

IBM Spectrum Control
Version 5.2.14

Quick Installation Guide



Note:

Before using this information and the product it supports, read the information in "Notices" on page 27.

This edition applies to version 5, release 2, modification 14 of IBM Spectrum Control (product numbers 5725-F93, 5725-G33, 5725-Y23, and 5725-Y24) and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC27-6585-05.

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About this guide

IBM Spectrum Control™ manages storage infrastructure by centralizing, automating, and simplifying the management of complex and heterogeneous storage environments. Use this guide to complete the steps that are required to install these products, including planning for installation and configuration.

Who should read this guide

This publication is intended for administrators or users who are installing IBM Spectrum Control on a single server.

Administrators and installers should be familiar with the following topics:

- General procedures for installing software on Microsoft Windows, IBM® AIX®, and Linux.
- Storage Area Network (SAN) concepts
- IBM Spectrum Control concepts
- IBM DB2® Database for Linux, AIX, and Windows
- Simple Network Management Protocol (SNMP) concepts

Publications

A number of publications are provided with IBM Spectrum Control.

IBM Tivoli® Storage Productivity Center for Replication is no longer installed with IBM Spectrum Control. For current Tivoli Storage Productivity Center for Replication users who upgrade to IBM Spectrum Control, Tivoli Storage Productivity Center for Replication will remain available. See IBM Knowledge Center for any earlier versions of Tivoli Storage Productivity Center for Replication publications.

The following section describes how to access these publications online.

Accessing publications online

Publications for this product and other related products are available online.

Information about installing, configuring, upgrading, and uninstalling IBM Spectrum Control and related products is available online. Use Table 1 to view and download these publications. Translated documents are available for some products.

Table 1. Locations of publications for IBM Spectrum Control and related products

Product	Online location
IBM Spectrum Control	<p>http://www.ibm.com/support/knowledgecenter/SS5R93/</p> <p>In the navigation pane, click the release of IBM Spectrum Control that you want.</p> <p>To obtain PDF documents for a release of IBM Spectrum Control, click the release and then click Printable documentation.</p>

Table 1. Locations of publications for IBM Spectrum Control and related products (continued)

Product	Online location
IBM DB2 Database for Linux, UNIX, and Windows	http://www.ibm.com/support/knowledgecenter/SSEPGG/welcome
Jazz™ for Service Management	http://www.ibm.com/support/knowledgecenter/SSEKCU/welcome
IBM WebSphere® Application Server Network Deployment	http://www.ibm.com/support/knowledgecenter/SSEQTP/mapfiles/product_welcome_was.html
IBM WebSphere Application Server Liberty	https://www.ibm.com/support/knowledgecenter/SSEQTP_liberty/as_ditamaps/was900_welcome_liberty.html

Downloading publications

IBM publications are available in electronic format to be viewed or downloaded free of charge.

You can download IBM publications from <http://www.ibm.com/support/knowledgecenter/>.

Accessibility features for IBM Spectrum Control

Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully.

To read about the accessibility features for IBM Spectrum Control, go to the product documentation at http://www.ibm.com/support/knowledgecenter/S55R93_5.2.14/com.ibm.spectrum.sc.doc/fqz0_r_accessibility.html.

For more information about IBM's commitment to accessibility, see the IBM Human Ability and Accessibility Center website at <http://www.ibm.com/able/>.

Chapter 1. Planning

The following sections provide information to help plan your IBM Spectrum Control environment before you install the product.

In addition to IBM Spectrum Control, the product environment includes the following components:

DB2 IBM Spectrum Control stores the information that it collects about storage resources in a DB2 database.

You must install DB2 before you install IBM Spectrum Control..

Cognos® BI Reporting (optional)

Cognos Business Intelligence is an optional tool for producing reports from the data that is gathered by IBM Spectrum Control. The Cognos BI reporting tool is not required to produce report information. You can generate and view information that is related to your storage resources directly in the IBM Spectrum Control GUI.

You can use the optional Cognos BI reporting tool to run, schedule, and deliver predefined and custom reports. These reports include information about storage capacity, assets, and performance of storage systems, switches, fabrics, servers, hypervisors, and their internal resources. You can create the reports in HTML, PDF, and other formats. You can also configure reports to save the report output to your local file system, and to send reports as email attachments.

Note: If you plan to use Cognos BI reports, you must install Jazz for Service Management Version 1.1.0.3 and Tivoli Common Reporting Version 3.1.0.2.

Hardware requirements

The IBM Spectrum Control server can require a large amount of memory, disk space, network bandwidth, and processor resources. In many cases, the server performs best when other applications are not installed on the same system.

These values are general recommendations to install IBM Spectrum Control:

Processor

These are the recommended processor values:

- Intel Xeon or greater, at least 4 processors at 2.5 GHz CPUs (Windows or Linux)
- IBM POWER5 or later, at least 4 processors at 2.3 GHz CPUs (AIX)

Memory

At least 8 GB of RAM

Disk Space

These are the recommended disk space values:

- 15 GB (Windows and Linux)
- 22 GB (AIX)

For the latest information about the hardware and software requirements for IBM Spectrum Control, see the support matrix at <http://www.ibm.com/support/docview.wss?uid=swg21386446>.

Software requirements for LDAP servers

LDAP repositories, that are available on Windows, Linux and AIX operating systems, can be used with IBM Spectrum Control.

The IBM Spectrum Control installation program establishes a default authentication configuration using the federated repositories feature of the WebSphere Application Server. You can add an LDAP repository to this authentication configuration as a post-installation activity.

For information about the LDAP repositories that are supported, see one of the following WebSphere Application Server Liberty web pages. On the **Supported Software** tab, click **LDAP Servers**. See, <https://ibm.co/2pA5yGL>

Requirements for Jazz for Service Management and Tivoli Common Reporting

If you plan to use Cognos Business Intelligence reports, you must install Jazz for Service Management Version 1.1.0.3 and IBM Tivoli Common Reporting Version 3.1.0.2.

For more information about the requirements to install Jazz for Service Management Version 1.1.0.3 and IBM Tivoli Common Reporting Version 3.1.0.2, go to the *Jazz for Service Management Detailed System Requirements* document at <http://www.ibm.com/support/docview.wss?uid=swg27038732>.

Attention: You must install Jazz for Service Management from the IBM Spectrum Control installation program. For more information about installing IBM Spectrum Control, see “Installing IBM Spectrum Control in a single-server environment” on page 17.

Chapter 2. Installing DB2

Before you install IBM Spectrum Control, you must install DB2 as the database repository. You can install DB2 on Linux, AIX, or Windows.

Verify that the target server meets the prerequisites for DB2. To verify the prerequisites, run the DB2 **db2prereqcheck** command on the server.

DB2 Version 11.1 is shipped with IBM Spectrum Control and the installation instructions that are in this guide are for this version.

Although DB2 Version 11.1 is provided with IBM Spectrum Control, you can use another version of DB2 that IBM Spectrum Control supports. For a list of DB2 versions that you can use with IBM Spectrum Control, go to <http://www.ibm.com/support/docview.wss?uid=swg27047043#Databases>.

Installing DB2 on Windows

You can install DB2 on servers that run the Windows operating system.

Preparing to install DB2 on Windows

If you have an administrator user ID that you want to use to install DB2 and IBM Spectrum Control, this user ID must be a member of the DB2ADMNS and the Administrator groups.

When you install DB2, these groups are created:

- DB2ADMNS, which has all the required user rights that are assigned for administrative authority
- DB2USERS, which has user rights that are assigned to DB2 users

Assign users who need administrative authority to the DB2ADMNS group and DB2 users to the DB2USERS group. When you assign a user ID to either group, the user ID has all the user rights required for that group. You do not have to assign individual user rights to each user ID.

Important: The Windows Administrator user ID does not have the authority to create the IBM Spectrum Control database TPCDB. The DB2 administrator user ID that you need when you install IBM Spectrum Control must have DB2 administrative rights. The user ID that you need to install IBM Spectrum Control must be a member of the DB2ADMNS and Administrator groups. The DB2 user ID db2admin, which was created when you installed DB2, has the authority for IBM Spectrum Control. For valid DB2 user IDs and passwords, go the product documentation at http://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.admin.dboj.doc/doc/c0007248.html.

When you assign the Windows Administrator user ID to the DB2ADMNS group, this authority is active the next time the Administrator user ID logs in.

8.3 short file names

If DB2 is installed on a drive on which 8.3 file names are disabled, and the DB2 installation directory name has spaces in it, DB2 must be reinstalled on a drive that has 8.3 file names enabled, or in a directory that does not have spaces in the name.

To check the current 8.3 file name settings for a drive, in a DB2 command window, run the `'fsutil.exe behavior query disable8dot3'` command.

These are the values when you run the command:

- 0 = Create 8.3 short file names (default)
- 1 = Do not create 8.3 file names
- 2 = Set 8.3 file names on a per volume basis
- 3 = Disable 8.3 file names on all volumes, except the system volume

The registry state of `NtfsDisable8dot3NameCreation` is 0, which means that 8.3 file names are enabled on all volumes.

To enable 8.3 file names on a global basis, run the `fsutil.exe behavior set disable8dot3 0` command.

Installing DB2 on Windows

You can install DB2 on Windows by using a graphic user interface (GUI) installation program.

Note: Windows platforms do not support systems that are configured only for IPv6. (Windows is enabled for IPv6 and IPv4.)

To install DB2 on a Windows operating system, complete the following steps:

1. Log on with a user ID that has Administrator authority on Windows.
2. Use the extracted DB2 installation image. Windows Autorun starts the launchpad.

If you are using Windows Autorun, the installation program should start in 15-30 seconds. If the installation program does not start, complete one of the following steps:

- In a command prompt, to start the DB2 set up page, go to `web_image_extraction\server_folder` and run the `setup.exe` command.
- In Windows Explorer, go to `web_image_extraction\server_folder`, and double-click the `setup.exe` file.

Where `server_folder` in the preceding steps is the location of the DB2 installation program.

3. In the DB2 Setup Launchpad, click **Install a Product**.
4. Click **Install New for DB2 Version 11.1 Workgroup, Enterprise and Advanced Editions**.
5. On the welcome page of the DB2 Setup program, click **Next**.
6. On the Software License Agreement page, review and accept the license agreement, and click **Next**.
7. On the Select the installation type page, click **Typical**, and click **Next**.
8. On the Select the installation, response file creation, or both page, select **Install DB2 Server Edition on this computer and save my settings in a response file**.

9. Enter a response file name or accept the default, and click **Next**.
10. On the Select the installation folder page, enter a directory or accept the default, and click **Next**.
11. On the Select the IBM SSH server installation folder and startup option page, enter a directory or accept the default, and click **Next**.
12. On the Set user information for the DB2 Administration Server page, enter the following user information:
 - a. Leave the **Domain** field blank.
 - b. In the **User name** field, type the DB2 user ID that you want to use or accept the default.
 - c. In the **Password** field, type a password and confirm the password by typing it again in the **Confirm password** field.
13. Select the **Use the same account for the remaining DB2 services** check box and click **Next**.
14. On the Configure DB2 instances page, click **Next**.
15. On the Set up notifications page, clear the **Set up your DB2 server to send notifications** check box, and click **Next**.
16. On the Enable operating system security for DB2 objects page, accept the defaults, and click **Next**.

The default is to enable operating system security.

Note: If you installed DB2 before on this system, and the DB2ADMS group exists, when you click **Next**, the following message is displayed:

```
Warning
The group name "DB2ADMS" already exists
in the system and will be granted complete
access to the DB2 folders and objects through
the operating system.
Click OK to continue installation, or click
Cancel to input another group name.
```

17. On the Start copying files and create response file page, review the current settings, and click **Finish**.
18. On the Setup is complete page, review the information, and click **Next**.
19. On the Install additional products page, do not install more products, click **Finish**. The setup program closes and DB2 First Steps interface opens.
20. Restart the system.

Installing DB2 on AIX or Linux

You can install DB2 as a root user or non-root user on an AIX or Linux operating system. To install DB2 as a non-root user, the user must have full sudo privileges on the target AIX or Linux server.

Preparing to install DB2 on UNIX or Linux

To operate DB2 on operating systems such as UNIX or Linux, the instance owner, the fenced user, and the DB2 administration server user are required. These users and groups are automatically created when DB2 is installed.

The user ID you need to install IBM Spectrum Control must be the owner of the instance that you want to use; this user ID and password are created when you install DB2.

Table 2 provides a list of the default user and group names.

Table 2. DB2 setup default user and group names

Required user	Default user name	Default group name	Description
instance owner	db2inst1	db2iadm1	Created in the instance owner home directory. This user ID controls all DB2 processes and owns all file systems and devices used by the databases contained within the instance.
fenced user	db2fenc1	db2fadm1	Used to run user-defined functions and stored procedures that are separate from the address space that is used by the DB2 database.

Note: For valid DB2 user IDs and passwords, see http://www-01.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.admin.dbobj.doc/doc/c0007248.html.

Installing DB2 on AIX or Linux

You can install DB2 Enterprise Server Edition as a root user or non-root user on an AIX or Linux operating system by using the DB2 Setup program. To install DB2 as a non-root user, the user must have sudo privileges on the target AIX or Linux server.

The X Window System is required on the AIX or Linux server to install DB2 by using the installation program.

If you want to install DB2 as a non-root user, have your system administrator complete the following tasks on the target server before you begin the installation:

- If you are installing DB2 on an AIX server, install sudo on the server. The default AIX distribution does not include sudo. To get the sudo installation package, go to <http://www.ibm.com/systems/power/software/aix/linux/toolbox/date.html>. Find **sudo-version** in the **Package** column, and click **RPM** to download the package.
- Ensure that the non-root user has sudo privileges for the following commands on the server:
 - **xauth** (Enables the non-root user to provide access to their X Window System display for the root user.)
 - **db2setup** (Enables the non-root user to launch the DB2 installation program.)

You must enter the full path to the commands when you configure the sudo privileges. For example:

```
username ALL=(root) SETENV: /usr/bin/xauth,/home/username/Downloads/DB2/server_t/db2setup
```

- Ensure that the following requirements are met to enable the installation of DB2 by using the Setup program:

- The non-root user is able to use the X Window System on the target server and the X Window System DISPLAY environment variable is set correctly for the not-root user.
- The DISPLAY environment variable is preserved in the sudo environment.
- The root user has access to the X Window System display that is owned by the non-root user.

These display requirements do not apply if you install DB2 in silent mode.

- If you are installing DB2 on an AIX server, ensure that the ODMDIR environment variable is preserved in the sudo environment.

To install DB2, complete the following steps:

1. Log on to the target server as the root user or as a non-root user who has sudo privileges.
2. Use an extraction tool to extract the installation image files on the server.
3. In a command shell, change the directory to the location of the DB2 installation program db2setup, and then enter one of the following commands:
 - Root user**
./db2setup
 - Non-root user**
sudo ./db2setup
4. On the DB2 Setup Welcome page, click **New Install**.
5. On the Choose a Product page, select **DB2 Version 11.1 Workgroup, Enterprise and Advanced Editions** and click **Next**.
6. On the Confirmation page:
 - a. Enter an installation directory or accept the default.
 - b. Select **Typical** as the installation type.
 - c. Select **Create an instance**.
 - d. Review and agree to the IBM terms.
 - e. Click **Next**.
7. On the Instance Owner page, select **New user**, and enter the following information:
 - a. User name
DB2 adds this user ID to the db2i adm1 group, and if this user ID does not exist, DB2 creates it.
 - b. Group name
 - c. Password
 - d. Home directory
The DB2 instance owner user is the user that you enter when you install IBM Spectrum Control.
8. Select **Use default UID** and **Use default GID**, and click **Next**.
9. On the Fenced User page, select **New user**, and enter the following information:
 - a. User name
DB2 adds this user ID to the db2i adm1 group, and if this user ID does not exist, DB2 creates it.
 - b. Group name
 - c. Password

- d. Home directory
 - The fenced user is used to run user-defined functions and stored procedures that are separate from the address space that is used by the DB2 database.
10. Select **Use default UID** and **Use default GID**, and click **Next**.
11. On the Response File and Summary page:
 - a. Select **Install DB2 Server Edition on this computer** and save my settings in a response file.
 - b. Enter a response file name or accept the default.
 - c. Review the Summary and click **Finish**.
12. On the Setup has completed successfully page, review the information, and click **Finish**.

To ensure that DB2 starts when the server starts, run the **db2iauto** command.

Root user

```
DB2_installation_directory/bin/db2iauto -on DB2_instance_name
```

Non-root user

```
sudo DB2_installation_directory/bin/db2iauto -on DB2_instance_name
```

Where *DB2_installation_directory* is the location of DB2 and *DB2_instance_name* is the instance that you created when you installed DB2. The default instance name is *db2inst1*.

Installing DB2 on AIX by using the command-line

You can install DB2 Enterprise Server Edition on AIX operating systems by using commands.

Ensure that you have:

- 2 - 3 GB of hard disk drive space for the DB2 installation tar file and extracted files.
- A file system with at least 30 GB for the IBM Spectrum Control repository.

To install DB2 on the AIX operating system by using a command prompt, complete the following steps:

1. Log in with a user ID that has root authority.
2. Do one of the following steps.
 - If you are not using a DVD, skip to step 5 and work from the directory where you have the DB2 source installation program.
 - If you are using a DVD, create a mount point that is called /cdrom by entering `mkdir /cdrom`.
3. Insert the DB2 DVD into the DVD drive and mount the file system at the mount point. On AIX operating system, you can use the **crfs** command to add an entry to `/etc/filesystems` for the mount point.
4. Run the following commands:

```
/usr/sbin/crfs -v cdrfs -p ro -d'cd0' -m'/cdrom' -A'no'
mount /cdrom
```

The **crfs** command must be run only one time for a mount point. For each DVD you insert after that, you can use **mount** and **umount**, for example, **mount /cdrom** and **umount /cdrom**.

5. Enter `cd /cdrom` and go to the directory where the DVD-ROM is mounted.
6. Install the DB2 Manager.
 - a. Create a temporary directory (for example, `db2temp`) to hold the DB2 installer tar file and extracted files.
 - b. Copy or download the DB2 installer into `db2temp`. The name of the file varies depending on the location from where the file is downloaded or copied and the language to which it is associated.
 - c. Optional: If the DB2 installer file is compressed, use the appropriate extracting tool. For example, if the name of the file is `v11.1_aix64_server.tar.gz`, enter **gunzip v11.1_aix64_server.tar.gz**. In this example, `v11.1_aix64_server.tar.gz` is displayed in the `db2temp` directory.
 - d. Create an installation directory by entering, for example, `mkdir install`.
 - e. Enter `cd install` to change to the new installation directory.
 - f. Extract the DB2 installation file. For example, if the name of the installation file is `v11.1_aix64_server.tar`, enter `tar xvf ../v11.1_aix64_server.tar`.
 - g. Enter `cd /db2temp/install/server_t` and go to the directory that contains the DB2 installation program `db2_install`.
 - h. Enter `./db2_install` to run the command-line installation program.
 - i. Select **SERVER**.
 - j. Select **no** from the Do you want to install the DB2 pureScale Feature? [yes/no] section. The Installation Summary is displayed, which indicates a successful installation. DB2 is installed in `/opt/IBM/db2/V11.1`.
7. Create users and groups for use with DB2.
 - a. Enter `mkgroup id=999 db2iadm1`.
 - b. Enter `mkgroup id=998 db2fadm1`.
 - c. Enter `mkuser id=1004 pgrp=db2iadm1 groups=db2iadm1 home=/home/db2inst1 db2inst1`.
 - d. Enter `mkuser id=1003 pgrp=db2fadm1 groups=db2fadm1 home=/home/db2fenc1 db2fenc1`.
 - e. Verify the owner of the directories by entering `ls -ld /home/db2inst1`. The directory ownership is displayed as follows:
 - `/home/db2inst1` shows group `db2iadm1` and user `db2inst1`
 - `/home/db2fenc1` shows group `db2fadm1` and user `db2fenc1`If the directory ownership is not correct, run the following commands as appropriate:

```
chown -R db2inst1:db2iadm1 /home/db2inst1
chown -R db2fenc1:db2fadm1 /home/db2fenc1
```
 - f. Enter `passwd db2inst1` to set the password that you want to use for the DB2 instance.
 - g. Enter `pwdadm -f NOCHECK db2inst1`.
 - h. Enter `passwd db2fenc1` to set the password you want to use for the fenced user.
 - i. Enter `pwdadm -f NOCHECK db2fenc1`.
 - j. Enter `chgroup users=db2inst1,root db2iadm1`.
8. Create a DB2 instance:

- a. Enter `/opt/IBM/db2/V11.1/instance/db2icrt -a server -u db2fenc1 db2inst1`.
- b. Enter `./home/db2inst1/sqllib/db2profile`.
9. Change the default location for database repositories. By default, the location is `/home/db2inst1`. The `/home` output is typically not large enough for database repositories.
10. To change the default location:
 - a. Enter `db2 update dbm cfg using DFTDBPATH new_repository_path IMMEDIATE`, where *new_repository_path* represents the new location for the repository.
 - b. Enter `chown -R db2inst1:db2iadml new_repository_path` to assign ownership to `db2inst1` and permission to anyone in `db2iadml` (same as the ownership for `/home/db2inst1`).
11. Configure DB2 communication:
 - a. Edit `/etc/services` and verify or add the following line at the end of the file: `db2c_db2inst1 50000/tcp`
 - b. Enter `db2 update dbm cfg using svcename db2c_db2inst1`.
 - c. Enter `db2set DB2COMM=tcpip`.
 - d. Enter `db2stop`
 - e. Enter `db2start`
12. From a command prompt, do the following to test your DB2 instance:
 - a. Enter `./home/db2inst1/sqllib/db2profile` to source the environment.
 - b. Enter `db2level` to get information about the instance and DB2.
 - c. Enter `db2 create db test`.
 - d. Enter `db2 list db directory` to list information about all the databases that are created for this instance.
 - e. Enter `db2 connect` to test user `db2inst1` using the password to connect to the database.
 - f. Enter `db2 disconnect test` to disconnect from the test database.
 - g. Enter `db2 drop db test` to drop the test database.

Installing DB2 on AIX 6.1 POWER7 Systems

You can install DB2 on AIX 6.1 POWER7[®] Systems.

Ensure that you run `export JAVA_COMPILER=none` from a command window. This command is necessary as a result of APAR IC63450.

For more information about installing DB2, see http://www-01.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.server.doc/doc/c0008711.html.

1. Log on using a user ID with root authority.
2. Work from the directory where you have the DB2 source installation program
3. Run the following command from the installation image:

```
./db2_install
```

Enter the necessary information.

Note: If the following message is displayed:

```
WARNING: A minor error occurred while installing
```

Check the installation log for errors. If you do not see any errors, ignore this warning message.

4. Create DB2 groups, users, and instances.
 - a. For the DB2 groups, run the following commands.

```
mkgroup id=999 db2iadm1
mkgroup id=998 db2fadm1
```
 - b. For the DB2 users, run the following commands.

```
mkuser id=1004 pgrp=db2iadm1 groups=db2iadm1
home=/home/db2inst1 db2inst1
mkuser id=1003 pgrp=db2fadm1 groups=db2fadm1
home=/home/db2fenc1 db2fenc1
```
 - c. Set the password for db2inst1 and db2fenc1 by running the following commands:

```
passwd db2inst1
passwd db2fenc1
```
 - d. Setting the new passwords might require that you log in one time to change the initial password.

```
login db2inst1
```

Change the initial password and replace with a new password. Repeat this step for the db2fenc1 user.
 - e. Create the db2inst1 instance by running the following command:

```
/opt/IBM/db2/v10.5/instance/db2icrt -a server -u db2fenc1 db2inst1
```
5. Assign a communication port for the DB2 instance in the /etc/services file.
 - a. Select a name that is related to the instance name.
 - b. Select a free port, for example, 50000. Add the following line to the /etc/services file:

```
db2inst1c 50000/tcp
```
6. Configure the communication port in the database manager configuration for the instance:

```
db2 update dbm cfg using SVCENAME db2inst1c
```
7. Enable TCP/IP for the instance:

```
db2set DB2COMM=TCPIP
```

Note: After you install DB2, edit the file /etc/group and add root to the db2iadm1 group. The db2iadm1 line in /etc/group looks like the following line.

```
db2iadm1:x:102:root
```

Chapter 3. Installing IBM Spectrum Control

The following information and instructions pertain to installing IBM Spectrum Control on a single server.

For information about installing IBM Spectrum Control in a multiple-server environment, go to the product documentation at http://www.ibm.com/support/knowledgecenter/SS5R93_5.2.14/com.ibm.spectrum.sc.doc/fqz0_r_installing_tpc_multiple_server.html.

You can install IBM Spectrum Control in a single-server environment in one of the following ways:

- The installation program

For information about installing IBM Spectrum Control by using the installation program, see “Installing IBM Spectrum Control in a single-server Windows environment” on page 17.

- The command line in silent mode

For information about installing IBM Spectrum Control by using silent mode, go to the product documentation at http://www.ibm.com/support/knowledgecenter/SS5R93_5.2.14/com.ibm.spectrum.sc.doc/fqz0_t_installing_tpc_silent_mode_single_server.html.

IBM Spectrum Control installation

You can install IBM Spectrum Control by using the installation program or the command-line in silent mode. Installing IBM Spectrum Control by using console mode is not supported.

Fully qualified host names

Some systems might be configured to return a short host name such as `server22`, instead of a fully qualified host name such as `server22.myorg.mycompany.com`. IBM Spectrum Control requires fully qualified host names, so you must install the product on a computer that has a fully qualified host name.

Installation methods

You can install IBM Spectrum Control by using the installation program or the command-line in silent mode. In silent mode, a command is provided with the values in a response file.

Use the installation program to install IBM Spectrum Control with minimal user interaction. Use the silent-mode installation if your system is running from a terminal that cannot display graphics.

Important: On UNIX operating systems (for example, AIX or Linux) you must have X Window System support to display the installation program graphical user interface (GUI).

Installation images

Installation files for the following components are provided with IBM Spectrum Control:

DB2

- DB2 for Windows (64-bit)
- DB2 for Linux (64-bit)
- DB2 for AIX (64-bit)

IBM Spectrum Control

- IBM Spectrum Control for AIX
- IBM Spectrum Control for Linux
- IBM Spectrum Control for Windows

In addition, installation files for the following optional agents are available with IBM Spectrum Control:

- IBM Spectrum Control Storage Resource agent for Windows
- IBM Spectrum Control Storage Resource agent for UNIX
- IBM Spectrum Control Monitoring Agent for IBM Tivoli Monitoring on Windows
- IBM Spectrum Control Monitoring Agent for IBM Tivoli Monitoring on UNIX

Jazz for Service Management and Tivoli Common Reporting (optional)

- Jazz for Service Management Version 1.1.0.3
- Tivoli Common Reporting Version 3.1.0.1
- Tivoli Common Reporting Version 3.1.0.2
- IBM WebSphere Application Server Version 8.5.0.1

On Windows operating systems, assign the appropriate security settings for the DB2, IBM Spectrum Control, Jazz for Service Management and Tivoli Common Reporting compressed files by completing the following steps:

1. Right-click one of the compressed installation files.
2. Examine the **General** tab and determine whether the **Unblock** button is displayed.
3. If the **Unblock** button is displayed:
 - a. Right-click the compressed file and click **Properties**.
 - b. On the **General** tab, next to **Security**, click **Unblock**.

Starting the installation programs

There are various methods to start the IBM Spectrum Control installation programs and on various operating systems.

Installation program methods

You can use these methods to start the installation programs:

Installation images

You must select an installation image and download and extract these images to a location with adequate disk space.

Storage Resource agent

Contains the files to run local Storage Resource agent installations. You must download the file for the system on which you want the agent to be in.

- The Storage Resource agent location and operating system file name is the same as the product electronic image.
- The Storage Resource agent image is in *installation_dir/data/sra/operating_system_name*.

The operating systems that are supported for the Storage Resource agents are listed in the following table.

Table 3. Operating system for Storage Resource agents.

Operating system	Operating system name
Windows	windows
AIX	aix_power
HP-UX	hp-ux_itanium
Linux x86	linux_ix86
Linux for Power Systems™ Servers	linux_power
Linux s390	linux_s390
Oracle Solaris	solaris_spark

Important:

- If you are using IBM Spectrum Control electronic installation images that are decompressed in a directory that has spaces in the name, IBM Spectrum Control does not install correctly.

For example, if you have the following directory name:

- On Windows operating systems:
C:\Spectrum Control\disk\SC
- On AIX and Linux operating systems:
/temp/Spectrum Control/disk/SC

IBM Spectrum Control does not install correctly.

When you remove the spaces, and rename the directory, for example:

- On Windows operating systems:
C:\SpectrumControl\disk\SC
- On AIX and Linux operating systems:
/temp/SpectrumControl/disk/SC

IBM Spectrum Control installs correctly.

- If you are using IBM Spectrum Control electronic installation images for Linux or AIX operating systems and you download the images to a directory, ensure that your folder name *does not* contain a . at the end of the folder name.

For example, if you have a directory name

C:\SpectrumControl\disk\SC.

When you rename the folder and remove the . at the end of the name, for example:

C:\SpectrumControl\disk\SC.August3

IBM Spectrum Control installs correctly.

- If you are deploying the Storage Resource agent on the AIX or Linux operating system, you must use root as the user name.

Starting the installation program on the Windows operating system

To start the IBM Spectrum Control installation program by using an electronic image, complete the following steps.

1. Download the image into a directory.
2. Extract the image files.
3. At the command prompt, enter `cd source_installation_directory\SC` and then enter **setup.bat**.

Starting the installation program on the Linux operating system

To start the IBM Spectrum Control installation program from the electronic image, complete the following steps.

1. Enter the following to create a directory:


```
mkdir /SpectrumControl
```
2. Download the image into the SpectrumControl directory.
3. Enter this command to extract the image files:


```
tar -xvzf filename.tar.gz
```
4. Ensure that the user name that you plan to use as the IBM Spectrum Control common user is in the root group and the db2iadm1 group. If the user name is not in a group, you can add the user as shown in the following example commands. In these examples, the user name is *db2inst1*.


```
usermod -a -G root db2inst1
usermod -a -G db2iadm1 db2inst1
```
5. Navigate to the /SpectrumControl/SC directory by entering:


```
cd /SpectrumControl/SC
```
6. Set up your shell environment to point to the instance where the database repository is installed. Source the db2profile for the instance that you want. For example, if the DB2 instance is db2inst1, you can source the db2profile by entering:


```
./home/db2inst1/sqllib/db2profile
```

Remember: There is a space between `.` and `/home`.
7. Start the installation program by running the **./setup.bin** command from the same command shell that you used in step 6.

Starting the installation program on the AIX operating system

To start the IBM Spectrum Control installation program from the electronic image, complete the following steps:

1. Enter the following to create a directory:


```
mkdir /SpectrumControl
```
2. Download the image into the SpectrumControl directory.
3. Enter this command to extract the image files:


```
tar -xvzf filename.tar.gz
```
4. Ensure that the user name that you plan to use as the IBM Spectrum Control common user is in the system group and the db2iadm1 group. If the user name

is not in a group, you can add the user as shown in the following example commands. In these examples, the user name is *db2inst1*.

```
usermod -G system db2inst1
usermod -G db2iadm1 db2inst1
```

5. Navigate to the `/SpectrumControl/SC` directory by entering:
`cd /SpectrumControl/SC`
6. Set up your shell environment to point to the instance where the database repository is installed. Source the `db2profile` for the instance that you want. For example, if the DB2 instance is `db2inst1`, you can source the `db2profile` by entering:
`. /home/db2inst1/sqllib/db2profile`
Remember: There is a space between `.` and `/home`.
7. Start the installation program by running the `./setup.bin` command from the same command shell that you used in step 6.

Installing IBM Spectrum Control in a single-server environment

Installing IBM Spectrum Control in a single-server environment is a simple process and can be completed successfully by most IBM Spectrum Control customers.

Installing IBM Spectrum Control in a single-server Windows environment

You can install IBM Spectrum Control by using the IBM Spectrum Control installation program.

1. Log on to the target server a user who has administrator privileges.
2. When you install IBM Spectrum Control, the TPCDB database is created in the location that you specify in the `DB2 DFTDBPATH` variable. To determine the current `DFTDBPATH` value, run the following command in a DB2 CLI window:
`get dbm cfg`

If you want to install this database in a location that is other than the default location, run the following command in a DB2 CLI window:

```
update dbm cfg using DFTDBPATH path
```

where *path* is the new value for the `DFTDBPATH` variable.

3. Use an extraction tool to extract the installation image files on the server.
If you plan to install Jazz for Service Management and Tivoli Common Reporting, ensure that the installation files for IBM Spectrum Control are in one directory and the installation files for Jazz for Service Management and Tivoli Common Reporting are in another directory.
4. In a command window, change the directory to the location of the IBM Spectrum Control installation files and enter the following command:
`setup.bat`
5. Review the Welcome page and make one of the following decisions:
 - If Jazz for Service Management is installed on your computer, the Welcome page displays a green check mark. Click **Next** to proceed to the next page in the IBM Spectrum Control installation program and install IBM Spectrum Control with reports.
 - If Jazz for Service Management is not installed on your computer, the Welcome page displays an **Install Now** button.

- If you do not want to install Jazz for Service Management on your computer, click **Next** to proceed to the next page in the IBM Spectrum Control installation program and install IBM Spectrum Control without reports.
6. If Jazz for Service Management is not installed, and you want to install it on your computer, you can install it now:
 - a. On the Welcome page, click **Install Now**.
 - b. On the Install Jazz for Service Management page, complete the following steps:
 - 1) Provide the location where the Jazz for Service Management and Tivoli Common Reporting installation files were extracted.
For example, `c:\temp\jazzinstall`.
 - 2) If there is a port conflict, specify a new starting value for a 15-port range, and click the **Verify Port Availability** link to ensure that the port range is usable.
 - 3) Click **Install Now**.
The IBM Spectrum Control installation program pauses and the Jazz for Service Management launchpad starts.
 - c. When you exit the Jazz for Service Management launchpad, you are returned to the Install Jazz for Service Management page in the IBM Spectrum Control installation program. Click **OK**.
 - d. If the installation of Jazz for Service Management was successful, you are returned to the Welcome page, which now displays a green check mark. If the installation of Jazz for Service Management was not successful, a message is displayed, and you can click one of the following options:
 - **Install Now**, which starts the Jazz for Service Management launchpad again.
 - **Continue**, which returns you to the Welcome page.
 - e. On the Welcome page, click **Next**.
 - f. On the Choose Installation Location and Type page, select **Single Server**, and click **Next**.
 7. If the installation of Jazz for Service Management was successful and you clicked **Next** on the Welcome page to install IBM Spectrum Control with reports, on the Configure Jazz for Service Management and Tivoli Common Reporting page, enter the following information, and click **OK**:
 - The user name that is used to log on to the Jazz for Service Management WebSphere profile.
 - The password that is associated with the user name.
 - The path for the Jazz for Service Management installation directory.

Jazz for Service Management starts. After Jazz for Service Management starts, it might take some time before all components, including Tivoli Common Reporting, are running.

If the IBM Spectrum Control installation program is unable to communicate with Jazz for Service Management, you can select the **Install IBM Spectrum Control reports later** check box, click **OK**, and continue installing IBM Spectrum Control without reports. After you install IBM Spectrum Control without reports, and resolve any problems with Jazz for Service Management, start the IBM Spectrum Control installation program again to install IBM Spectrum Control reports.

Important: If the installation of Jazz for Service Management was not successful and you clicked **Next** on the Welcome page to install IBM Spectrum

Control without reports, the Configure Jazz for Service Management and Tivoli Common Reporting page does not display.

8. Follow the prompts in the installation program to install IBM Spectrum Control.

If an error occurred during the IBM Spectrum Control installation process, review the IBM Spectrum Control installation log files to find details about the error.

Installing IBM Spectrum Control in a single-server AIX or Linux environment

You can install IBM Spectrum Control as a root user or non-root user on an AIX or Linux operating system by using the IBM Spectrum Control installation program. To install IBM Spectrum Control as a non-root user, the user must have sudo privileges on the target AIX or Linux server.

Ensure that X Window System is installed on the target AIX or Linux server. The X Window System is required to install IBM Spectrum Control by using the installation program.

If you want to install IBM Spectrum Control as a non-root user, have your system administrator complete the following tasks on the target server before you begin the installation:

- If you are installing IBM Spectrum Control on an AIX server, install sudo on the server. The default AIX distribution does not include sudo. To get the sudo installation package, go to <http://www.ibm.com/systems/power/software/aix/linux/toolbox/date.html>. Find **sudo-version** in the **Package** column, and click **RPM** to download the package.
- Ensure that the non-root user has sudo privileges for the following commands on the server:
 - **xauth** (Enables the non-root user to provide access to their X Window System display for the root user.)
 - **db2ln** (Enables the non-root user to create the links for the DB2 system files.)
 - **setup.bin** (Enables the non-root user to launch the IBM Spectrum Control installation program.)

You must enter the full path to the commands when you configure the sudo privileges. For example:

```
username ALL=(root) SETENV: /usr/bin/xauth,/opt/ibm/db2/V11.1/cfg/db2ln,/home/username/Downloads/IBMSC/SC/setup.bin
```

- If the sudo environment on the server uses the `secure_path` option, ensure that the following directories are included in the `secure_path` value for the non-root user who is installing IBM Spectrum Control:
 - `DB2_instance_owner_home_directory/sqlllib/bin` (Example: `/home/db2inst1/sqlllib/bin`)
 - `DB2_instance_owner_home_directory/sqlllib/adm` (Example: `/home/db2inst1/sqlllib/adm`)
 - `DB2_instance_owner_home_directory/sqlllib/misc` (Example: `/home/db2inst1/sqlllib/misc`)
- Ensure that the following requirements are met to enable the installation of IBM Spectrum Control by using the installation program:
 - The non-root user is able to use the X Window System on the target server and the X Window System `DISPLAY` environment variable is set correctly for the not-root user.

- The DISPLAY environment variable is preserved in the sudo environment.
- The root user has access to the X Window System display that is owned by the non-root user.

These display requirements do not apply if you install IBM Spectrum Control in silent mode.

- If you are installing IBM Spectrum Control on an AIX server, ensure that the ODMDIR environment variable is preserved in the sudo environment.

To install IBM Spectrum Control in a single-server environment, complete the following steps:

1. Log on to the target server as the root user or as a non-root user who has full sudo privileges.
2. If you logged on as a non-root user, run the following command in a command shell:


```
sudo DB2_installation_directory/cfg/db21n
```

For example:

```
sudo /opt/ibm/db2/V11.1/cfg/db21n
```

3. When you install IBM Spectrum Control, the TPCDB database is created in the location that you specify in the DB2 DFTDBPATH variable. To determine the current DFTDBPATH value, run the following command in a DB2 CLI window:


```
get dbm cfg
```

If you want to install this database in a location that is other than the default location:

- a. Run the following command in a DB2 CLI window:


```
update dbm cfg using DFTDBPATH path
```

where *path* is the new value for the DFTDBPATH variable.

- b. Run the **db2stop** and **db2start** commands to stop and restart DB2.
4. Use an extraction tool to extract the installation image files on the server. If you plan to install Jazz for Service Management and Tivoli Common Reporting, ensure that the installation files for IBM Spectrum Control are in one directory and the installation files for Jazz for Service Management and Tivoli Common Reporting are in another directory.
5. In a command shell, source the DB2 user profile db2profile for the DB2 instance owner. For example:


```
./home/db2inst1/sqllib/db2profile
```
6. In a command shell, change the directory to the location of the IBM Spectrum Control installation program setup.bin, and then enter the following command:

Root user

```
./setup.bin
```

Non-root user

```
sudo -E ./setup.bin
```

7. Review the Welcome page and make one of the following decisions:
 - If Jazz for Service Management is installed on your computer, the Welcome page displays a green check mark. Click **Next** to proceed to the next page in the IBM Spectrum Control installation program and install IBM Spectrum Control with reports.

- If Jazz for Service Management is not installed on your computer, the Welcome page displays an **Install Now** button.
 - If you do not want to install Jazz for Service Management on your computer, click **Next** to proceed to the next page in the IBM Spectrum Control installation program and install IBM Spectrum Control without reports.
8. If Jazz for Service Management is not installed, and you want to install it on your computer, you can install it now:
- a. On the Welcome page, click **Install Now**.
 - b. On the Install Jazz for Service Management page, complete the following steps:
 - 1) Provide the location where the Jazz for Service Management and Tivoli Common Reporting installation files were extracted.
For example, /temp/jazzinstall.
 - 2) If there is a port conflict, specify a new starting value for a 15-port range, and click the **Verify Port Availability** link to ensure that the port range is usable.
 - 3) Click **Install Now**.

The IBM Spectrum Control installation program pauses and the Jazz for Service Management launchpad starts.
 - c. When you exit the Jazz for Service Management launchpad, you are returned to the Install Jazz for Service Management page in the IBM Spectrum Control installation program. Click **OK**.
 - d. If the installation of Jazz for Service Management was successful, you are returned to the Welcome page, which now displays a green check mark. If the installation of Jazz for Service Management was not successful, a message is displayed, and you can click one of the following options:
 - **Install Now**, which starts the Jazz for Service Management launchpad again.
 - **Continue**, which returns you to the Welcome page.
 - e. On the Welcome page, click **Next**.
 - f. On the Choose Installation Location and Type page, select **Single Server**, and click **Next**.
9. If the installation of Jazz for Service Management was successful and you clicked **Next** on the Welcome page to install IBM Spectrum Control with reports, on the Configure Jazz for Service Management and Tivoli Common Reporting page, enter the following information, and click **OK**:
- The user name that is used to log on to the Jazz for Service Management WebSphere profile.
 - The password that is associated with the user name.
 - The path for the Jazz for Service Management installation directory.

Jazz for Service Management starts. After Jazz for Service Management starts, it might take some time before all components, including Tivoli Common Reporting, are running.

If the IBM Spectrum Control installation program is unable to communicate with Jazz for Service Management, you can select the **Install IBM Spectrum Control reports later** check box, click **OK**, and continue installing IBM Spectrum Control without reports. After you install IBM Spectrum Control

without reports, and resolve any problems with Jazz for Service Management, start the IBM Spectrum Control installation program again to install IBM Spectrum Control reports.

Important: If the installation of Jazz for Service Management was not successful and you clicked **Next** on the Welcome page to install IBM Spectrum Control without reports, the Configure Jazz for Service Management and Tivoli Common Reporting page does not display.

10. Follow the prompts in the installation program to install IBM Spectrum Control.

If an error occurred during the IBM Spectrum Control installation process, review the IBM Spectrum Control installation log files to find details about the error.

Verifying the installation

After you install IBM Spectrum Control, verify whether the installation was successful by starting the IBM Spectrum Control GUI.

Before you start IBM Spectrum Control, ensure that you are using a supported web browser. For a list of the supported web browsers, go to <http://www.ibm.com/support/docview.wss?uid=swg27047043#browser>.

1. On a server running the Windows operating system, click **Start > Programs > IBM Spectrum Control > Web-based GUI** to open a browser to the correct address. If you are not on a server running the Windows operating system, start a web browser and enter the following address in the address field:

`https://host_name:port/srm`

In the preceding address, specify the following values:

host_name

The IBM Spectrum Control server. You can specify the host name as an IP address or a Domain Name System (DNS) name.

port

The port number for IBM Spectrum Control. The default port number for connecting to IBM Spectrum Control by using the HTTPS protocol is 9569. However, this port number might be different for your site. For example, the port number might be different if the default port range was not accepted during installation. If the default port number does not work, ask your IBM Spectrum Control administrator for the correct port number.

You might be redirected from the address that you enter to another address and port that provides secure access using the HTTPS protocol. This page is the IBM Spectrum Control logon page.

2. From the IBM Spectrum Control logon page, type your user name and password and click **Log in**. The web-based IBM Spectrum Control GUI opens in the browser.
3. Optional: If you installed Jazz for Service Management, click **Cognos** and select a menu item to verify that the reporting tool is available.

For more methods of verifying the installation, go to the product documentation at

http://www.ibm.com/support/knowledgecenter/SS5R93_5.2.14/com.ibm.spectrum.sc.doc/fqz0_t_verifying_installation.html.

Reinstalling the software if a failure occurs

If an installation failure occurs, you do not have to uninstall components that were successfully installed. IBM Spectrum Control provides an option to partially, or fully, roll back the installation.

A full rollback uninstalls all the components (even if they were installed successfully), and a partial rollback uninstalls only the components that were not successfully installed. The partial rollback option helps you resolve the problems that are causing the installation failure. After you resolve the problem, you can install the remaining components. For example, if the correct libraries were not installed for the Linux operating system, and the installation stops. You can install the correct libraries and resume the installation.

If you install IBM Spectrum Control on the Windows operating system and select **Full Rollback**, you must restart the server after the rollback is complete.

If you originally selected a partial rollback, but decided to completely uninstall, you must run the uninstallation program before you reinstall IBM Spectrum Control.

The following table shows the results from a partial rollback. The components are listed in the order in which they were installed.

Table 4. Results from a partial rollback

If an installation failure occurs when you install this component...	Partial rollback results are...
IBM Spectrum Control common files and Java™ Runtime Environment	There is no partial rollback. The installation program completes a full rollback.
Database repository	The database repository is uninstalled.
Data server	The Data server is uninstalled.
WebSphere Application Server Liberty profile	WebSphere Application Server Liberty profile is uninstalled.
Alert server	The Alert server is uninstalled.
Device server	The Device server is uninstalled.
Cognos BI reports	Cognos Business Intelligence reports are uninstalled.
IBM Spectrum Control GUI	The IBM Spectrum Control GUI is uninstalled.
CLI	The command-line interface is uninstalled.
Storage Resource agent	The Storage Resource agent is uninstalled.

Taking the first steps after installation

After IBM Spectrum Control is installed, configure it to monitor the resources in your environment.

Access the IBM Spectrum Control GUI

To configure IBM Spectrum Control for your environment, access the GUI.

For more information about how to start the GUI, see [Opening IBM Spectrum Control GUIs and CLIs at http://www.ibm.com/support/knowledgecenter/SS5R93_5.2.14/com.ibm.spectrum.sc.doc/fqz0_t_windows_start_tpc_apps.html](http://www.ibm.com/support/knowledgecenter/SS5R93_5.2.14/com.ibm.spectrum.sc.doc/fqz0_t_windows_start_tpc_apps.html).

To set up IBM Spectrum Control for monitoring and managing resources, complete the following tasks:

Add resources for monitoring

You can add the following resources for monitoring:

- Storage systems and CIM agents
- Servers
- Hypervisors
- Switches
- Fabrics
- NetApp Filers

Configure the retention of data in the database repository

Determine how long that IBM Spectrum Control stores data about the resources that are being monitored.

(Optional) Configure the collection of data about the sizes of GPFS™ snapshots

By default, IBM Spectrum Control does not collect information about the size of GPFS snapshots. To view that information, you must enable IBM Spectrum Control to collect information about the size of GPFS snapshots.

For information about how to configure collection of snapshot size information, see [Collecting information about the sizes of GPFS™ snapshots](#).

Configure alert notifications for conditions that are detected on monitored resources

Determining when and how you are alerted to configuration and performance conditions within your storage environment is important to helping you maintain and administer storage resources. Many conditions can trigger alerts. You can set up IBM Spectrum Control so that it examines the data about your resources for the conditions that you specify.

Specify the users that can access the product and the functions that are available to them

Assign roles to groups of users to determine which functions are available in IBM Spectrum Control. When a user ID is authenticated to IBM Spectrum Control through the GUI, CLI, or APIs, membership in an operating system or LDAP group determines the authorization level of the user.

Deploy Storage Resource agents to set up data features

Deploy Storage Resource agents on servers to enable the data and policy-based management functions and to monitor the fabrics that are visible to the server.

Monitor and manage resources

Access the IBM Spectrum Control GUI to monitor and manage your storage, including the following tasks:


- Monitor the status of resources
- View capacity and asset information about resources
- Troubleshoot the performance of resources

- Set performance thresholds and alerts
- View the relationships between resources
- Optimize storage
- Configure for the cloud and storage provisioning
- Generate detailed reports about resources
- Access the vSphere Web Client extension to manage your virtual environment

Remove the IBM Spectrum Control installation directory from the antivirus scan

Scans that are conducted by antivirus software cause more I/O write operations on the IBM Spectrum Control and server disk drives. For example, the antivirus software can be set to scan any file, record, or process that is written to or read from. The scan includes logs, read/write operations for database records, and Java processes that are used by IBM Spectrum Control. The antivirus software performs write operations on the objects that it identifies with these scans. These additional operations affect product performance and are visible in the performance monitoring tools for the operating system on which the IBM Spectrum Control server is installed. For example, on the Windows operating system, the Reliability and Performance Monitor might show an unusually high number of active write operations for IBM Spectrum Control. To improve performance, update your antivirus software so that it excludes the IBM Spectrum Control installation directory from scans.

For more information about these tasks and how to manage and monitor your resources with IBM Spectrum Control, go to the product documentation at:

 http://www.ibm.com/support/knowledgecenter/SS5R93_5.2.14/com.ibm.spectrum.sc.doc/fqz0_c_wg_managing_resources.html.

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