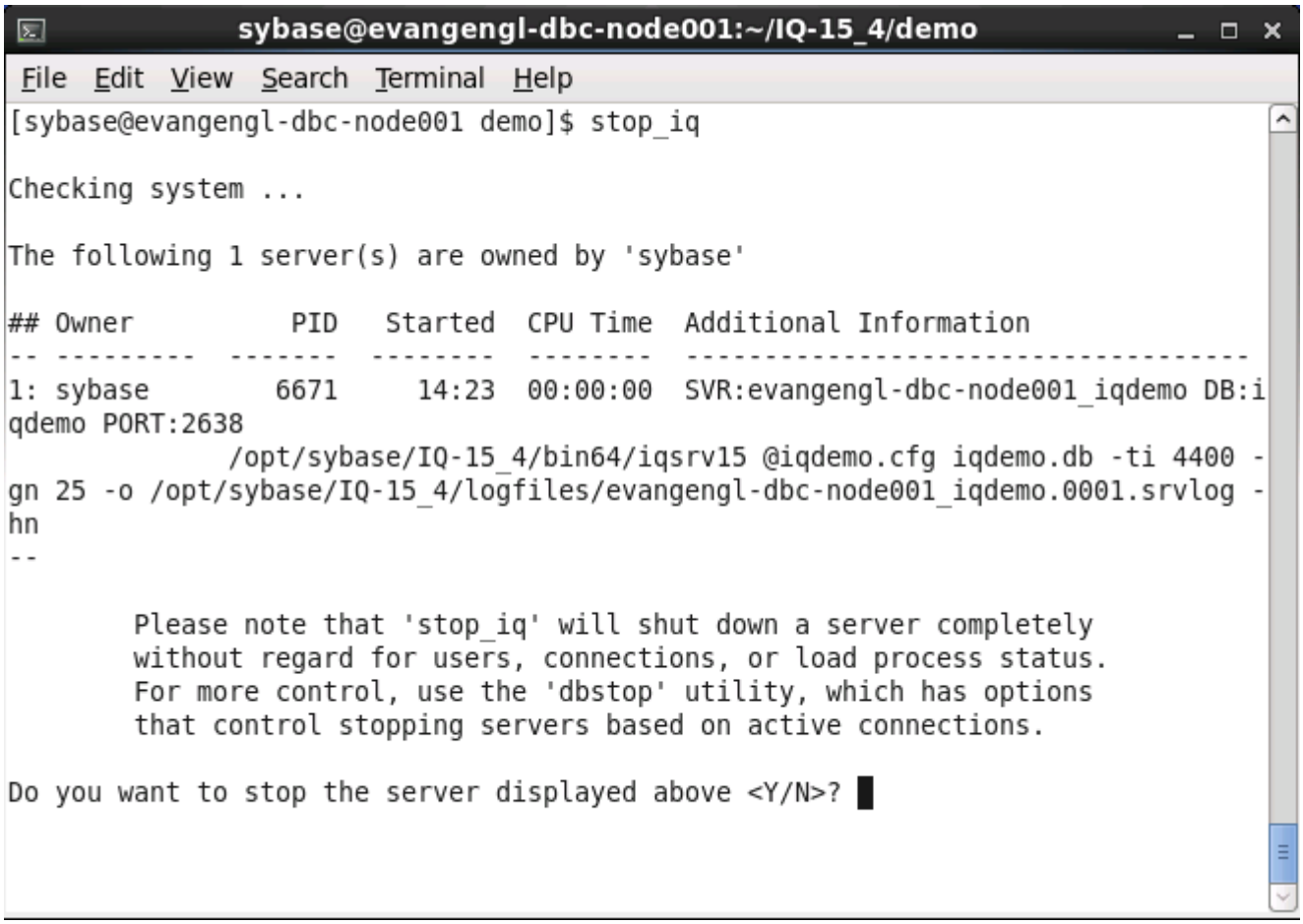
If the demo database started up correctly, you will see the following in your terminal window (the IQ server listens by default on port 2638):



At any time, you can see which IQ databases are running on your machine with the following command:

```
stop_iq
```

You will see the following:



Type "N" to leave the IQ server up and running

3.3 Connecting to the SAP Sybase IQ Demo Database

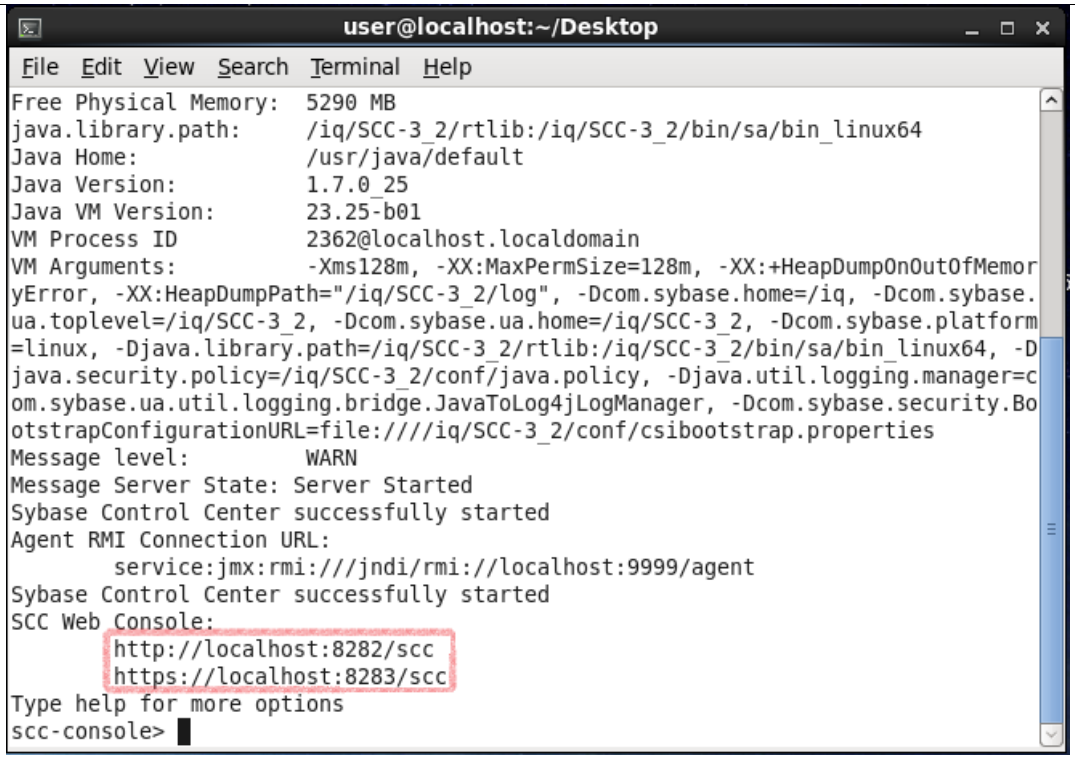
You have started up the SAP Sybase IQ server and demo database, but you will want to connect to it with a client application in order to complete the validation of the install. A client application can connect to the SAP Sybase IQ server using ODBC, JDBC, or Sybase's native interface called "Open Client". There are also other database drivers for various programming environments: OLEDB, ADO.NET, Perl, PHP, Python, and Ruby.

Sybase Control Center is a web-based tool for monitoring and managing servers. It can be used to connect to a database and perform administrative tasks.

Before running SCC, ensure that write permissions are granted to the $SYBASE folder and subfolders. To start SCC, enter the following in a terminal window:

```
$SYBASE/SCC-3_2/bin/scc.sh
```

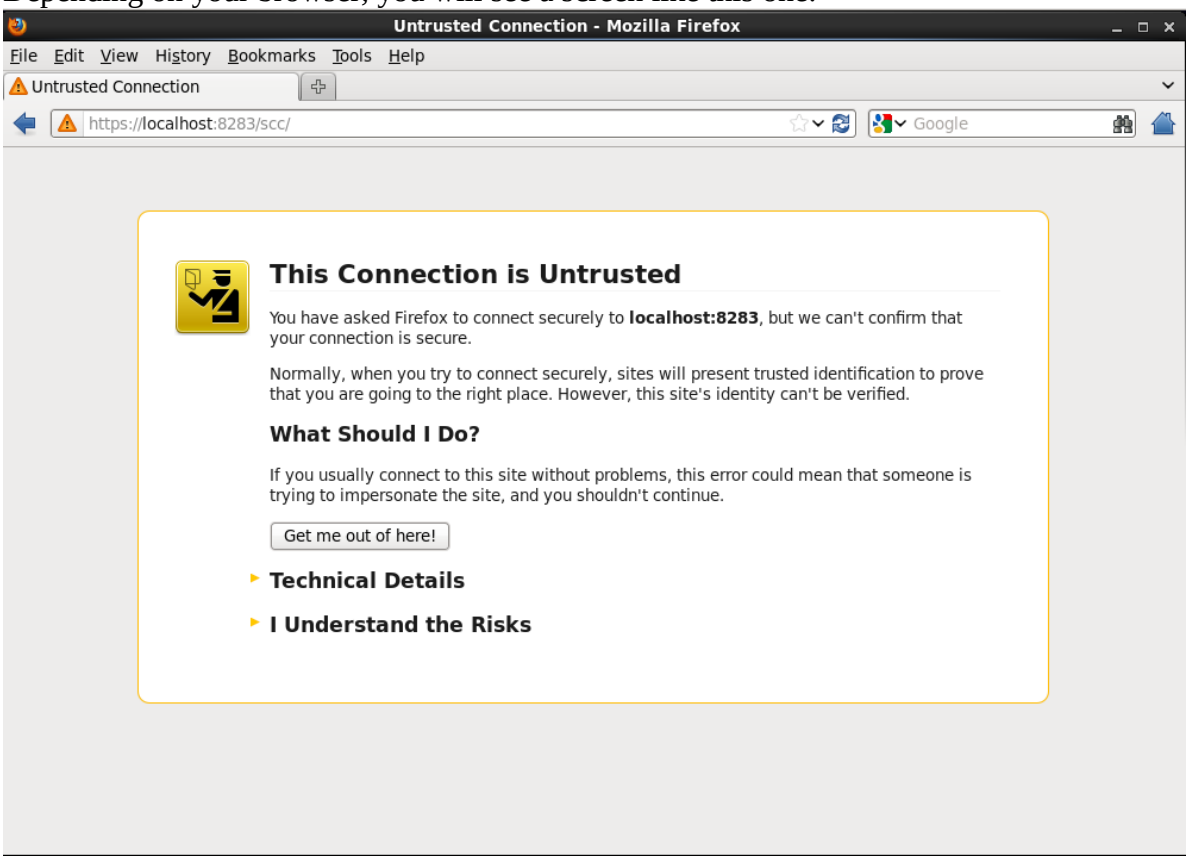
Once started correctly, you should see the following screen:



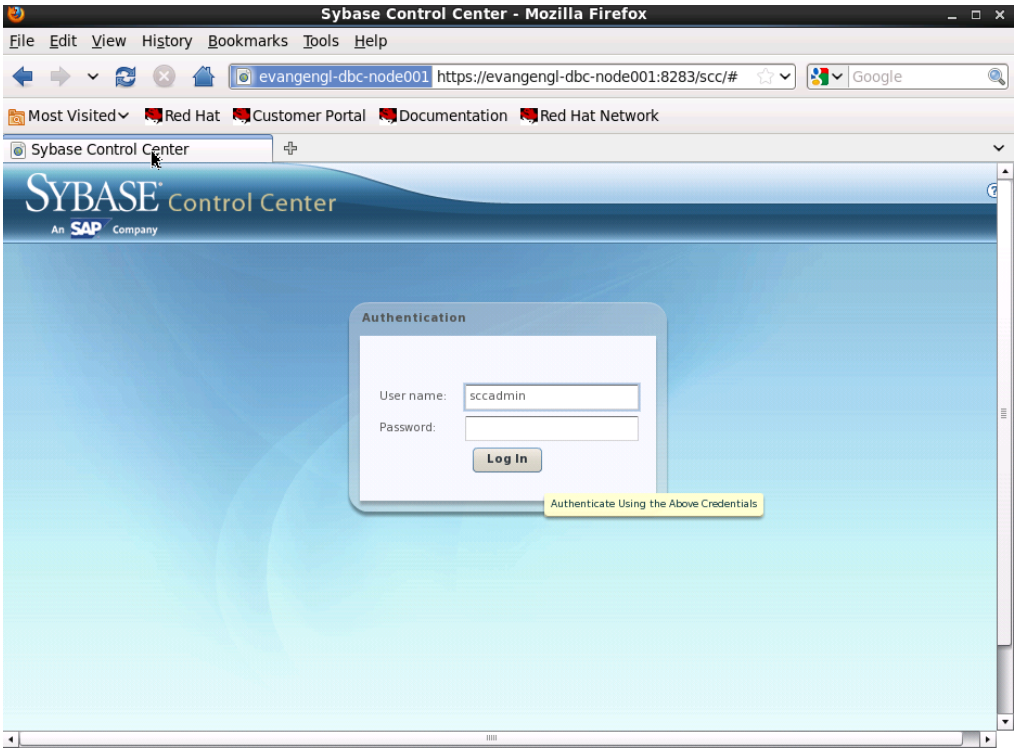
Either URL specified below SCC Web Console (circled in red) can be used to access the Sybase Control Center. Open up a web browser, and enter the following URL, from above:

`https://<scc_server_hostname>:8283/scc`

There is no security certificate for the HTTPS secure connection, but choose to proceed anyway. Depending on your browser, you will see a screen like this one:

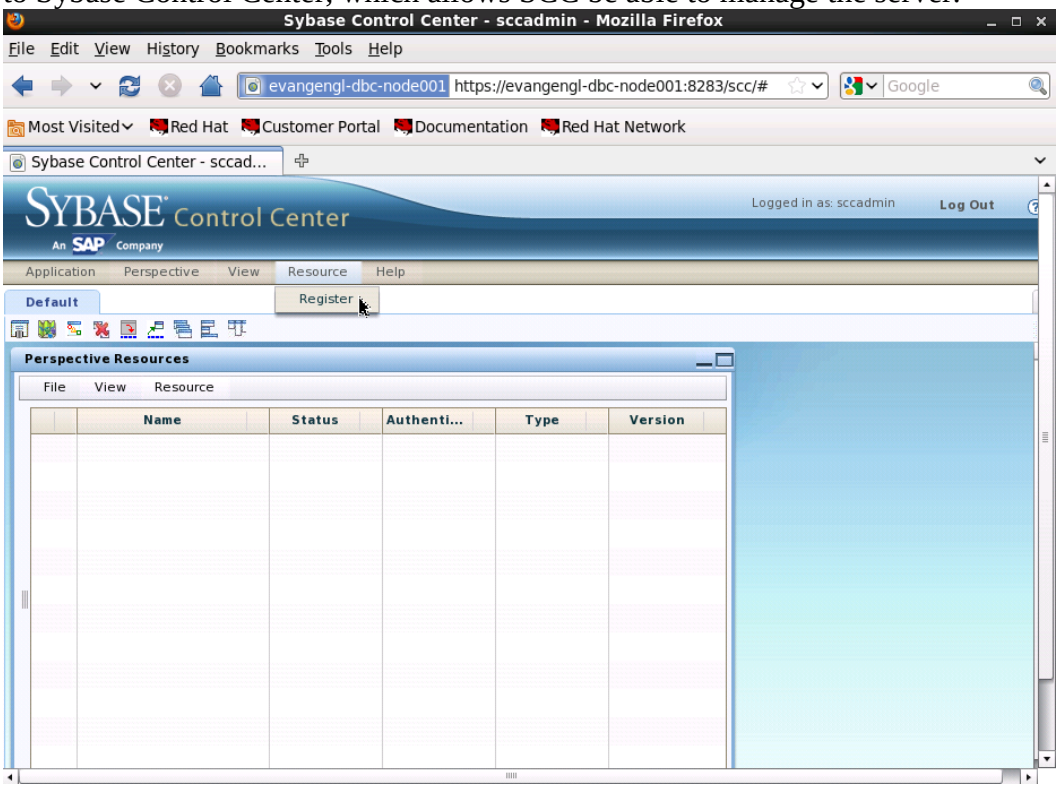


Continue. You will then see the login screen:

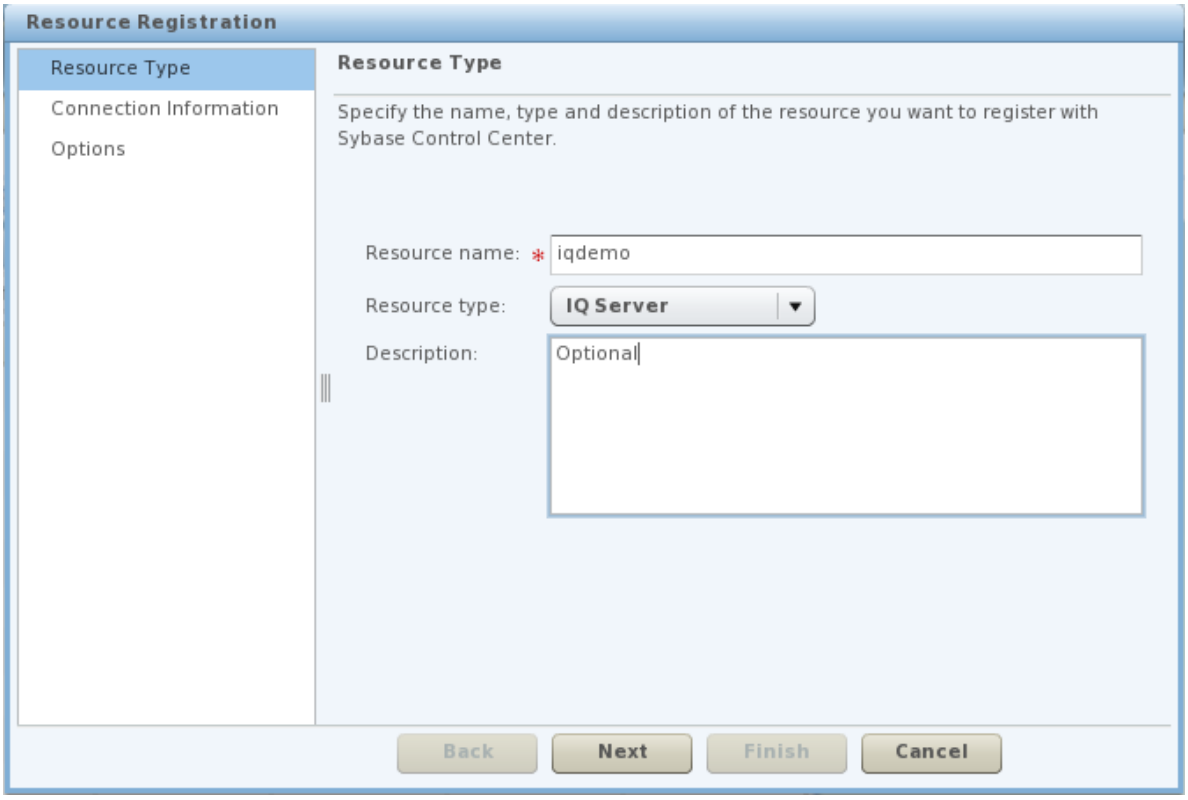


Enter “sccadmin” for the user, with the password created during installation and click on “Log In”.

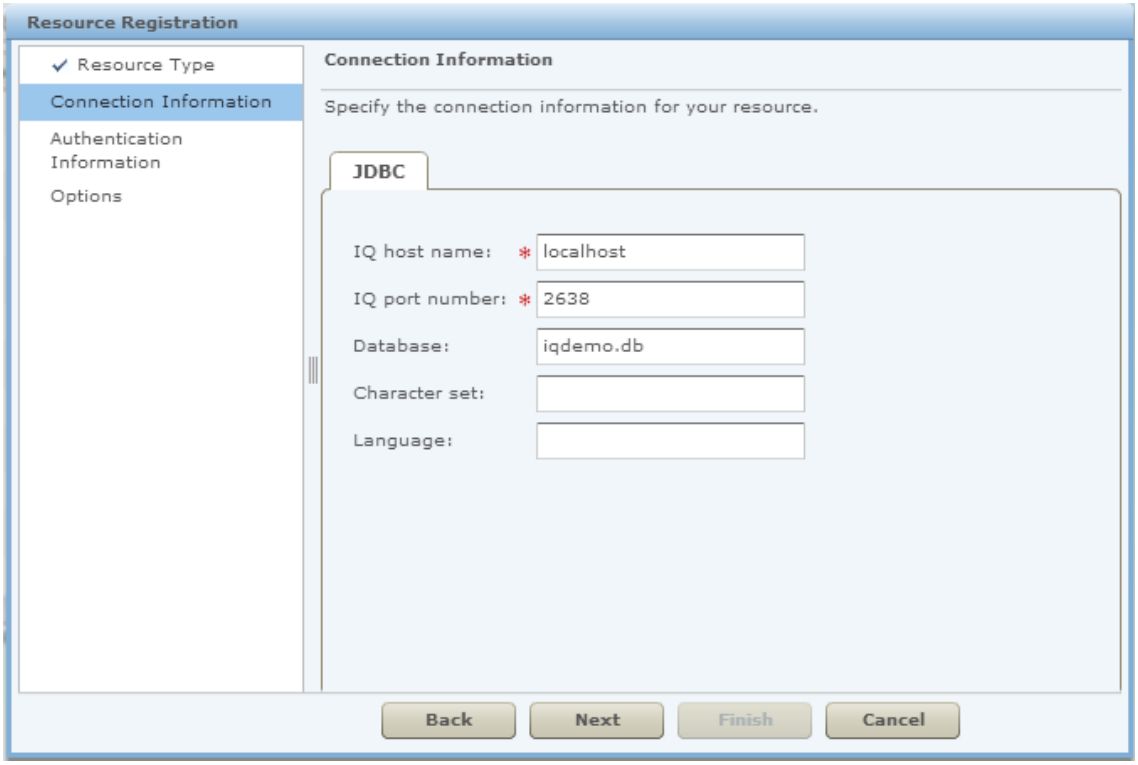
Once logged in, register the IQ resource by clicking resource in the top navigation bar and then clicking register in the drop down menu. Registering the server provides its identity and connection information to Sybase Control Center, which allows SCC be able to manage the server.



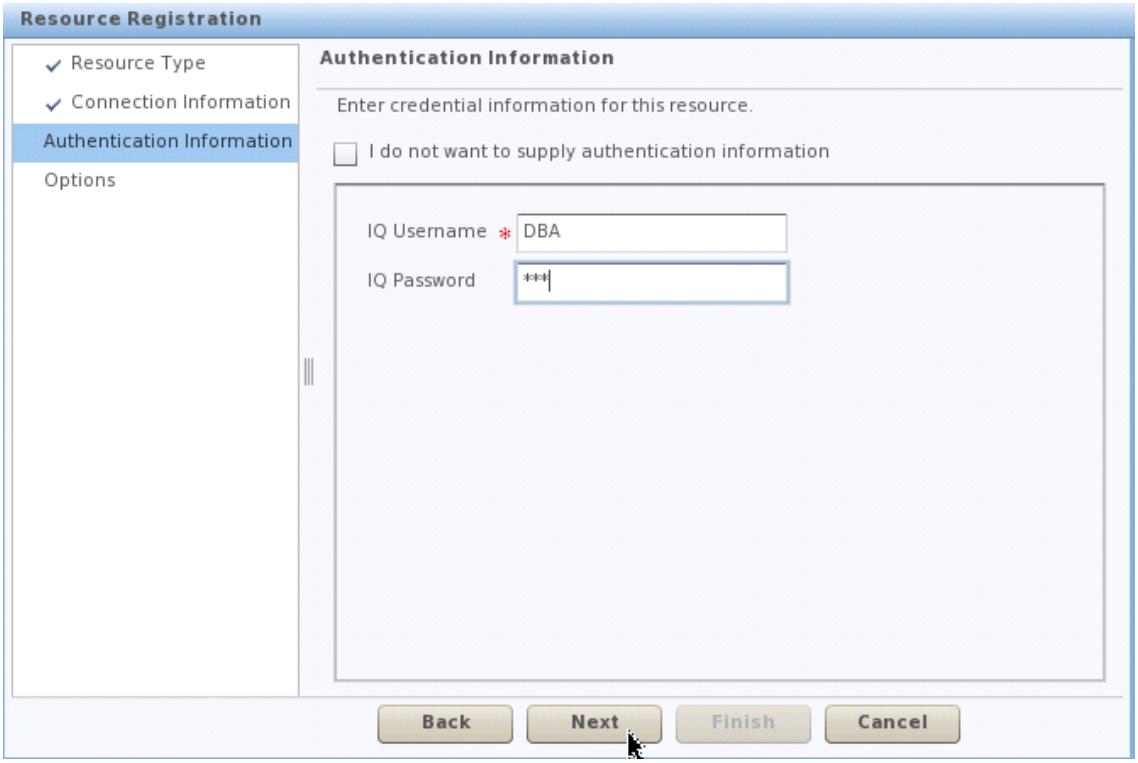
Name your resource, whatever you choose, setting the Resource Type to “IQ Server”.



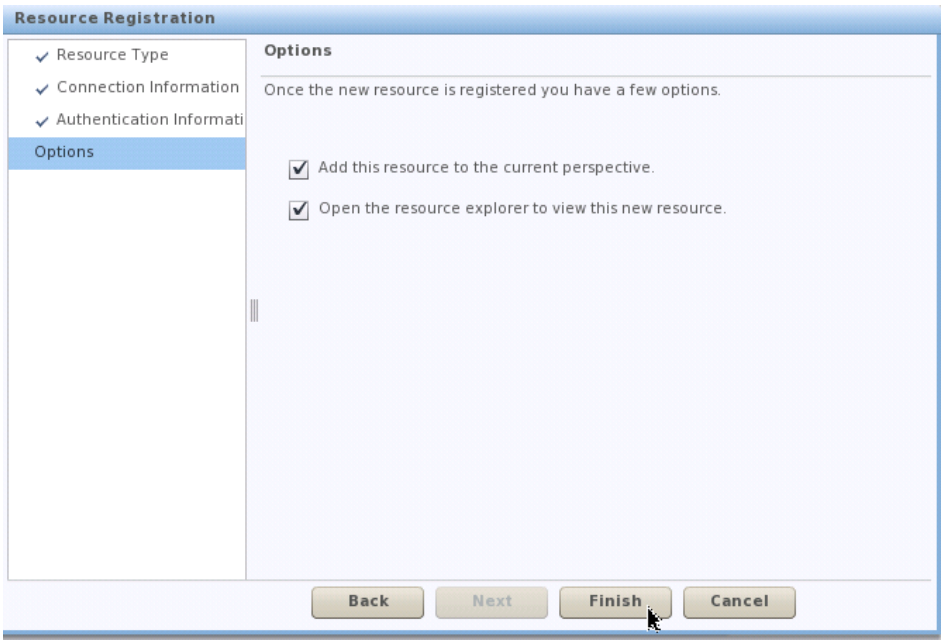
Click next. Enter connection information, 2638 is a default port for IQ and the database name is optional.



Enter DBA and “sql” for the password and click next.

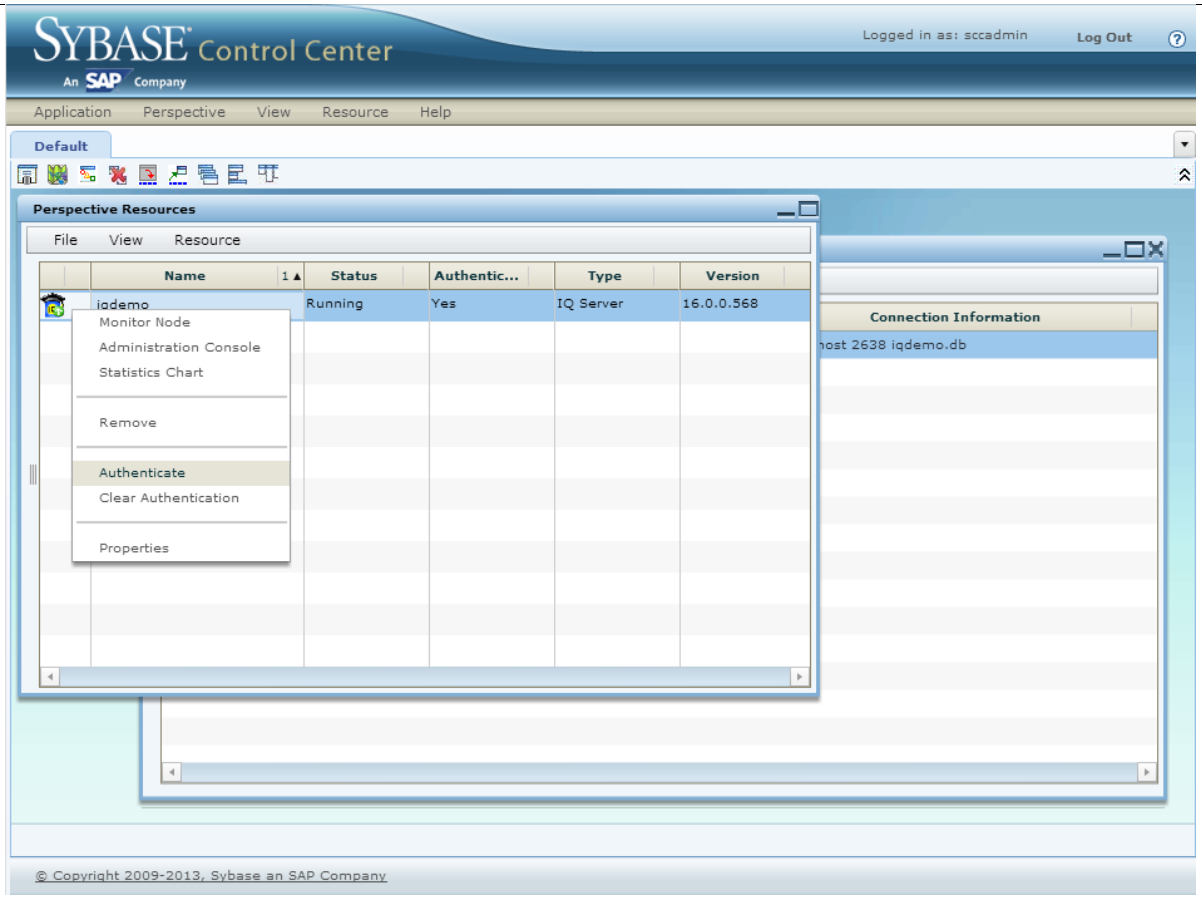


Check both boxes and click next again.

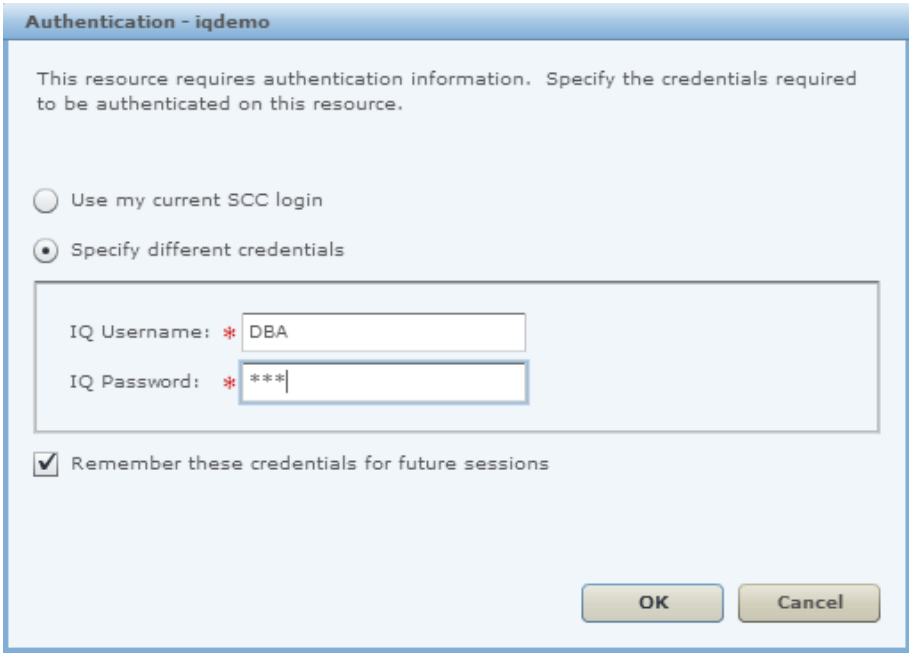


Click Finish.

Now the resource is added to the perspective. In Perspectives Resources, move your mouse over the server name textbox (in this example, iqdemo). A drop-down arrow appears, on the right. Click the drop-down beside the server name and choose “Authenticate”.

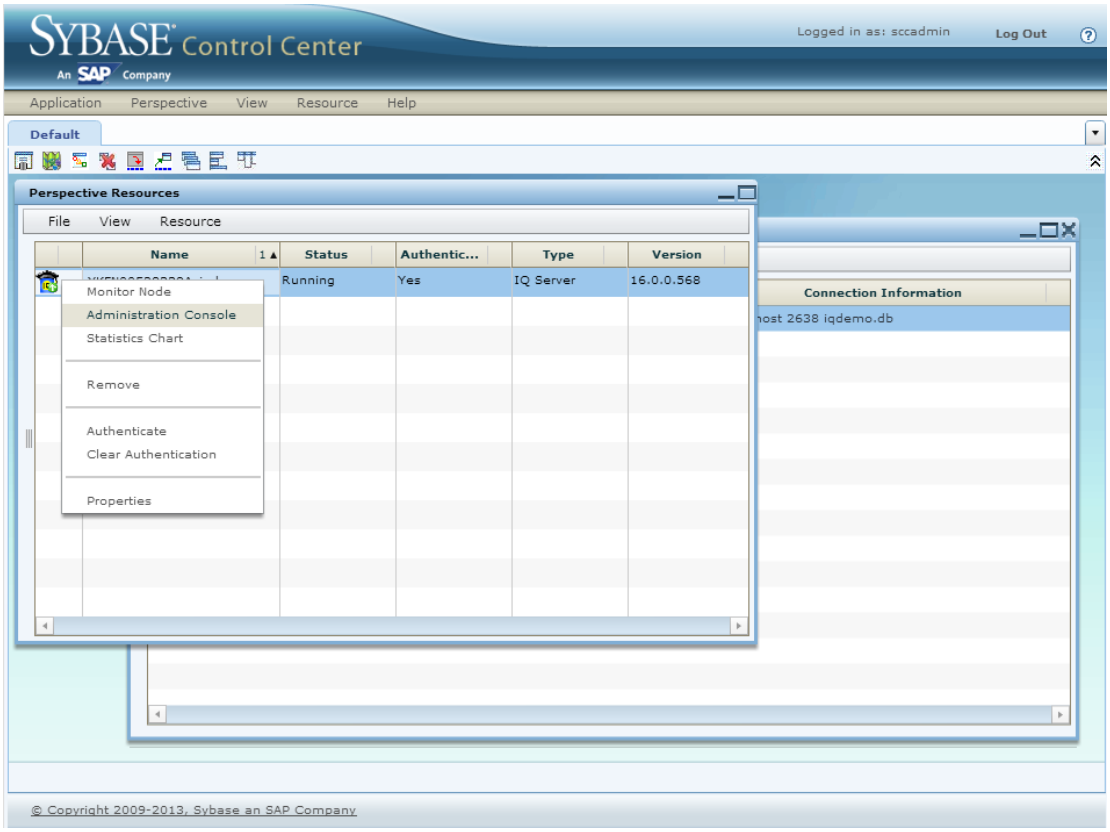


Authentication window opens. Enter information from resource set up.

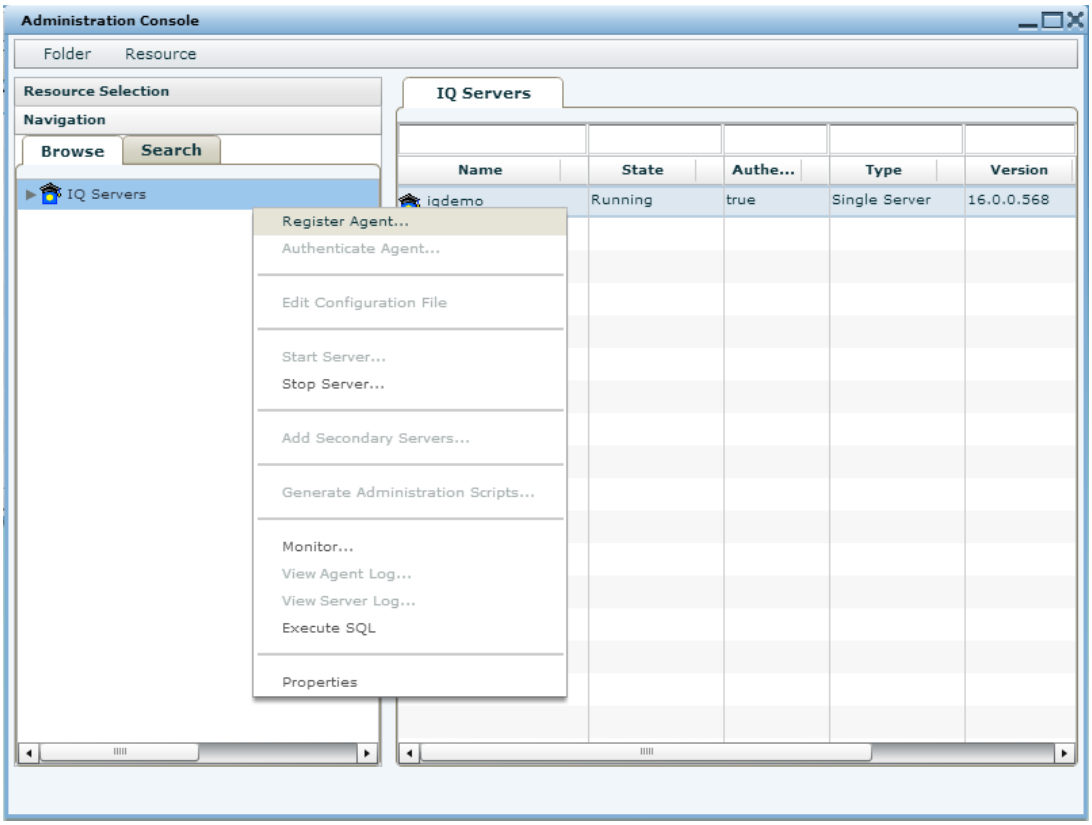


Once authenticated, the Sybase Control Center agent must be registered and authenticated. The SCC agent was installed with the installer and allows management tasks to be performed.

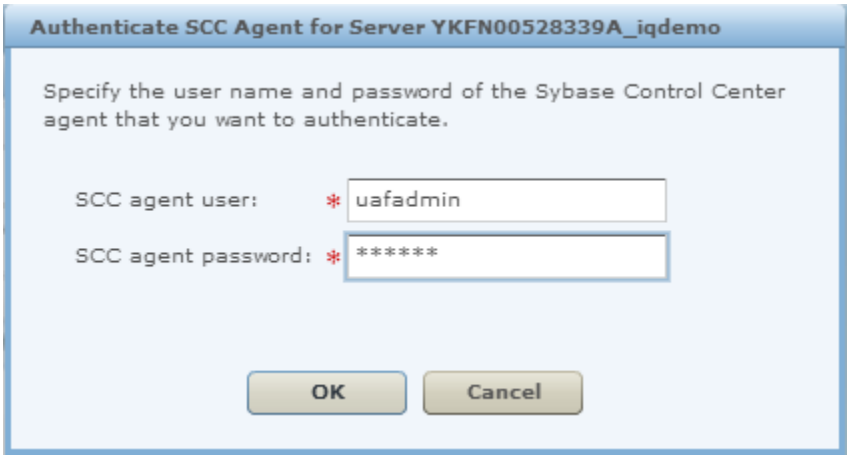
On the Perspective Resources window, click the drop-down next to the server name and choose "Administration Console".



On the Administration Console which opens, click "IQ Servers" under Browse. The server will appear on the list. Then, on the drop-down beside the server name, click "Register Agent…"

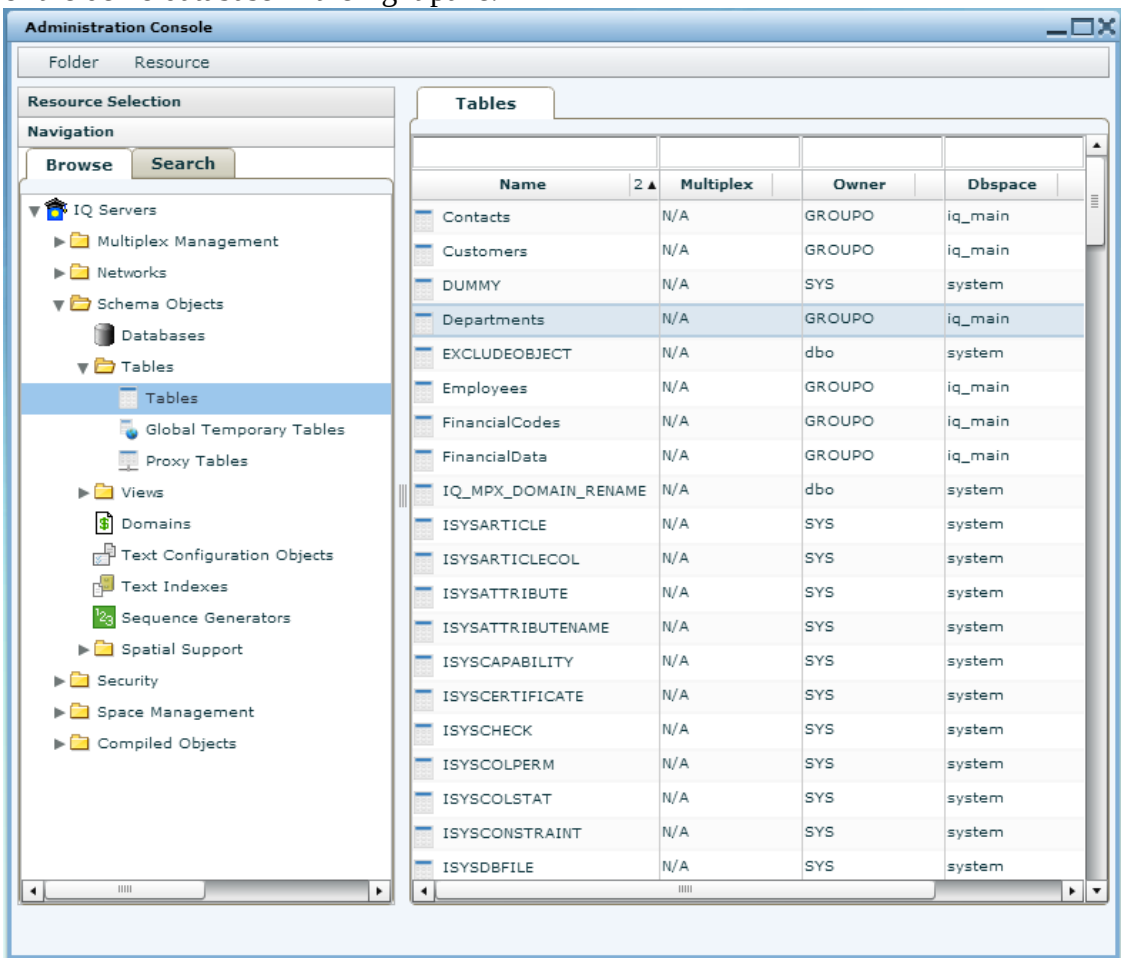


In the pop-up window, leave the defaults (<localhost> is the SCC agent host and 9999 is the default agent port) and click “OK”. Then, click the drop-down arrow beside the server name again and click “Authenticate Agent…”. Leave the agent user as “uafadmin” and provide the second password entered during installation. Click “OK”.

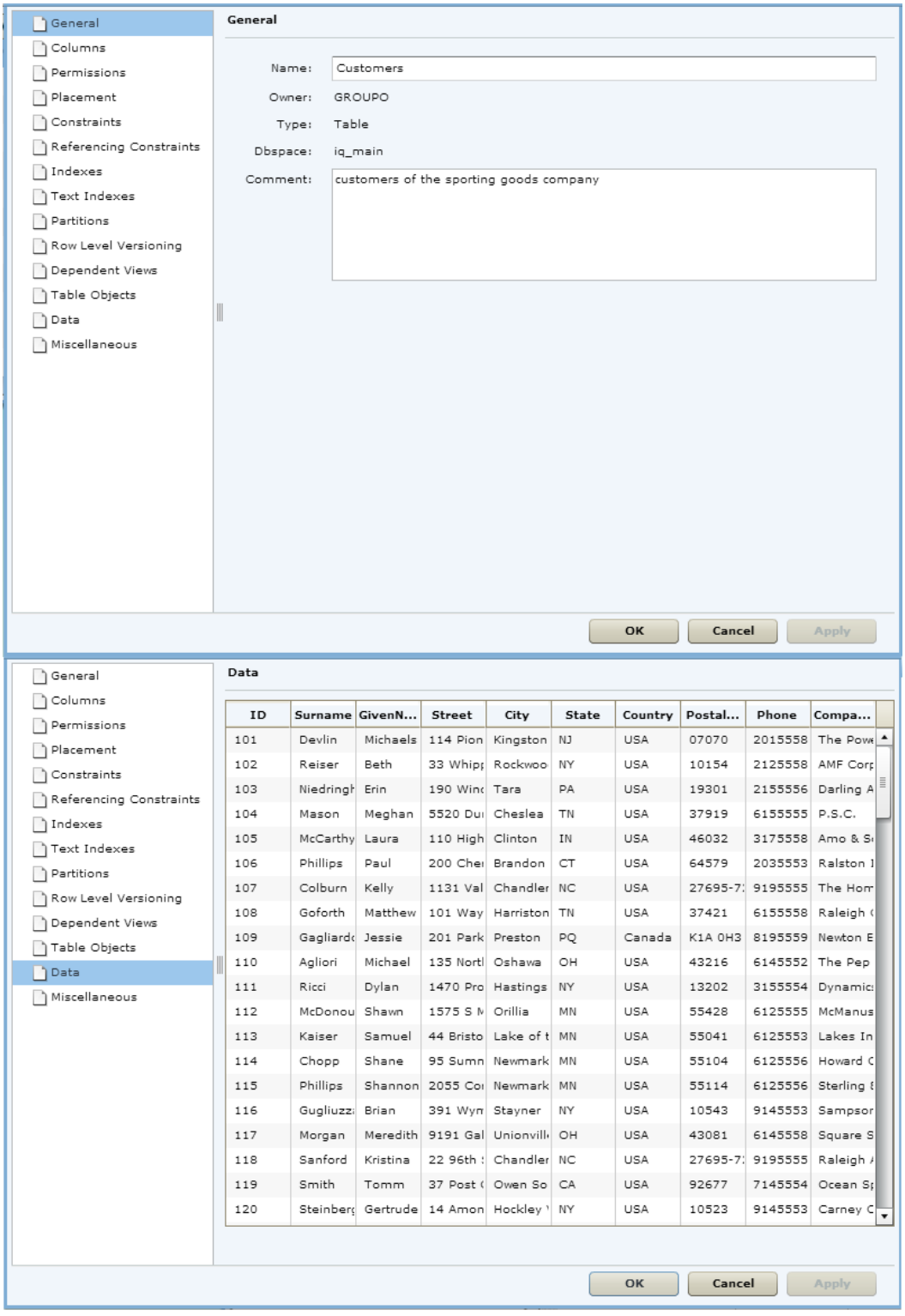


The agent is now registered and authenticated and can perform administrative tasks for the server.

Now click the arrow beside “IQ Servers”, under browse and then, expand the arrow beside “Schema Objects”, then “Tables”. Click on “Tables” under the Tables folder. You will see the tables that are part of the demo database in the right pane.



Click on the drop-down arrow beside “Customers” and click “Properties”. Then, you will see general properties of the table. Each item in the left pane provides different data on the table. Click on the “Data” item in the left pane. Now, all the customer data in the table is in the right pane.

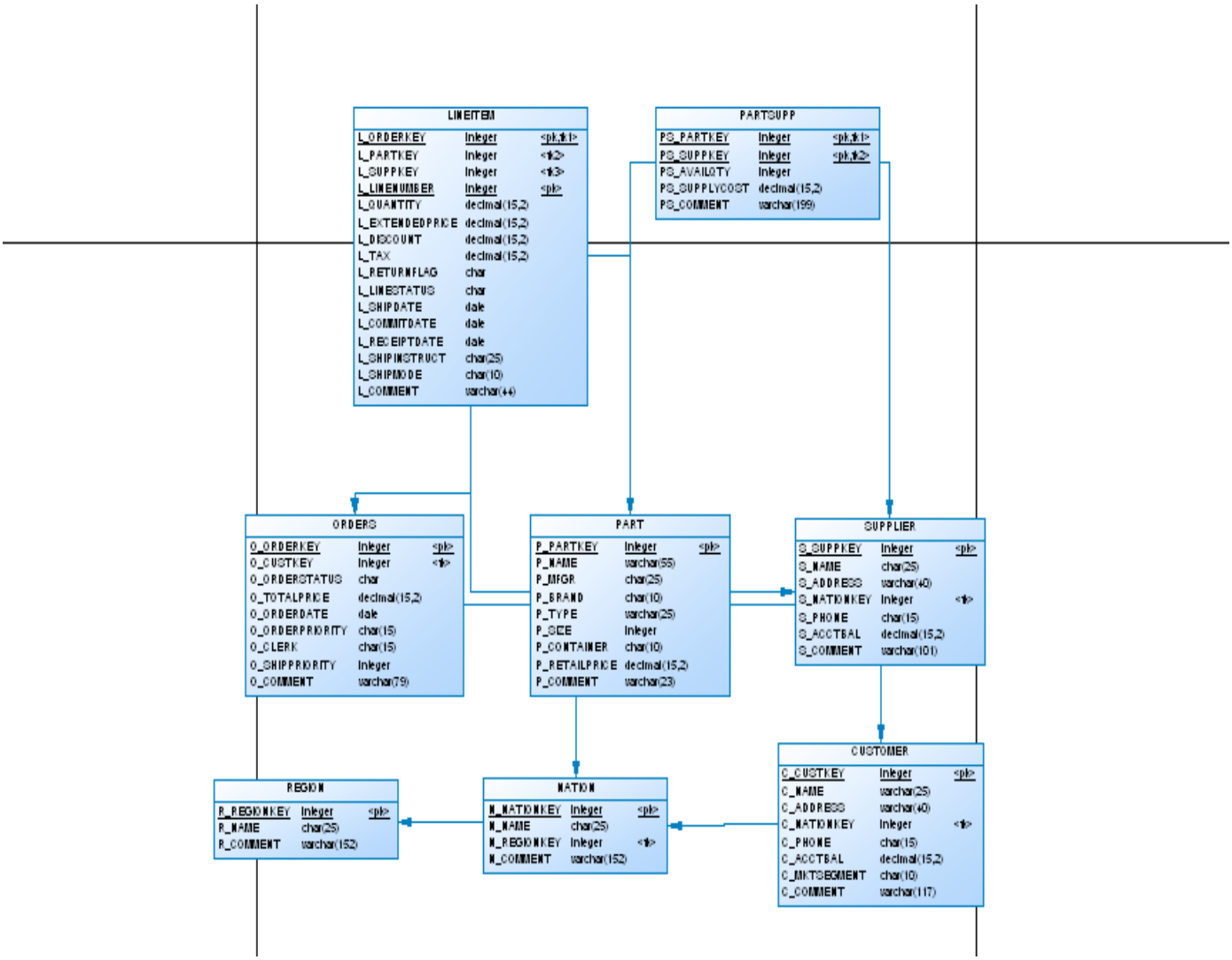


Now that you can connect to the demo database, you know that you have a solid installation of SAP Sybase IQ.

4. The TPC-H Schema

TPC-H is a decision support benchmark created by the Transaction Processing Performance Council. It consists of a schema, the data to populate that schema, and a set of business oriented queries. The schema models an industry database which manages, sells and distributes products worldwide. The tables in the schema consist of orders, line items, parts, suppliers, customers, and countries. The queries simulate various classes of business analysis: pricing, supply and demand, profit and revenue, and shipping

Here is a picture of the TPC-H schema as depicted in Sybase's PowerDesigner modeling tool:

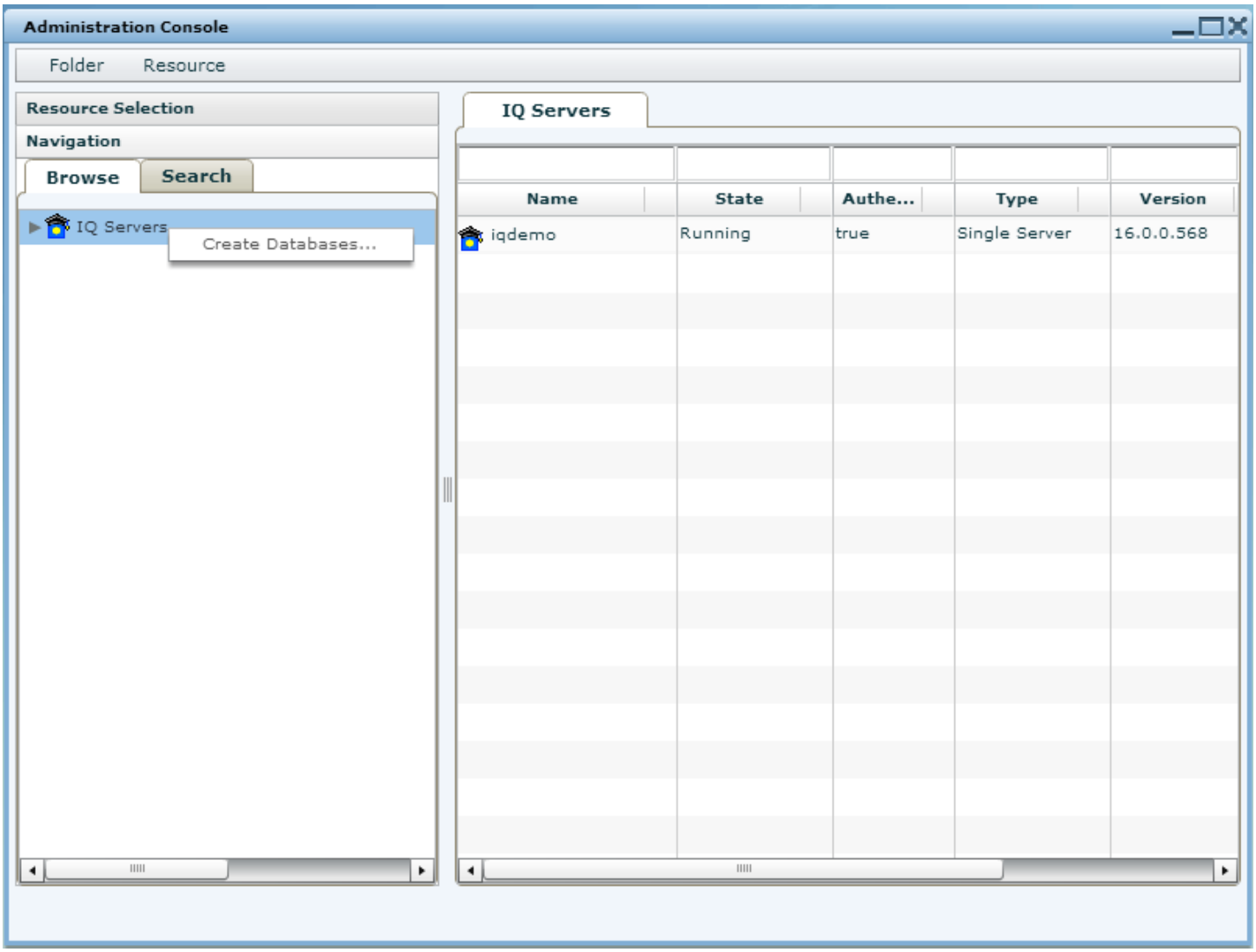


The next task you are going to perform is to create a database which will be loaded with this schema.

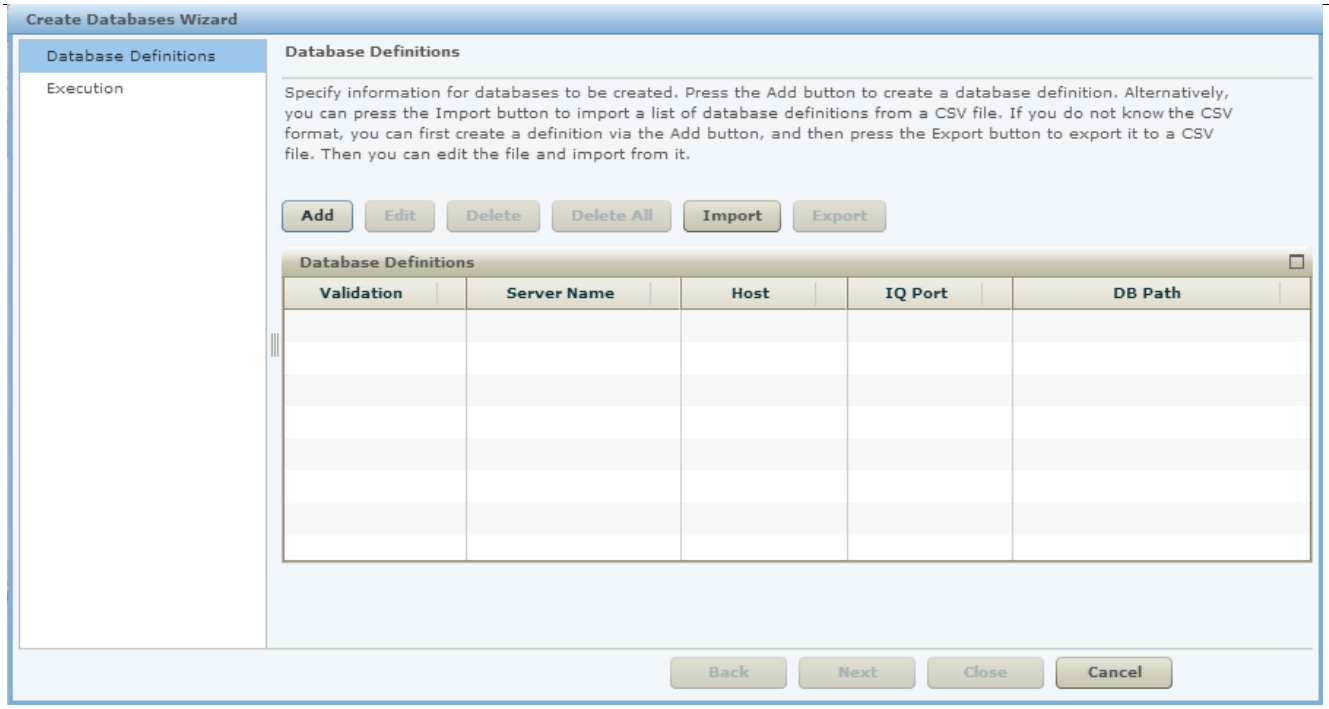
5. Creating the Database

In order to create a database from Sybase Control Center, you need to have a running SAP Sybase IQ server and an authenticated agent. You already have the demo database and agent up and running, so you can use that. (Another way is to start up the *utility database*. The utility database is a database that never holds data. The database server uses it at times when it needs a database to connect to, but no database exists.)

From the Administration Console in SCC (if not open, go to View -> Open -> Administration Console), click on "IQ Servers". Then, click the drop-down arrow and click "Create Databases…"



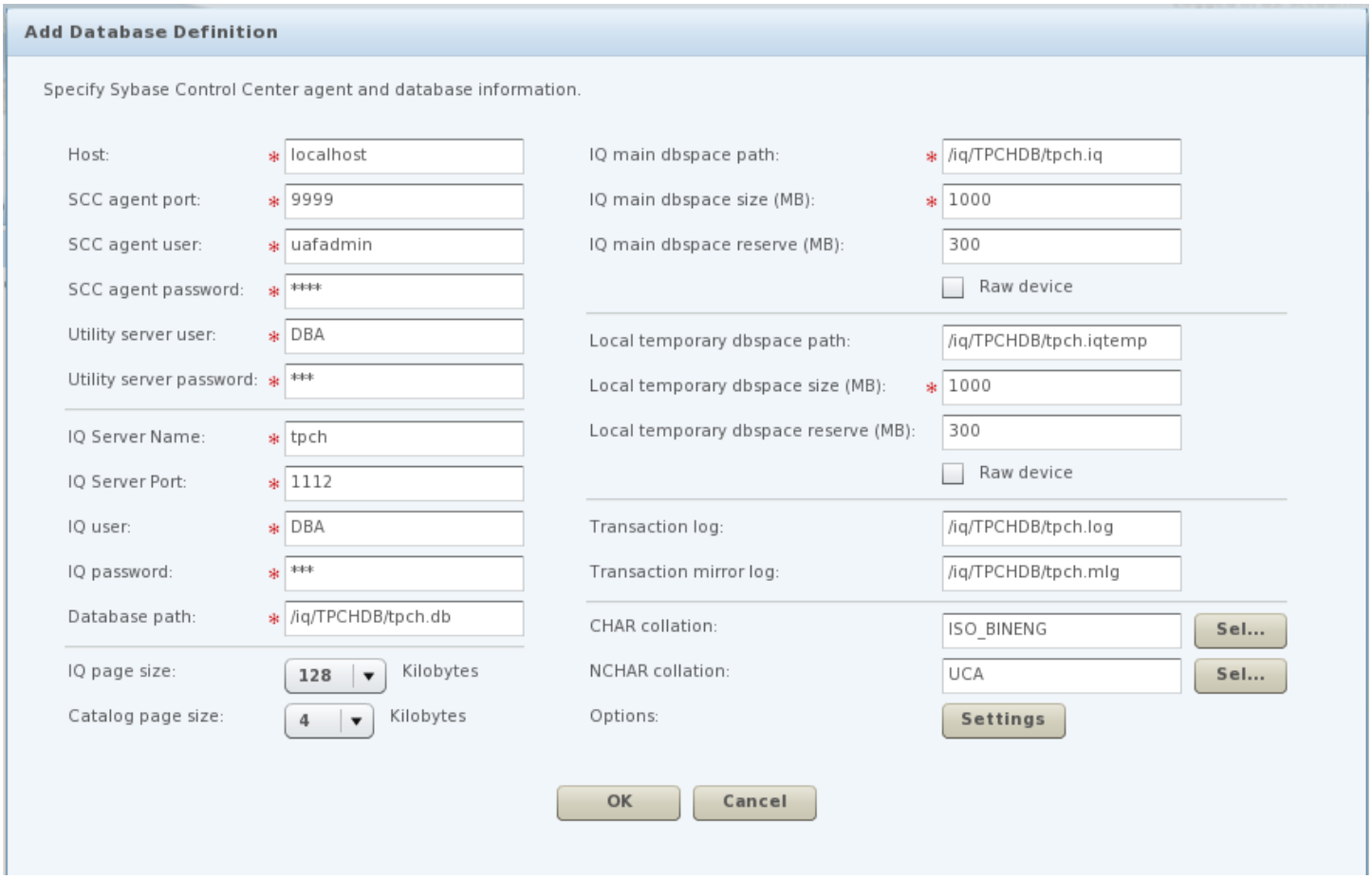
The first dialog that displays is an introduction to the wizard:



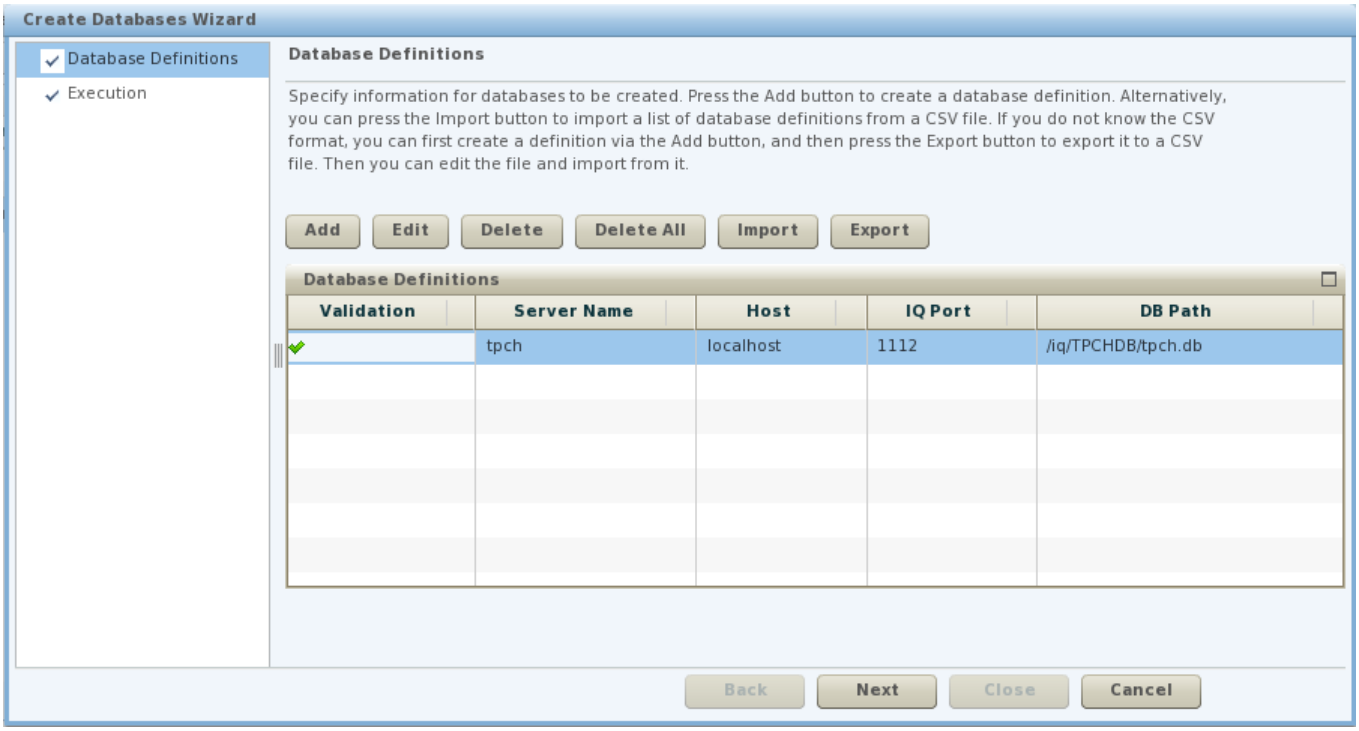
Click “Add”. Then, you will be asked to specify agent and database information. Fill out the required information as specified below and in the diagram.

For “host” specify the machine name or localhost (if both SCC and the server are on the current machine). Leave the default port and logins but enter the password from the installation for SCC agent password.

Choose the name, port and login for the new database and enter it for IQ Server Name, IQ Server Port, IQ user and IQ password. Use the absolute path of where you want to save the database for Database path and IQ main dbspace path (the folder and files will be created, as necessary). If you check raw device, the files will be placed in raw storage. All other defaults can be kept.

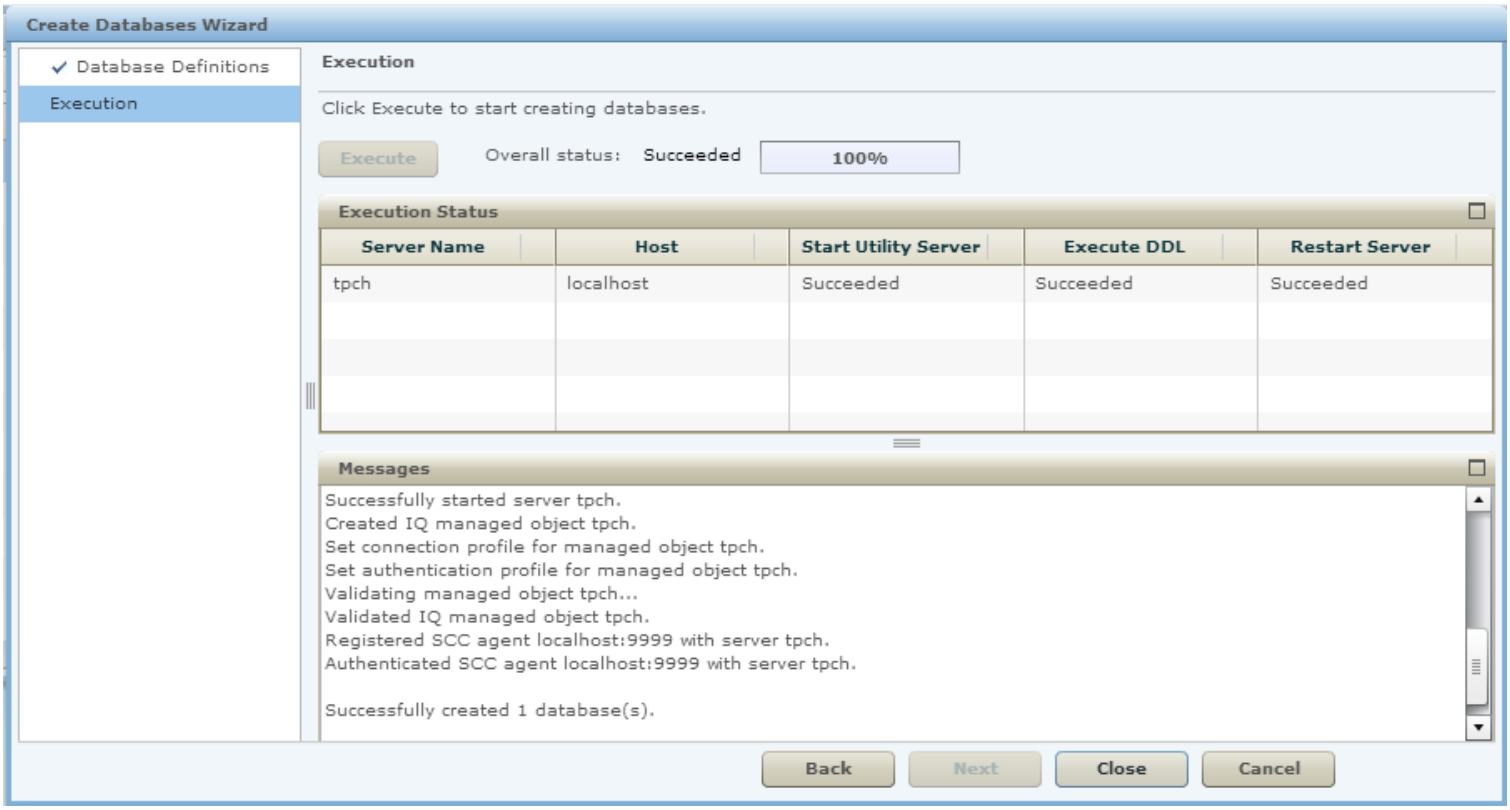


Click “OK”. If specified information is entered correctly, the server name will be added and there will be a green check mark under “Validation”.

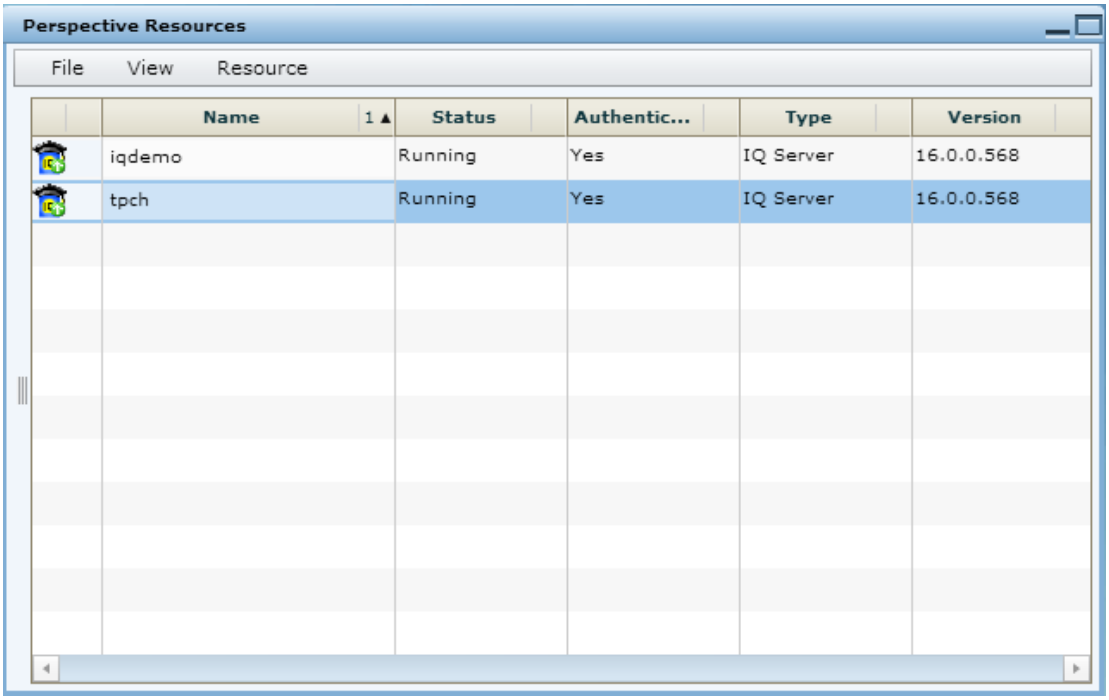


Click “Next”. Then, click “Execute” to create database. The progress bar will fill and log messages will appear.

When complete, you will see the following screen:



Click “Close”. Now, in the Perspective Resources, the new server will appear.



Note: Sybase Control Center for SAP Sybase IQ supports a maximum of one database per server. Due to this, adding the “tpch” database also added the “tpch” server.

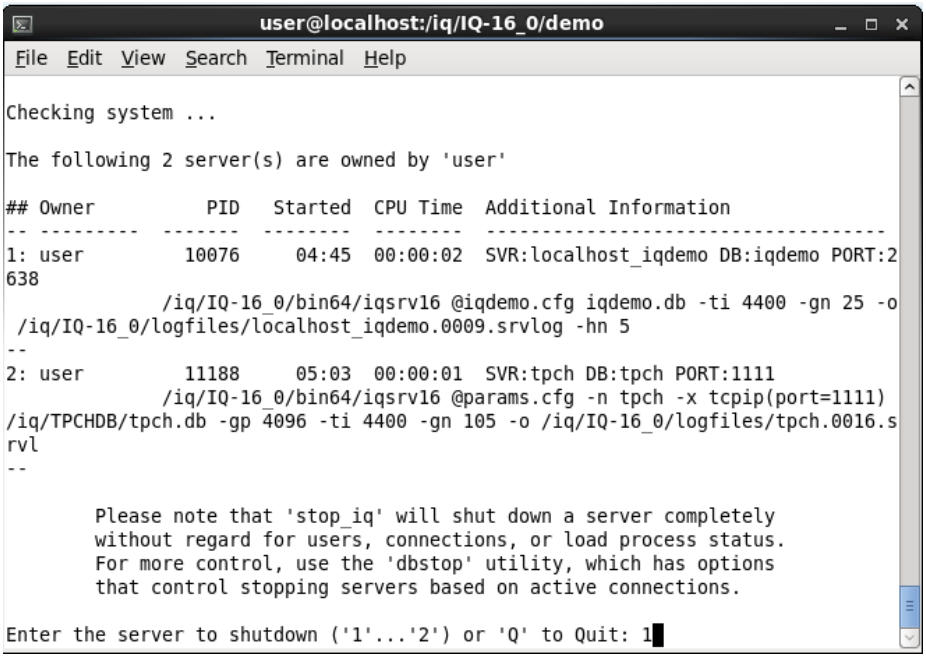
Close Sybase Control Center, either in the browser or in the terminal by either of the following commands (The first one is run by clicking “Ctrl-C” in the terminal which SCC was started in):

```
scc-console> ^C
```

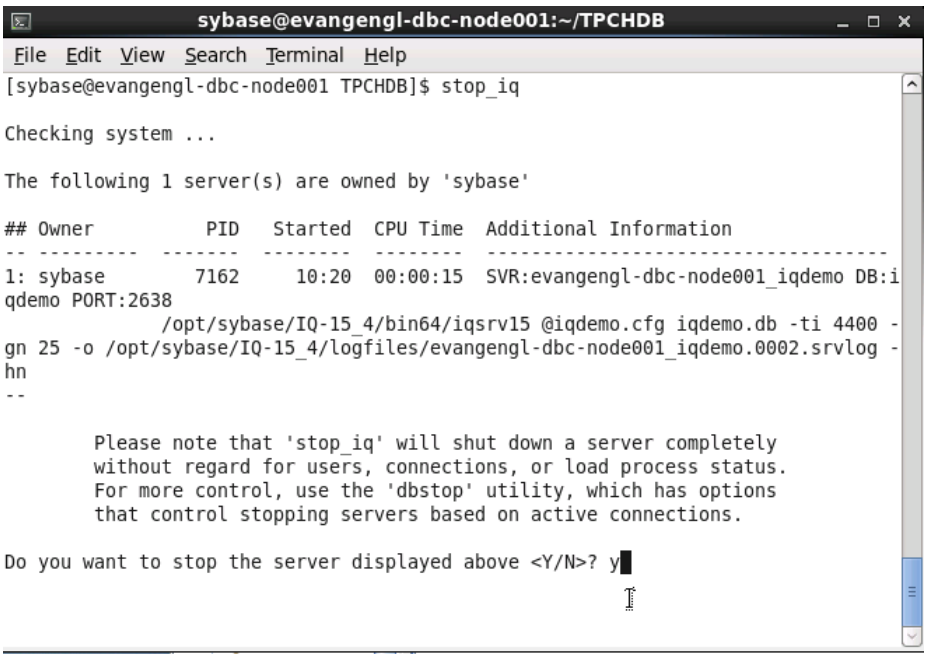
```
$SYBASE/SCC-3_2/bin/scc.sh -stop
```

We would like to now only look at the tpch server, but, first we need to edit the configuration settings. To do that, we will stop both servers.

At any time, a server can be shut down completely by issuing the command “stop_iq” from a terminal window. If multiple servers are running, the option to pick a server to shut down is given:



The next server can also be shut down, by running “stop_iq” again:



Choose “y” to shut down the server.

Next, create a text file called “tpch.cfg” in the directory where you created your database (in this example: “/opt/sybase/TPCHDB”). The file should have the following contents:

```
# tpch.cfg
# ------------------------------------------------------------------
# This file contains the default ASIQ startup parameters.  All servers
# started will default to these parameters, unless overridden by contents
# of parameter list.
# ------------------------------------------------------------------
# Must be in the format: One parameter per line
# ------------------------------------------------------------------

-n tpch

-c  32m
-gc 20
-gd all
-gl all
-gm 10
-gp 4096
-ti 4400

-iqmc 400
-iqtc 600

-o message.out

-zr sql
-zo iq.sql.out
```

This is the configuration file for starting up the SAP Sybase IQ database. The meaning of these parameters is as follows:

- -n tpch: specifies the name of the SAP Sybase IQ server
- -c 32m: sets initial memory reserved for caching catalog store pages
- -gc 20: sets the maximum interval between checkpoints
- -gd all: sets the permissions (anyone) required to start or stop a database
- -gl all: sets the permissions (anyone) required to load data using LOAD TABLE
- -gm 10: limits the number of concurrent connections to the server to 10
- -gp 4096: sets the maximum page size allowed, in bytes, for the catalog store
- -ti 4400: disconnect connections that haven’t submitted a request for the specified number of minutes (default is 4400 – or 72 hours)
- -iqmc 400: specifies the main IQ store cache size in MB
- -iqtc 600: specifies the temp IQ store cache size in MB
- -o message.out: prints all server messages to the server message log file (database messages go the file “<dbname>.iqmsg”)

- -zr sql: enables SQL statement logging
- -zo iq.sql.out: redirects SQL statement logging information to a file separate from the regular log file

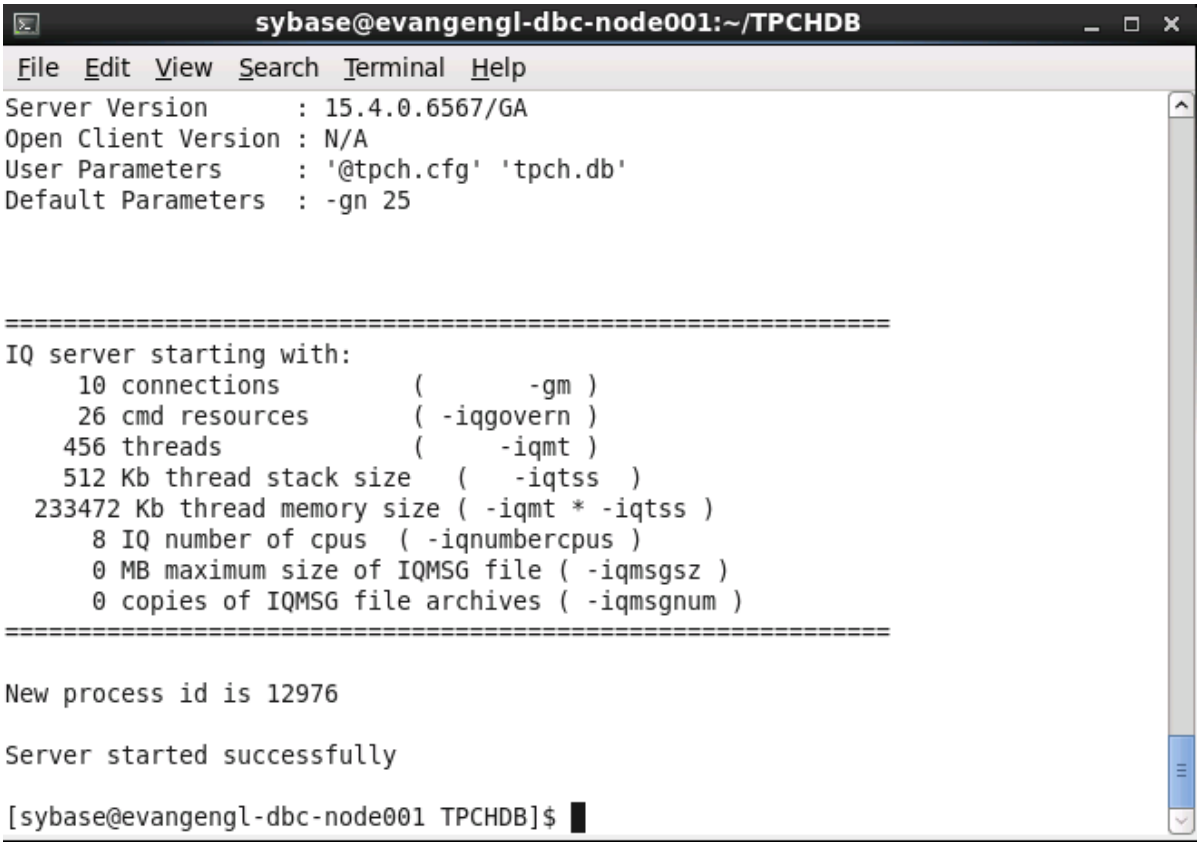
By default, the server listens on port 2638. You can, optionally, change this by adding a line to the tpch.cfg file similar to the following (server now listening on port 7878):

```
-x tcpip{port=7878}
```

You can start up the database from a terminal window by issuing the following command from the directory where you created the database file (in this example "/opt/sybase/TPCHDB"):

```
start_iq @tpch.cfg tpch.db
```

If the database starts up successfully, you will see messages similar to the following:



Now, we want to open the tpch server with Sybase Control Center.

Run the SCC command as earlier:

```
scc.sh
```

Register the resource as earlier. Now we have a tpch resource, with the required configuration, which connects to our database.
Note: This tpch server will be on port 2638 (or 7878, if specified), not the one on 1112 as used to create the database.

6. Summary

During this lesson, you have installed SAP Sybase IQ, validated the installation, and created a database. You have learned how to start your database and connect to it. The next step is to create a schema and load data into your database

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