IBM System Networking Switch Center

Version 7.1.2

User Guide

IBM System Networking Switch Center

Version 7.1.2

User Guide

Fifth Edition (May 2013)

Contents

Installing Switch Center 7.1

IBM System Networking Switch Center allows you to administer and maintain switches through a Web browser interface.

Installation Prerequisites

System Requirements

Switch Center (SNSC) is a Web application that you install on an AIX, Linux, or Windows system. The system must meet the following requirements:

Windows System Requirements

- Intel 32-bit or 64-bit system
- Windows 500 MB500 MBServer 2008 or Windows Server 2012
- Minimum 1 GB RAM
- Minimum 500 sMB free disk space during installation

Linux System Requirements

- Intel 32-bit system
- SUSE Linux Enterprise Server 10, SUSE Linux Server 11, Red Hat Enterprise Linux 6.1 for x86, or Red Hat Enterprise Linux 6.2 for x86
- Minimum 1 GB RAM
- Minimum 500 MB free disk space during installation

AIX System Requirements

- AIX® 6.1 on Power or AIX 7.1 on Power
- Minimum 1 GB RAM
- Minimum 500 MB free disk space during installation

Disk Storage Requirements

Consider the following when you plan disk space for SNSC:

- The total number of discovered devices.
- The number of SNSC active UI sessions with a page monitoring/viewing performance data
- The number of days that you plan to store switch performance data and events in the SNSC database

Typically, you need to plan for the following amount of disk space:

- 1K per device.
- 5 MB per hour for each SNSC UI session monitoring performance data at 10 seconds frequency
- 1 MB for storing 5000 events (traps and syslogs) received from a device

Browser Requirements

Switch Center is a Web application. You can log into SNSC from any system that supports the following browser versions:

- Microsoft Internet Explorer Version 8.*x* and 9.*x*
- Mozilla Firefox Version 10.*x* or higher

You must enable JavaScript on each browser.

Enabling JavaScript in Microsoft Internet Explorer

1 Open Microsoft Internet Explorer.

2 Click **Tools > Internet Options**.
3 Click **Security**.
4 Click the Internet icon.
5 Click **Custom Level**.
6 Scroll to **Scripting**.
7 Click **Enable Active Scripting**.
8 Click **OK**.

Enabling JavaScript in Mozilla Firefox

1 Open Mozilla Firefox.
2 Click **Tools > Options**.
3 Click **Content**.
4 Click **Enable JavaScript**.
5 Click **OK**.

Switch Configuration Requirements

Be sure that each switch that you plan to discover meets the following requirements.

- Ensure that SNMP access is enabled on the switch. See the *Command Reference* documentation for the switch for information about how to enable SNMP access.
- Ensure that the switch is physically connected to the network.
- Ensure that the switch is turned on and receiving power.
- Ensure that the switch has a correct IP address.
- Ensure that the switch is not blocking access from the client IP address.
- Be sure that you can successfully ping the switch.
- If you plan to use the automatic switch discovery feature, you must configure the switches in either SNMPv1 or SNMPv2c.
- If you plan to use the manual discovery feature, you can configure the switch in SNMPv1 or SNMPv2c or v3.

General Requirements

- You must locate a copy of the SNSC 7.1 installation image.
- You must have an ID with administrator privileges on the server where you plan to install SNSC 7.1.
- SNSC 7.1 uses the following ports:
  - Port 40080 for HTTP
  - Port 40443 for HTTPs
  - Port 40999 for RMI Service

Ensure that no applications use the ports, or configure SNSC to use different ports.

SNSC 7.1 also uses the following standard ports:

- Port 162 for SNMP trap reception
- Port 514 for syslog reception

Ensure that no other applications use the ports in the list.

FTP/SFTP/TFTP Server Requirements

SNSC requires but does not install an FTP, SFTP, or TFTP server. You must provide and configure an FTP, SFTP, or TFTP server to perform any of the image and configuration management functions (see “Configuring FTP/SFTP/TFTP Server Parameters” on page 114).

Installing Switch Center Manager 7.1

The instructions in this section explain how to install SNSC 7.1 on AIX, Linux,s or Windows systems.

Installing IBM System Networking Switch Center 7.1 on an AIX System

Note: The installers have the signature `7.1.x.x_install_aix.sh`. In the sfollowing procedures, <*installer*>`.sh` is used to indicate the signature being installed.

New Installation

1. Log in as root on the AIX system where you plan to install SNSC 7.1.
2. Download the SNSC 7.1 installer for AIX from the IBM Web site.
3. Run the installation script as follows:
   `#` <*installer*>**`.sh`**
4. The SNSC 7.1 application will be installed in the following directory:
   `/opt/ibm/SNSC`

The installer automatically starts SNSC services near the end of the installation process.

SNSC services are registered with the init process, which causes the services to start automatically when the AIX system starts.

Upgrading the Existing Switch Center

1. Log in as root on the AIX system that includes the Switch Center software you want to upgrade.
2. Download the SNSC 7.1 installer for AIX from the IBM Web site.
3. Run the installation script as follows:
   `#` <*installer*>**`.sh`**
4. The installation prompts you to confirm whether to proceed with the upgrade. Enter **yes** to upgrade SNSC to version 7.1.

The installer automatically starts SNSC services near the end of upgrade process.

Installing Switch Center 7.1 on a Linux System

Note: The installers have the signature `7.1.x.x_install_lin.sh`. In the following procedures, <*installer*>`.sh` is used to indicate the signature being installed.

New Installation

1. Log in as root on the Linux system where you plan to install SNSC 7.1.
2. Download the SNSC 7.1 installer for Linux from the IBM Web site.
3. Run the installation script as follows:
   `#` <*installer*>`.sh`
4. The SNSC 7.1 application will be installed in the following directory:
   `/opt/ibm/SNSC`

The installer automatically starts SNSC services near the end of the installation process.

SNSC services are registered with the init process, which causes the services to start automatically when the Linux system starts.

Upgrading the Existing Switch Center

1. Log in as root on the Linux system that includes the SNSC software you want to upgrade.
2. Download the SNSC 7.1 installer for Linux from the IBM Web site.
3. Run the installation script as follows:
   `#` <*installer*>`.sh`
4. The installation prompts you to confirm whether to proceed with the upgrade. Enter **yes** to upgrade SNSC to version 7.1.

The installer automatically starts SNSC services near the end of the upgrade process.

Installing Switch Center 7.1 on a Windows System

Note: The installers have the signature `7.1.x.x_install_win.exe`. In the following procedures, <*installer*>`.exe` is used to indicate the signature being installed.

New Installation

1. Log in as an administrator on the Windows system where you plan to install SNSC 7.1.
2. Download the SNSC 7.1 installer for Windows from the IBM site.
3. Double-click <*installer*>`.exe`

4 Click **Next**.

5 Select the typical installation option.

6 Click **Finish**.

The installer automatically starts SNSC services near the end of the installation process.

SNSC services are registered as Windows Services. Hence, they are automatically started when the Windows system starts up.

Upgrading the Existing Switch Center

1 Log in as an administrator on the Windows system that includes the SNSC software you want to upgrade.

2 Download the SNSC 7.1 installer for Windows from the IBM site.

3 Double-click <*installer*>.exe

4 Click **Next**.

5 The installation program prompts you to confirm whether to proceed with the upgrade. Click **yes** to upgrade SNSC to version 7.1.

6 Click **Finish**.

The installer automatically starts SNSC services near the end of the installation process.

Verifying Installation

Prerequisite: Before you can verify installation, you must ensure that the SNSC 7.1 services are started on the server where SNSC is installed.

- To check if the SNSC services are running on AIX or Linux, login as ‘root’ and run the following shell script:
  `# /opt/ibm/SNSC/bin/check.sh`
- To start SNSC services on AIX or Linux, login as 'root' and run the following shell script:
  `# /opt/ibm/SNSC/bin/startup.sh`
- To check if the SNSC services are running on Windows, login as Administrator and choose menu **Start > All Programs > IBM > Switch Center > Check Services.**
- To start the services on Windows, login as Administrator and choose menu **Start > All Programs > IBM > Switch Center > Start Services**.

In this procedure you test the local browser connection on the server and verify that the three default users created by the installation program can log in successfully. For information about the privileges available to the default users, see “Changing the Default Passwords” on page 42.

1. Launch a browser.
   a. If you are logged in to the server where you installed SNSC 7.1, enter `http://localhost:40080/snsc` or `https://localhost:40443/snsc`
   b. If you are logging in to SNSC 7.1 from another computer, enter `http://<hostname>:40080/snsc`, where <*hostname*> is the DNS name or IP address of the server where SNSC 7.1 is installed. If you enabled HTTPS, enter: `https://<hostname>:40443/snsc`
2. Enter admin/admin.
3. Verify that the home page displays.
4. Click **Logout**.
5. Enter oper/oper.
6. Verify that the home page displays.
7. Click **Logout**.
8. Enter user/user.
9. Verify that the home page displays.
10. Click **Logout**.
11. Make a note of the hostname where you installed SNSC. You will distribute the hostname to other administrators, operators and users.

Uninstalling IBM System Networking Switch Center 7.1

The instructions in this section explain how to uninstall SNSC 7.1 on an AIX, Linux, or Windows system.

- “Uninstalling IBM System Networking Switch Center 7.1 on AIX” on page 9
- “Uninstalling IBM System Networking Switch Center 7.1 on Linux” on page 9
- “Uninstalling IBM System Networking Switch Center 7.1 on Windows” on page 9

Uninstalling IBM System Networking Switch Center 7.1 on AIX

1. Log in as root on the system where you have installed SNSC 7.1.
2. Uninstall SNSC 7.1 by issuing the following command:
   `# /opt/ibm/SNSCManager/uninstall/uninstall.sh`

Uninstalling IBM System Networking Switch Center 7.1 on Linux

1. Log in as root on the system where you have installed SNSC 7.1.
2. Uninstall SNSC 7.1 by issuing the following command:
   `# /opt/ibm/SNSC/uninstall/uninstall.sh`

Uninstalling IBM System Networking Switch Center 7.1 on Windows

1. Log in as administrator on the system where you have installed SNSC 7.1.
2. Uninstall SNSC 7.1 by clicking **Start > Programs > IBM > Switch Center > Uninstall Switch Center.**
3. You can also uninstall SNSC 7.1 by clicking **Start > Settings > Control Panel > Add or Remove Programs .** Select **Switch Center – 7.x.x.x** and click **Change/Remove .**

Getting Started With Switch Center 7.1

Logging into Switch Center

Launch a browser and log in to Switch Center (SNSC). If you did not configure HTTP security on the Switch Center server, you might enter a URL that is similar to `http://<hostname>:40080/snsc`, where *hostname* is the domain name or IP address of the server where you installed Switch Center. If Switch Center is installed on a multi-homed system and is configured to use a specific IP address (see "Configuring IBM System Networking Switch Center Installed on a Multi-Homed System" on page 36), then *<hostname>* must be that IP address.

If you configured and enabled security on the Switch Center server and you want to log in with a secure HTTPS connection, you might enter a URL that is similar to `https://<hostname>:40443/snsc`

Enter `admin` in the User Name field and enter `admin` in the Password field the first time that you log in.

- "Configuring IBM System Networking Switch Center Installed on a Multi-Homed System" on page 36
- "First Steps" on page 38
- "How to Discover Switches" on page 47
- "About the Switch Center User Interface" on page 62
- "How to View Information About Switch Center" on page 129
- "How to View Information About Switch Center" on page 129
- "How to View Logs" on page 131
- "Advanced Configuration and Tuning" on page 149
- "How to Manually Set Device Discovery Date" on page 156

Configuring IBM System Networking Switch Center Installed on a Multi-Homed System

If you are planning to install Switch Center on a multi-homed system that has multiple IP addresses to connected networks, you may want Switch Center to use a particular IP address of that system for all operations.

You can configure Switch Center to use a particular IP address using the following steps:

On Linux System

1. Login to the system as a root user.
2. Stop SNSC Service by issuing the following command:
   `# /opt/ibm/snsc/bin/shutdown.sh`
3. Run configure_multihome.bat by issuing the following command:
   `# /opt/ibm/snsc/bin/configure_multihome.sh`
4. This script prompts you to continue and then lists all the IP addresses configured on that system.
5. Choose the IP address that you want Switch Center to use (this step also requires a confirmation).
6. Once the operation is complete, start SNSC Service by issuing the following command:
   `# /opt/ibm/snsc/bin/startup.sh`
7. Switch Center listens on the given IP address for UI requests and it also uses the IP address for administering the devices.

First Steps

The first time that you log in to Switch Center, complete the following steps. You must log in as an administrator to complete the steps.

1. Enable or Disable Root Users (see “Enabling and Disabling Root Users” on page 39)
2. Change the default admin, oper and user passwords (see “Changing the Default Passwords” on page 42).
3. Discover switches (see “How to Discover Switches” on page 47).

Enabling and Disabling Root Users

By default, Switch Center allows users who have administrator privileges to modify user passwords (Security Configuration) and change the authentication mechanism (Local or RADIUS or TACACS+ through Authentication Configuration). However, some deployments may want to enforce stricter access privileges for such operations. To address such deployments, Switch Center allows users to enable a special privileged ‘root’ user. The root user brings in the following changes:

- When you enable root user mode, Switch Center requires that you enter the root password before you can perform security and authentication configuration
- You cannot directly log in to Switch Center as root. You must login with the normal Admin/Oper/User credentials and then enter root password while performing Security and Authentication Configuration.
- The default root password is root.
- The root user is disabled by default.

Enabling the Root User

Use the following procedure to enable the Root User.

1. Stop SNSC Service:

   On a Linux system, issue the following command:
   `# /opt/ibm/snsc/bin/shutdown.sh`

2. Navigate to the following directory:
   <SNSC Installation Directory>`/conf/auth`

3. Open the following file in a text editor: `rootuser.properties`

4. Set `enabledRootUser` to `true`.

5. Start SNSC Service:

   On a Linux system, issue the following command:
   `# /opt/ibm/snsc/bin/startup.sh`

Disabling the Root User

Use the following procedure to disable the Root User.

1. Stop SNSC Service:

   On a Linux system, issue the following command:
   `# /opt/ibm/snsc/bin/shutdown.sh`

2. Navigate to the following directory:
   <SNSC Installation Directory>`/conf/auth`

3. Open the following file in a text editor: `rootuser.properties`

4. Set `EnableRootUser` to `false`.

5. Start SNSC Service:

   On a Linux system, issue the following command:
   `# /opt/ibm/snsc/bin/startup.sh`

Changing the Default Passwords

The Switch Center installation program creates three default users. The default user names and passwords are:

- admin/admin
- oper/oper
- user/user

If you are an administrator, you can log in to Switch Center as each user type and change the default passwords to help improve system security.

- **Administrator**—Only administrators can make permanent changes to the switch that persist after a switch is rebooted. Administrators can access switch functions to configure and troubleshoot problems on the switch.
- **Operator**—Operators have the same capabilities as listed for User plus the ability to reboot switches. Operators cannot change the switch configuration, such as uploading images and configuration files.
- **User**—User interaction with the switch is completely passive; nothing can be changed on the switch. Users can display information that has no security or privacy implications, such as switch statistics and current operational state information.

Changing the Default Administrator Password

1. Login to Switch Center.
2. Choose menu **Options > Security Configuration**.
3. Click **admin** in the **Modify Password For** list.
4. If Admin is mapped to root, enter the Admin password in the Admin Password field or enter the root password in the Root Password field.
5. Enter and re-enter the new administrator password.
6. Click **Modify**.
7. Test the new password:
   a. Click **Logout**.
   b. Enter admin in the User Name field.
   c. Enter the updated administrator password.
   d. Click **Login**.

Changing the Default Operator Password

1. Login to Switch Center.
2. Choose menu **Options > Security Configuration**.
3. Click **oper** in the **Modify Password For** list.
4. If Admin is mapped to root, enter the Admin password in the Admin Password field or enter the root password in the Root Password field.
5. Enter and re-enter the new password for operator.
6. Click **Modify**.
7. Test the new password:
   a. Click **Logout**.
   b. Enter **oper** in the User Name field.
   c. Enter the updated operator password.
   d. Click **Login**.

Changing the Default User Password

1. Login to Switch Center.
2. Choose menu **Options > Security Configuration.**
3. Click **user** in the **Modify Password For** list.
4. If **Admin** is mapped to root, enter the Admin password in the Admin Password field or enter the root password in Root Password field.
5. Enter the current administrator password in the Admin Password field.
6. Enter and re-enter the new user password.
7. Click **Modify**.
8. Test the new password:
   a. Click **Logout**.
   b. Enter user in the User Name field.
   c. Enter the updated user password.
   d. Click **Login**.

Changing the Default Root Password

Important: You can only perform this task if the Admin user is not mapped to the root user. See “Enabling and Disabling Root Users” on page 39.

1. Log in to Switch Center.
2. Choose menu **Options > Security Configuration**.
3. Click **root** in the **Modify Password For** list.
4. Enter the root password in the Root Password field.
5. Enter and re-enter the new root password.
6. Click **Modify**.

How to Discover Switches

Switch Center has two switch discovery options. You can automatically discover switches via IP address or subnet range. You can also use the manual discovery method to add individual switches.

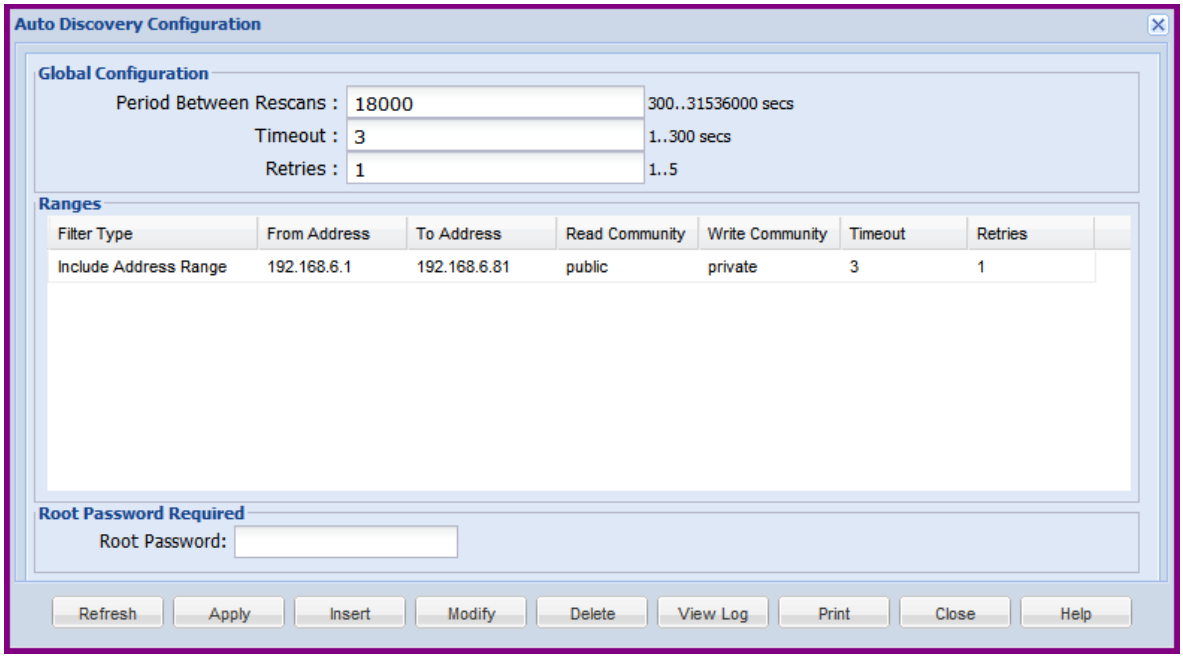
Domain and node configuration and administration is available only to the users login as an administrator (in case, if Root user is disabled) or to those users, who know ‘root’ password (in case, if Root user is enabled).

Using Auto Discovery

Use this switch discovery process to add more than one switch at a time to the Switch Center system. The Auto Discovery Configuration window displays the configuration parameters that Switch Center uses to find switches when you start the Auto Discovery operation. You must configure the switches in either SNMPv1 or SNMPv2 to use the auto-discovery feature.

Choose menu **Options > Discovery > Discovery Configuration** to open the Auto Discovery Configuration window (see Figure 1 on page 48).

Figure 1 Auto Discovery Configuration Window



You can perform the following auto discovery configuration tasks:

- Modify global configuration parameters
- Print global configuration and range summary values

- Modify or delete an existing configuration
- Insert a configuration

Table 1 Auto Discovery Configuration field descriptions

Field	Description
Period Between Rescan	The delay, in seconds, after which the Auto-Discovery process is activated to re-scan the configured IP address and subnet ranges. The default value is 18000 seconds (5 hours).
Timeout	The timeout value, in seconds. The timeout value controls how long SNSC waits for a response from a switch during auto-discovery. You can specify a timeout while configuring auto-discovery parameters. If you do not specify a timeout, SNSC uses the global timeout value. **Note**: This timeout value is applicable to both ICMP and SNMP requests sent during auto discovery.
Retries	The number of retries that you want SNSC to attempt during auto-discovery. You can specify the number of retries while configuring auto-discovery parameters. If you do not specify a retry interval, SNSC uses the global retries value. **Note**: The Retries is applicable only to SNMP requests sent during auto discovery. For ICMP, no retries are attempted.
Filter Type	Lists whether the entry is to be included (Include Address Range) or excluded (Exclude Address Range) while performing discovery operation.
From Address	Starting IP address of the range.
To Address	Ending IP address of the range.
Read Community	SNMP v1/v2c read-community password.
Write Community	SNMP v1/v2c write-community password.
Timeout	The timeout value, in seconds. The timeout value controls how long SNSC waits for a response from a switch during auto-discovery. You can specify a timeout while configuring auto-discovery parameters. If you do not specify a timeout, SNSC uses the global timeout value.

Table 1 Auto Discovery Configuration field descriptions (continued)

Field	Description
Retries	The number of retries that you want SNSC to attempt during auto-discovery. You can specify the number of retries while configuring auto-discovery parameters. If you do not specify a retry interval, SNSC uses the global retries value.
Root Password	Allows you to enter the root password. When the 'Root' user is enabled, the discovery configuration window can be launched by all users. However, the operations are allowed only when user enters the valid Root password. **Note**: This field is visible only when Root user is enabled.

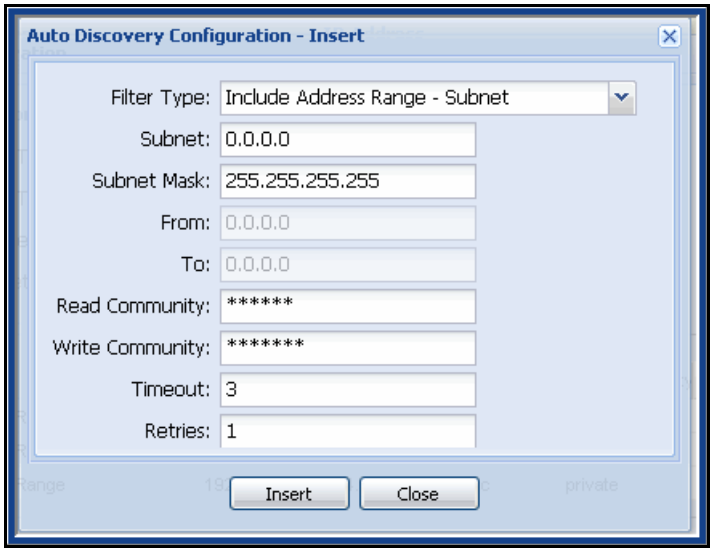
Auto Discovering Switches in a Subnet Range

You can configure Switch Center to automatically discover switches by searching for a specified subnet or subnet mask range.

1. Choose menu **Options > Discovery > Discovery Configuration**.
2. If Root user is enabled, enter the root password.
3. Click **Insert**.
4. Select **Include Address Range - Subnet** from the Filter Type list (see Figure 2 on page 51).
5. Enter the subnet information in the Subnet and Subnet Mask fields.
6. If required, change the default community strings entered in the Read Community and Write Community fields. The default strings are public and private respectively. These settings apply to SNMP version 1 or 2 access.
7. (Optional) Enter a subnet range to exclude from the Auto Discovery process.
   a. Click **Insert**. The Auto Discovery dialog box reopens.
   b. Select **Exclude Address Range - Subnet** from the Filter Type list.
   c. Enter the subnet information to exclude in the Subnet and Subnet Mask fields.
   d. Click **Insert**. The Exclude Address Range appears in the Auto Discovery Configuration window.
8. Click **Insert.**
9. Click **OK** to close the Auto Discovery information message. Switch Center begins to discover switches according to the values you defined for the subnets and masks.

Click **Close** to close the Auto Discovery Configuration window. Choose menu **Logs > Auto Discovery Log** to view the status of the Auto Discovery process.

Figure 2 Auto-Discovery Configuration by Subnet Range Window



See also:

- “Auto Discovering Switches by IP Address” on page 52
- “Using Manual Discovery” on page 54
- “Troubleshooting Switch Import and Discovery Problems” on page 61
- “How to View Logs” on page 131

Auto Discovering Switches by IP Address

You can only use this feature for switches that are configured in SNMPv1 or SNMPv2.

1. Choose menu **Options > Discovery > Discovery Configuration**.
2. If Root user is enabled, enter the root password.
3. Click **Insert**.
4. Select **Include Address Range - IP address range** from the Filter Type list (see Figure 3 on page 53).
5. Enter the IP address range in the *From* and *To* fields.
6. Type the appropriate community strings in the Read Community and Write Community fields. The default strings are public and private, respectively. These settings apply to SNMP version 1 or 2 access.
7. Click **Insert**.
8. (Optional) Enter an IP address range to exclude from the Auto Discovery process.
   a. Click **Insert**.
   b. Select **Exclude Address Range - IP Address Range** from the Filter Type list.
   c. Enter the IP address range to exclude in the *From* and *To* fields.
   d. Click **Insert**. The Exclude Address Range appears in the Auto Discovery Configuration window.
9. Click **Insert.**
10. Click **OK** to close the Auto Discovery information message.

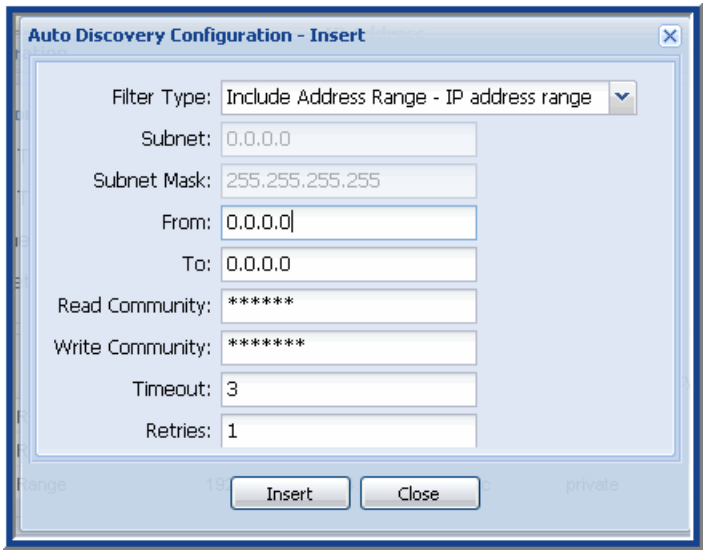
Switch Center begins to discover switches according to the values you defined for the IP address range.

Click **Close** to close the Auto Discovery Configuration window. Choose menu **Logs > Auto Discovery Log** to view the status of the Auto Discovery process.

After the Switch Center service starts, the Auto Discovery program attempts discovery on all of the ranges that you entered. This is the only time when all ranges are discovered.

After you enter a new range, that range, and only that range, is discovered.

Figure 3 Auto-discovery Configuration by IP Address Range Window

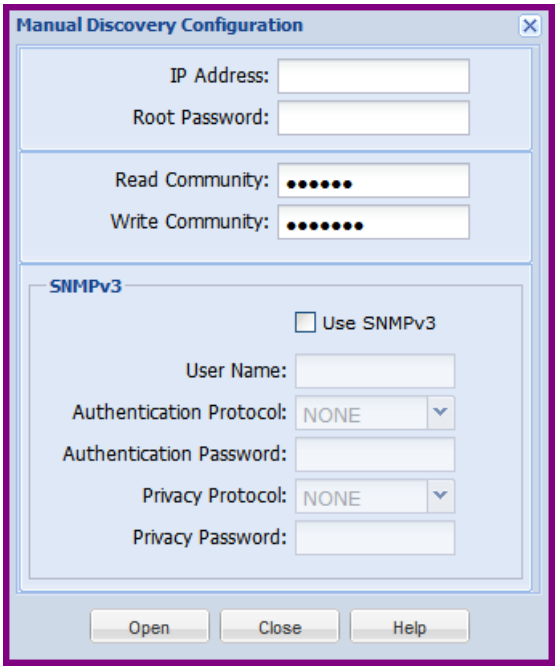


Using Manual Discovery

Use this switch discovery process to add one switch at a time to the Switch Center system.

1. Perform the manual discovery using one of the following steps:
   a. Click **Add Device** in Summary Page or Main Page. This operation results in adding the newly discovered device under the Root node in the navigation tree.
   b. In Main Page, right-click **Root** or a domain name in the left pane and click **Add Device**.
2. Type the IP address of the switch that you want to discover in the IP Address field (see Figure 4 on page 55).
3. If Root user is enabled, enter the root password in Root Password field (this field is not visible if Root user is disabled).
4. If you are discovering the switch configured with SNMPv1 or SNMPv2c:
   a. Enter the correct read and write community strings in Read Community and Write Community fields respectively.
   b. Click **Open**. Switch Center begins the switch discovery process.
5. To discover a switch that is configured as SNMPv3:
   a. Click **Use SNMPv3**.
   b. Enter the user name in User Name field.
   c. If Authentication is enabled on the switch (switch is configured in AuthNoPriv or AuthPriv), select the authentication protocol (**MD5** or **SHA1**) from Authentication Protocol list and enter the authentication password in Authentication Password field.
   d. If Privacy is enabled on the switch (switch is configured in AuthPriv), select **DES** in the Privacy Protocol list and enter the privacy password in the Privacy Password field.
   e. Click **Open**. Switch Center begins the switch discovery process.

Figure 4 Manual Discovery Configuration Window



Importing Device Lists from a CSV File

Switch Center's auto-discovery mechanism uses ICMP and SNMP to discover the devices. If you don't want to use auto-discovery or don't want to allow ICMP, then you can import the devices from a CSV (comma separated value) list. Importing the devices from the list saves precious time as you don't have to individually discover each devices using Manual Discovery option.

Note: The Import Device List window can import only devices that are Up and can be manually discovered by Switch Center.

The following sections show the Device List CSV file format along with some samples:

File Format:

```
<each row> ::= <Device Address>[,<SNMP Data>]

<Device Address> ::= <IP Address> | <IP Address Range>
<SNMP Data> ::= [<Timeout>], [<Retries>], <SNMP Params>
<SNMP Params> ::= <SNMP Version>, { <SNMP v1/v2c Data> | <SNMP v3 Data> }
<SNMP Version> ::= v1 | v2c | v3
<SNMP v1/v2c Data> ::= <Read Community>, <Write Community>
<Read Community> ::= <Plain Text> | <Encrypted Text>
<Write Community> ::= <Plain Text> | <Encrypted Text>
<SNMP v3 data> ::= <User Name>,[<Authentication Info>, <Privacy Info>]
<Authentication Info> ::= { MD5 | SHA }, <Password>
<Privacy Info> ::= DES, <Password>
<Password> ::= <Plain Text> | <Encrypted Text>
```

As we can see in the file format, the Device Address is mandatory and the SNMP Data information is optional. You can specify SNMP Data during import and this information is utilized as below:

- If the row contains SNMP data, then it is used instead of the data specified during import.
- If the row doesn't contain SNMP data, then the information supplied during import is used.

Note: You can only specify Community Strings and Passwords in plain-text. When Switch Center exports the device list, it saves the Community Strings and Passwords in encrypted form, which can only be deciphered by Switch Center.

File Samples:

No SNMP Data:

```
192.168.1.10
192.168.1.20-192.168.1.24
192.168.20.100
...
```

With SNMPv1/v2 Data with plain-text community strings:

```
192.168.1.10,3,1,v1,public,private
192.168.1.20-192.168.1.24,5,2,v2c,public1,private1
192.168.20.100,3,1,v1,public2,private2
...
```

With SNMPv3 Data with plain-text passwords:

```
192.168.1.10,3,1,v3,bnt1                                  # NO_AUTH_NO_PRIV
192.168.1.20-192.168.1.24,5,1,v3,bnt2,MD5,adminmd5          # AUTH_NO_PRIV
192.168.20.100,3,1,v3,bnt3,SHA,adminsha,DES,admindes        # AUTH_PRIV
```

Importing the Device List

Choose menu **Discovery > Import Device List** to open the Import Device List window (see Figure 5 on page 58). To import the device list, perform the following steps:

1 Click **Browse**... and select the CSV file containing the import list.

If Root user is enabled, enter the correct root password in Root Password field (this field is not visible, in case, if Root user is disabled).

If one or more rows in the CSV file doesn't contain SNMP Data, you can specify the information by checking Specify Other Information check box and following the additional steps given below:

a Select **SNMP Version**.

b Enter the timeout value in seconds in Timeout field.

c Enter the retries in Retries field.

d If SNMP v1 or v2c is selected, Enter appropriate community strings in Read Community and Write Community fields.

e If SNMP v3 is selected:

Enter user name in User Name field.

Select the authentication protocol from Authentication Protocol list.

If authentication protocol is not set to NONE, enter the authentication password in Authentication Password field.

Select the privacy protocol from Privacy Protocol list.

If privacy protocol is not set to NONE, enter the privacy password in Privacy Password field.

2 Click **Import** to import the list.

Figure 5 Import Device List Window

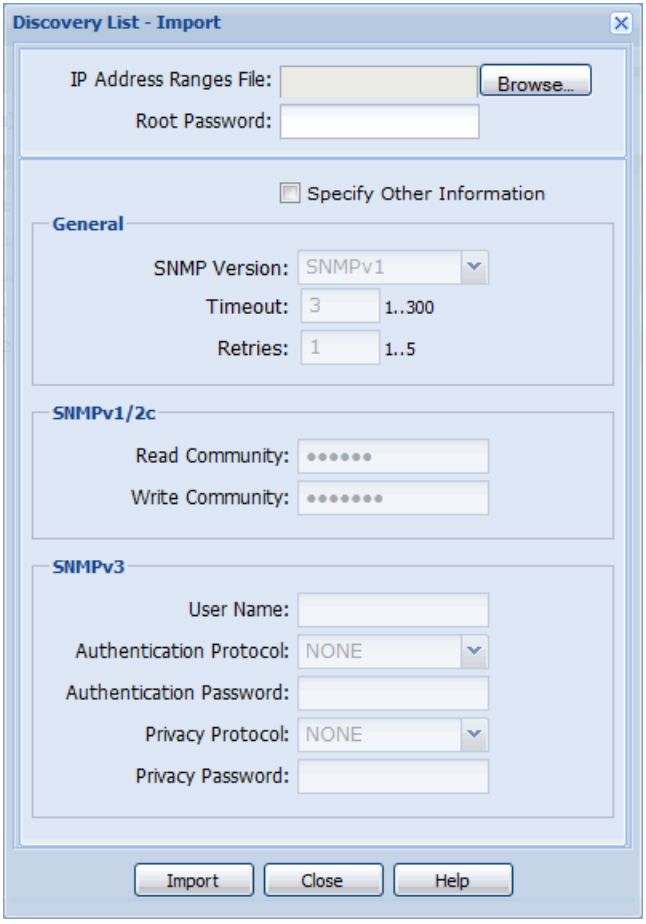


Table 2 Import Device List field descriptions

Field	Description
IP Address Ranges File	The CSV file containing the list of IP addresses of the switches to be discovered.
Root Password	The root password field. This field is visible if Root user is enabled.
Specify Other Information	Enables or disables SNMP specific fields.
SNMP Version	The SNMP version to use for those entries in CSV file that doesn't contain SNMP data.
Timeout	The timeout in seconds to use for those entries in CSV file that doesn't contain SNMP data. The range is 1 to 300 seconds.
Retries	The number of retries to use for those entries in CSV file that doesn't contain SNMP data. The range is 1 to 5.
Read Community	The Read Community to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when SNMPv1 or SNMPv2c is selected in SNMP Version.
Write Community	The Write Community to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when SNMPv1 or SNMPv2c is selected in SNMP Version.
User Name	The user name to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when SNMPv3 is selected in SNMP Version.
Authentication Protocol	The authentication protocol to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when SNMPv3 is selected in SNMP Version.
Authentication Password	The authentication password to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when Authentication Protocol is set to MD5 or SHA1.
Privacy Protocol	The privacy protocol to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only Authentication Protocol is set to MD5 or SHA1.
Privacy Password	The privacy password to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only Privacy Protocol is set to DES.

Exporting a Discovered List of Switches to a CSV File

You can export the discovered switches along with SNMP data to a CSV file. You can import the CSV file into Switch Center (see “Importing Device Lists from a CSV File” on page 56). To export the discovered switches:

1. Choose menu **Discovery > Export Device List**.
2. In the resulting dialog, select “Save File” option and click **OK**.
3. In the resulting file browser window, select the file, in which the contents to be saved.

Note 1: While exporting the data, Switch Center encrypts the Community Strings (in case of SNMPv1 or SNMPv2c) and Passwords (in case of SNMPv3). This can be decrypted only by Switch Center during import.

Note 2: If SNMP data is not completely available, the associated SNMP data field is blank.

Troubleshooting Switch Import and Discovery Problems

Check the following items if Switch Center displays an error message during switch discovery.

- In slower networks, increase the **Retry Count** and **Timeout** values on the Auto Discovery Configuration window. See Table 1 on page 49 for more information.
- In the **Open Device** window, ensure that the correct read and write community strings have been entered for SNMP version 1 and 2 connections.
- In the **Open Device** window, ensure that the correct SNMP version 3 information has been entered for SNMP version 3 connections.
- Ensure that the switch is physically connected to the network.
- Ensure that the switch is turned on and receiving power.
- Ensure that the switch has been assigned a correct IP address.
- Verify that you entered the correct IP address is being used in the **Open Device** window.
- Ensure that the problem does not exist because of an unrelated network misconfiguration.
- Ensure that SNMP access is enabled on the switch. See the *Command Reference* for the selected switch for information about how to enable SNMP access.
- Ensure that the switch is not blocking access from the client IP address.
- After the Switch Center service starts, auto discovery attempts to discover switches using all of the ranges you entered. This is the only time when all ranges are discovered.
- After you enter a new range, that range, and only that range, is discovered.

See also:

“How to Discover Switches” on page 47

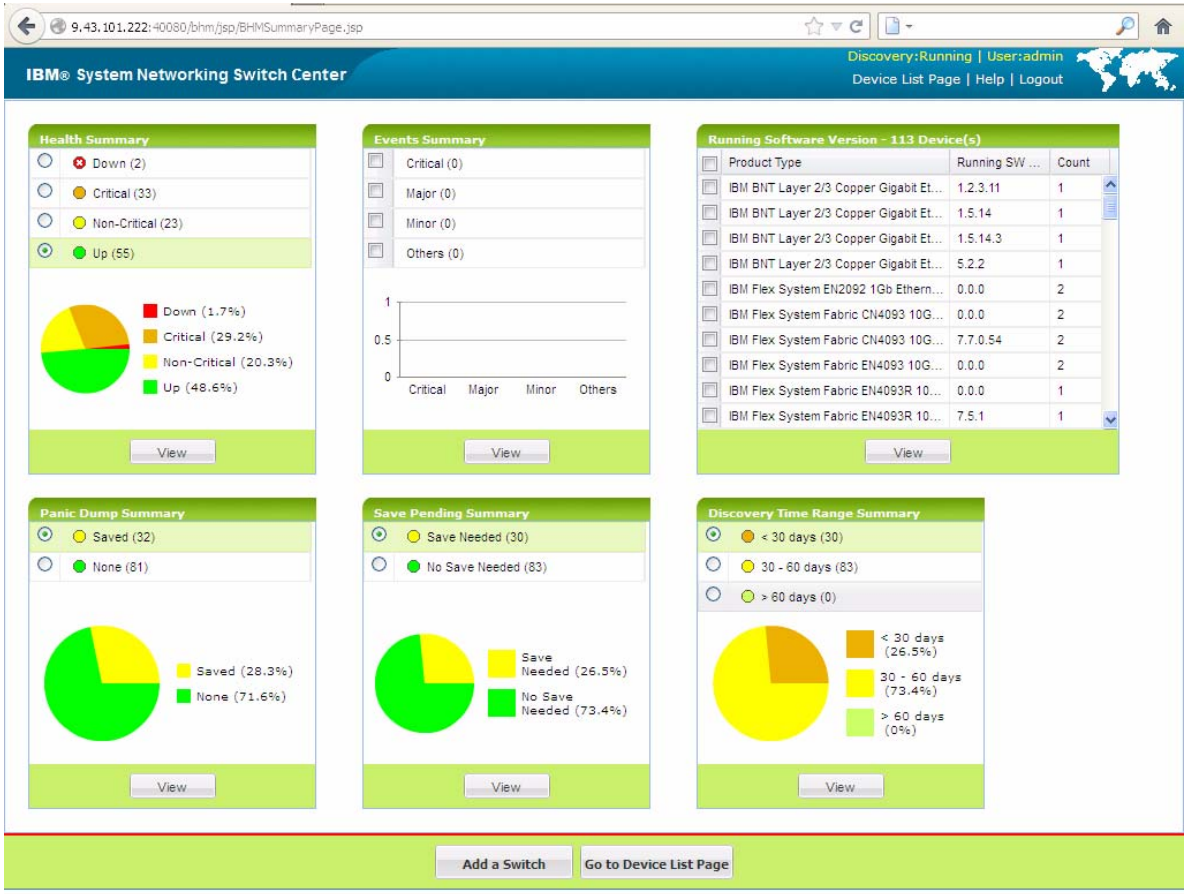
About the Switch Center User Interface

The following topics are discussed in this section:

About the Home Page

The Switch Center home page gives a quick summary of the devices discovered. It provides a graphical representation of Health Status, Panic Dump, Save Pending, Running Software Version and Device Discovery Timestamp, grouped into separate panels along with the device counts. (See Figure 6 on page 63). The information is updated periodically to give the actual counts and status of managed devices. It provides an option for the user to filter the devices available on the device list page based on the selection made here. Click **Add a Switch** to directly perform a manual discovery of switches for the SNSC system. The **Go to Device List Page** option lists all the devices discovered and does not perform any filtering.

Figure 6 Switch Center Manager Home Page Example



Health Status Summary Pane

The Health Status pane shows the individual count of devices discovered that are Down (red), Critical (orange), Non-Critical (yellow) and Up (green). It also provides a pie chart that indicates the percentages of Down/Critical/Non-Critical/Up devices (See Figure 7 on page 65). You can filter out the devices depending on the Health Status by selecting the appropriate choice and clicking View, which takes you to the Device list page (See Figure 8 on page 65).

You can clear the selection any time by clicking on top of the device list to reset the filter and see the complete list of devices discovered.

Figure 7 Health Summary Pane

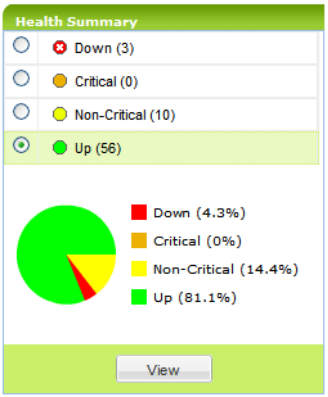
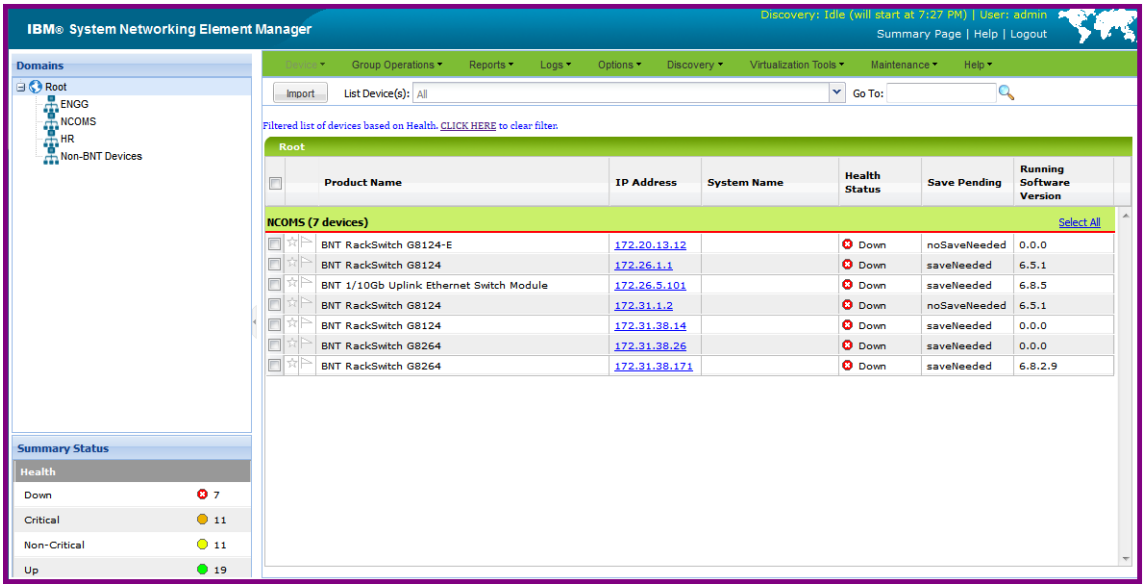


Figure 8 Filtered Device List Based on Health Status



Note: Switch Center shows Critical and Non-Critical status for RackSwitches and IBM BladeCenter switches.

For RackSwitches, Switch Center directly gets the status information that indicates one or more of the following conditions:

- Critical:
  - One or more temperature sensors are in the failure range (e.g. >=100 C).

    - Fan Modules/Fans are not working properly, as follows:
        - BNT RackSwitch G8000, BNT RackSwitch G8100, BNT RackSwitch G8124/G8124-E: One or more fans are running at less than or equal to 500 RPM
        - BNT RackSwitch G8052: Fewer than 3 Fan Modules are in good state. A Fan Module is considered good if fans in that module are running at more than 500 RPM
        - BNT RackSwitch G8264: Fewer than 4 Fan Modules are in good state. A Fan Module is considered good if fans in that module are running at more than 500 RPM
    - One power supply is off.
- Non-Critical:
    - One or more temperature sensors are in the warning range (e.g. >=85 and < 100 C).
    - A panic dump exists in flash.

For IBM BladeCenter switches, Switch Center assigns the status by combining the status of the following discreet variables on those switches:

- Critical:
    - One or more temperature sensors are in the failure range.
- Non-Critical:
    - One or more temperature sensors are in the warning range.
    - A panic dump exists in flash.

Panic Dump Summary Pane

The Panic Dump Summary shows the count of discovered devices based on their panic-dump status, as follows:

- Devices that have a panic dump saved (yellow)
- Devices with no panic dump (green)

It also provides a pie chart that indicates the panic-dump status of all devices. Click **View** to filter devices based on the status of their panic dumps.

Save Pending Summary Pane

The Save Pending Summary shows the count of discovered devices based on their save status, as follows:

- Devices that have configuration saved (No Save Needed)
- Devices that do not have configuration (Save Needed)

It also provides a pie chart that indicates the saved status of all devices. Click **View** to filter devices based on their saved status.

Discovery Time Range Summary Pane

The Discovery Time Range Summary shows the count of discovered devices based on duration of discovery (the number of days elapsed since their discovery in Switch Center). This Summary Pane also provides a pie chart that indicates the number of devices discovered in the given time range. Click **View** to filter devices based on their discovery date.

Running Software Version Summary Pane

The Running Software Version Summary categorizes the devices discovered by product type and running software version. You can filter the devices by product type and version by selecting one or more product types and clicking **View**.

About the Device List Page

The Switch Center Device List page consists of three framed windows with menu and filter bars. The left-hand frame has two sub-panes – Domains and Summary Status. The right-hand or center frame consists of a menu bar, filter bar, and the Device List pane.

The Domains Pane

The Domains pane displays the list of domains. By default, Switch Center is shipped with two domains:

- Root
- Non-BNT Devices

When the discovery information is imported from Tivoli Network Manager, the domains are created under Root and these domains maps to the Network Domains in Tivoli Network Manager.

The newly discovered devices imported from a CSV file are placed under Root domain.

The Non-BNT Devices domain serves as a place holder for listing non supported devices.

The Summary Status Pane

The Summary Status window displays information about the health status for all discovered switches.. The data in the Summary Status window is refreshed automatically.

The Summary Status Health column displays the count of discovered devices that are Up, Down, Critical and Non-Critical. If Switch Center is able to send and receive SNMP messages to a device, the switch health is set as Up or else, the status is set as Down. For RackSwitches and IBM BladeCenter specific switches, Switch Center can show additional status information (Critical and Non-Critical).

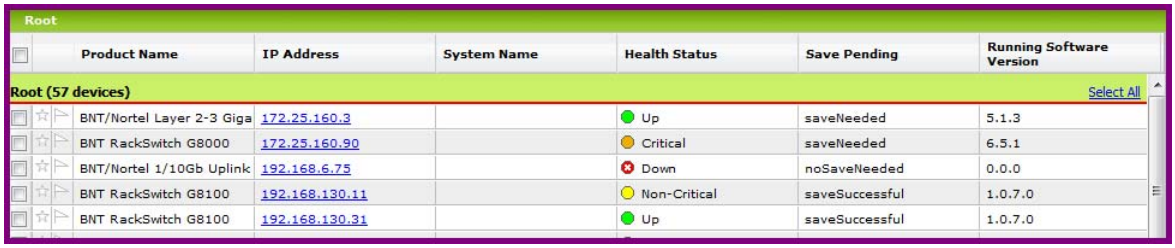
The Device List Pane

The Device List content pane displays the list of all the devices discovered in Switch Center.

By default, the device list shows Product Name along with Favorite Icon and Notes flag, IP Address, System Name, Health Status, Save Pending and Running Software Version fields, while other fields such as Config For Next Reset, Discovery Date, MAC address, Location, Rack, Chassis, Module Bay, and Domain are hidden. You can enable Switch Center to either show or hide any column by clicking the right corner of any column, then selecting Columns and then checking or clearing one or more columns to show or hide them.

The Health Status column shows the status as a combination of colored icon with appropriate text for better readability (see Figure 9 on page 74).

Figure 9 Device List Showing Health Status

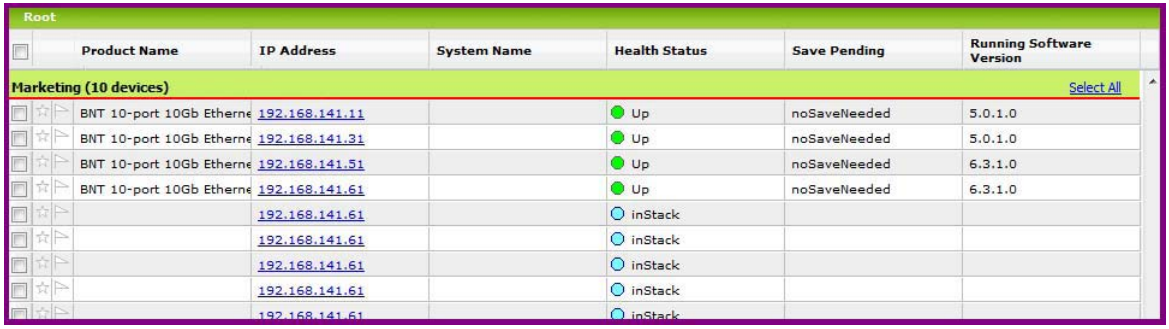


Stacked Switches

For easy recognition, the Device List displays stacked switches in a slightly different manner (see Figure 10 on page 75):

- The switches in the stack are grouped together in the device list with the same IP Address.
- The master switch shows the Product Name, whereas the other switches in the stack do not show this field. This distinction makes it easier to recognize the stack of switches.
- The health status of stacked switches (except the master switch) will show as either `inStack` or detached.

Figure 10 Device List Showing Stacked Switches



Device List Page – Menu Bar

The menu bar of the Device List page provides the global commands that can be invoked either on an individual device or a group of devices. The following table describes the main menu bar items.

Table 3 Device List Page — Menu Bar Items

Menu	Description
Device	This menu item is enabled only for individual device selection and provides commands for opening Monitor, Configure pages and for performing actions.
Group Operations	Provides commands associated with firmware and configuration deployment, reports and actions that can be invoked on an individual or a group of devices.
Reports	Displays various reports such as Events, Syslog, Alerts, Switch Version Report, VMready VM report associated with all the discovered devices.
Logs	Displays various log windows showing the messages logged by SNSC.
Options	Provides various windows to assist configuring SNSC properties.
Discovery	Provides various windows to assist Device Import operations from Tivoli Network Manager and CSV file.
Virtualization Tools	Provides the options for launching virtualization tools: VSI DB Console and VMready Across the Datacenter wizard.
Maintenance	Provides commands associated with SNSC maintenance operations such as Purging DB configuration, Log file configuration, Backing up critical data and creating Tech Support Dump.
Help	Provides commands for accessing online help and support options for SNSC.

Device Menu

The following table describes the Device List page **Device** menu commands:

Table 4 Device List Page — Device Menu

Sub-menu	Description
Monitor	This menu launches **Device Console** showing Monitor frame. The Monitor frame consists of multiple panels displaying various switch data and statistical information.
Configure	This menu is enabled only for few supported devices. When activated, it shows Device Console's configuration frame enabling privileged user to set various device parameters.
Sync Config	Opens the **Sync Config** frame that can be used for synchronizing switch configuration such as VLAN and Ports for other switches.
Set Discovery Date	Opens the Set Discovery Date dialog that can be used for manually setting the discovery date for the selected device/switch.
Change SNMP Parameters	Opens the Modify Discovery Parameters dialog that can be used for changing the SNMP parameters used by SNSC for managing the selected device/switch.
Actions	Provides a set of actions commands that can be invoked on the selected device. The following lists various commands: • *Apply* - Applies any changes that you have made to the switch configuration. • *Save* - Saves the current configuration to the flash memory. • *Diff Config* - Opens a window to display any pending configuration changes. • *Diff Flash* - Opens a window to display any pending configuration changes and the affected configuration stored in flash memory on the switch. • *Config Dump* - Opens a window to display a dump of the current switch configuration. • *Syslog Dump* – Opens a window to display the syslogs available on the switch. • *Revert* - Reverts the switch to the current active configuration. This command is available if you did not apply the new configuration settings. • *Revert Apply* - Reverts the switch to the current saved configuration. This is available if you applied but did not save the new configuration settings. • *Reboot Switch* - Reboots the switch by reloads and saving the current RAM memory. • *Delete* – Deletes the switch entry from SNSC device list.
Launch	Provides the commands for launching Browser Based Interface (Web) and SSH/Telnet application (Console).

Group Operations Menu

The following table describes the Device List page **Group Operations** menu commands:

Table 5 Device List Page — Group Operations Menu

Sub-menu	Description
CLI Push	Opens a text window enabling the user to type-in CLI commands that can be invoked on the selected switch(es).
Collect Data From Device	Refreshes the device data by retrieving the information from the selected switch(es).
Switch Version Report	Displays the switch version report associated with the selected switch(es).
Transceiver Information Report	Displays the transceiver information report associated with the selected switch(es). **Note**: Transceiver Information is available only for those switches supporting 10G ports.
VM Data Center Report	Displays the VM Data Center report associated with VMready switches in the selected list of switch(es).
Set Discovery Date	Opens the Set Discovery Date dialog that can be used for manually setting the discovery date for the selected device(s)/switch(es).
Deployment	Provides a set of commands for performing various operations related to firmware and configuration deployment on the selected switch(es): • *Image Upgrade* – Uploads the selected firmware from the given FTP/SFTP/TFTP server on to the selected switch(es). • *Image Backup* – Backs up the firmware from the selected switch(es) and stores them on the given FTP/SFTP/TFTP server. • *Configuration Upgrade* – Uploads the selected configuration file from the given FTP/SFTP/TFTP server on to the selected switch(es). • *Configuration Backup* - Backs up the configuration from the selected switch(es) and stores them on the given FTP/SFTP/TFTP server. • *Panic Dump* – Downloads the panic dump from the selected switch(es) and stores them on the given FTP/SFTP/TFTP server. • *Tech Support Dump* – Generates the tech support dump on the selected switch(es) and stores them on the given FTP/SFTP/TFTP server. • *Scheduled Jobs* – Displays the window for viewing and cancelling the scheduled jobs.

Table 5 Device List Page — Group Operations Menu

Sub-menu	Description
Group Actions	Provides a set of actions commands that can be invoked on the selected switch(es). The following lists various commands: • *Apply* - Applies any changes that you have made to the switch configuration of the selected switch(es). • *Save* - Saves the current configuration to the flash memory on the selected switch(es). • *Reboot Switch* - Reboots the selected switch(es). • *Delete* – Deletes the selected switch entry/entries from SNSC device list.
Notes	Provides a set of commands associated with adding or removing notes as given below: • Add – Opens up Notes dialog that can be used for adding notes for the selected device(s)/switch(es). • Remove – Removes the notes, if present, for the selected device(s)/ switch(es).

Reports Menu

The following table describes the Device List page **Reports** menu commands:

Table 6 Device List Page — Reports Menu

Sub-menu	Description
SNSC Alerts	Displays the list of alerts generated by SNSC.
Switch Version Report	Displays the switch version report of the switches.
Transceiver Information Report	Displays the transceiver information report associated with those switches supporting 10G ports.
VM Data Center Report	Displays the VM Data Center report associated with VMready switches.
VMready VM Report	Provides the following VM reports: • *Port Groups* – Port Groups memberships that are configured on the discovered VMready switches. • *VM Groups* – Virtual Machine Groups memberships that are configured on the discovered VMready switches.

Logs Menu

The following table describes the Device List page **Logs** menu commands:

Table 7 Device List Page — Logs Menu

Sub-menu	Description
Discovery Import Log	Opens the log window showing the messages logged while importing the discovery information from Tivoli Network Manager.
Concurrent Backup Log	Opens the log window showing the messages logged by while performing firmware or configuration backup operation.
Concurrent Download Log	Opens the log window showing the messages logged by while performing firmware or configuration download operation.
Concurrent Reset Log	Opens the log window showing the messages logged by while performing switch reboot (reset) operation.
Scheduled Backup Log	Opens the log window showing the messages logged by while performing firmware or configuration backup operation at a scheduled time.
Scheduled Download Log	Opens the log window showing the messages logged by while performing firmware or configuration download operation at a scheduled time.
Scheduled Reset Log	Opens the log window showing the messages logged by while performing switch reboot (reset) operation at a scheduled time.
CLI Push Log	Opens the log window showing the messages logged while performing CLI push operation.
DB Log	Opens the log window showing the messages logged while performing Database operation.
CMI Log	Opens the log window showing the messages logged while communicating with the switches.
VSI DB RESTful Access Log	Opens the log window showing the messages logged by while processing access to VSI DB from REST clients.
Authentication Log	Opens the log window showing the messages logged while performing user authentication.
Sync Config Log	Opens the log window showing the messages logged while performing sync config operation.
VM Server Log	Opens the log window showing the messages logged while communicating with Virtual Machine Management Server.
VMready Deployment	Contains the following logs: • VMready Across Datacenter **- VMAP**: Displays VMAPs deployed to the switches from the VMready Across the Datacenter Wizard. **- VMready**: Displays VMready configuration deployment to the various switches from the VMready Across the Datacenter Wizard.

Options Menu

The following table describes the Device List page **Options** menu commands:

Table 8 Device List Page — Options Menu

Sub-menu	Description
General Properties	Opens up the properties window where you can set the values such as Concurrent Limit, Session Timeout and Temperature format.
Refresh Configuration	Opens the properties window where you can set the refresh interval.
Security Configuration	Opens the properties window where you can set the user password.
Data Collection Configuration	Opens the properties window where you can set the polling interval for health check and performance statistics collector.
Authentication Configuration	Opens the properties window where you can set the authentication mechanism and the associated properties.
FTP/SFTP/TFTP Configuration	Opens the properties window where you can set the IP address and login credentials (FTP only) to use for accessing FTP, TFTP, or SFTP server.
Discovery Time Range Configuration	Opens the Discovery Time Range Configuration window, which allows you to set the time range in number of days.
VM Manager Server Connector	*Configuration* – Opens up the configuration window where you can manage VM Manager Server credentials
Dial Home	Provides Commands for configuring Dial Home: • *Email Configuration* – Opens a configuration window where you can configure Mail Server parameters and add the list of email addresses for Dial Home operation. • *Traps Configuration* – Opens a configuration window where you can add or remove a list of SNMP traps for Dial Home operation. • *Health Status Configuration* – Opens a configuration window where you can add or remove a list of health status messages for Dial Home operation.

Discovery Menu

The following table describes the Device List page Discovery menu commands:

Table 9 Device List Page — Discovery Menu

Sub-menu	Description
Discovery Configuration	Opens the discovery configuration window, where you can view/edit the following parameters: • **Period Between Rescans** – The delay, in seconds, after which SNSC's automatic device import process is activated to import the discovery data from Tivoli Network Manager. • **Timeout** – The timeout value, in seconds, used while performing the data gathering operation during device discovery. • **Retries** – The number of retries used while performing the data gathering operation during device discovery.
Import Device List	Imports the devices from a CSV file and starts discovering them.
Export Device List	Allows you to export the discovered devices to a CSV file.

Virtualization Tools Menu

The following table describes the Device List page Virtualization Tools menu commands:

Table 10 Device List Page — Virtualization Tools Menu

Sub-menu	Description
VSI DB Console	Opens the VSI Console window for configuring ACL and VSI types, so that SNSC can be used as the centralized VSI DB manager.
VMready Across Datacenter	Opens the wizard for configuring VMready features across all supported switches.

Maintenance Menu

The following table describes the Device List page Maintenance menu commands:

Table 11 Device List Page — Maintenance Menu

Sub-menu	Description
DB Data Purge Configuration	Opens the properties window where you can set the database purge interval.
Log File Configuration	Opens the properties window where you can set the log file size and backup count.
SNSC Support Dump	Opens the support dump dialog that can be used for saving tech support dump data on the browser system for debugging.
Data Backup	Provides commands for taking the backup of SNSC's critical data. • Take Data Backup – Backs up SNSC's critical data and stores the backup data in the configured directory. • Set Data Backup Directory – Opens the window where you can set the directory on SNSC server to use for keeping the backup data.

Help Menu

The following table describes the Device List page **Help** menu commands:

Table 12 Device List Page — Help Menu

Sub-menu	Description
Help Contents	Opens the context specific online Help page.
IBM Systems Networking	Takes you to IBM Systems Networking page in a separate window.
About IBM System Networking Switch Center	Opens a dialog box that shows the version, license details and the list of supported switches.

About the Device Console Page

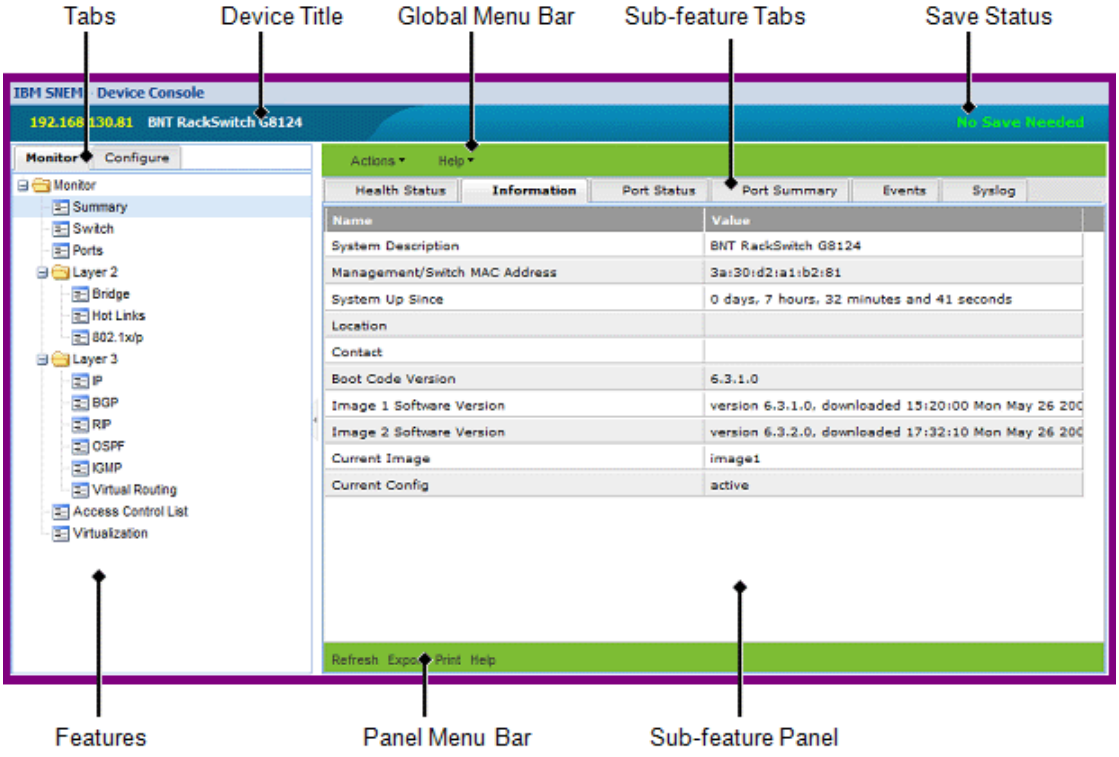
The Device Console page (see Figure 11 on page 88) enables you to view various monitoring pages associated with device parameters and statistics data. This page also allows you to configure device parameters for which configuration management is supported.

You can open the device console page using one of the below approaches:

- In the Device List content pane, click the IP Address hyper-link.
- Enter the IP Address of the device in "Go To" field and click **Search** icon (Magnifying Glass).
- Select the switch and click either menu **Devices > Monitor** or **Devices > Configure**.

The Device Console page consists of three framed windows with menu bars. The top frame shows the device information. The left-hand frame shows the feature tabs (Monitor and Configure) and a tree listing the supported features. The right-hand frame consists of menu bar, sub-feature tabs and the content pane showing the data associated with the selected tab.

Figure 11 IBM System Networking Switch Center – Device Console Page



Device Console - Top Frame

On the left-hand side, the top frame shows the selected switch information consisting of IP address, switch type. On the right-hand side, it shows the save pending status indicating whether configuration save is needed for that switch or not.

Device Console – Feature (or Left) Frame

The feature (or left) frame displays the tabs corresponding to Monitor and Configure options. The Configure tab is enabled only for those switches for which configuration management is supported.

When you select a tab, the corresponding features listed in a tree hierarchy. When you select a node, the right hand content pane is refreshed to display the tabs associated with the selected feature (node).

Device Console – Content (or Right) Frame

The content (or right) frame displays the global menu bar, tabs and panel menu bar corresponding to feature selected in Feature (or Right) frame.

Device Console Page – Menu Bar

The menu bar of the Device Console page provides the global commands that can be invoked for the selected switch irrespective of the selected tab. The following table describes the Main Menu Bar items.

Table 13 Device Console Page — Menu Bar Items

Menu	Description
Actions	Provides a set of actions commands that can be invoked on the selected switch.
Help	Provides commands for accessing online help and support options for SNSC.

Actions Menu

The following table describes the Device Console page **Actions** menu commands:

Table 14 Device Console Page — Actions Menu

Sub-menu	Description
Apply	Applies any changes that you have made to the switch configuration.
Save	Saves the current configuration to the flash memory.
Diff Config	Opens a window to display any pending configuration changes.
Diff Flash	Opens a window to display any pending configuration changes and the affected configuration stored in flash memory on the switch.
Config Dump	Opens a window to display a dump of the current switch configuration.
Syslog Dump	Opens a window to display the syslogs available on the switch.
Revert	Reverts the switch to the current active configuration. This command is available if you did not apply the new configuration settings.
Revert Apply	Reverts the switch to the current saved configuration. This is available if you applied but did not save the new configuration settings.
Reboot Switch	Reboots the switch by reloads and saving the current RAM memory.
Exit	Closes the Device Console window.

Help Menu

The following table describes the Device Console **Help** menu commands:

Table 15 Device Console — Help Menu

Sub-menu	Description
Help Contents	Opens the context specific online Help page.
IBM Systems Networking	Takes you to IBM Systems Networking page in a separate window.
About IBM System Networking Switch Center	Opens a dialog box that shows the version, license details and the list of supported switches.

Device Console Page – Panel Menu Bar

The panel menu bar is specific to the panel shown in the content pane. Though some of them are disabled for some panels, but the associated action remains the same across panels.

Table 16 Device Console — Panel Menu Bar Items

Menu	Description
Submit	Submits the configuration changes you have made to the switch parameters. This menu is available only for configuration panels.
Apply	Applies any changes that you have made to the switch configuration. This menu is available only for configuration panels.
Refresh	Refreshes the panel contents.
Export	Export the data displayed in the panel to a CSV file.
Print	Opens the Print dialog so that you can print the current page.
Help	Launches the context-sensitive help page.

Device List – Go To search option

The Device List page includes a *Go To* field that allows you to list the device based on IP address or System Name string. You can perform this operation by specifying the IP address or part/full system name string in the *Go To* field and click the **Search** icon (Magnifying Glass).

If you enter an IP address or System Name in *Go To* field and if a device with that IP address is discovered, the corresponding Device Console page launches upon the completion of search operation.

If you specify part of the System Name string and it matches multiple devices (for example, there are 3 switches configured with system names “Core Switch1”, “Router Switch2”, “Gateway Switch3” and you specify the search string as “Switch”), then all those matched devices are provided in a filtered list (similar to the List Device(s) drop-down function).

Note: SNSC-C provides an option at the top of the filtered list to clear the filter.

Device List – Favorite Marking and Adding Notes

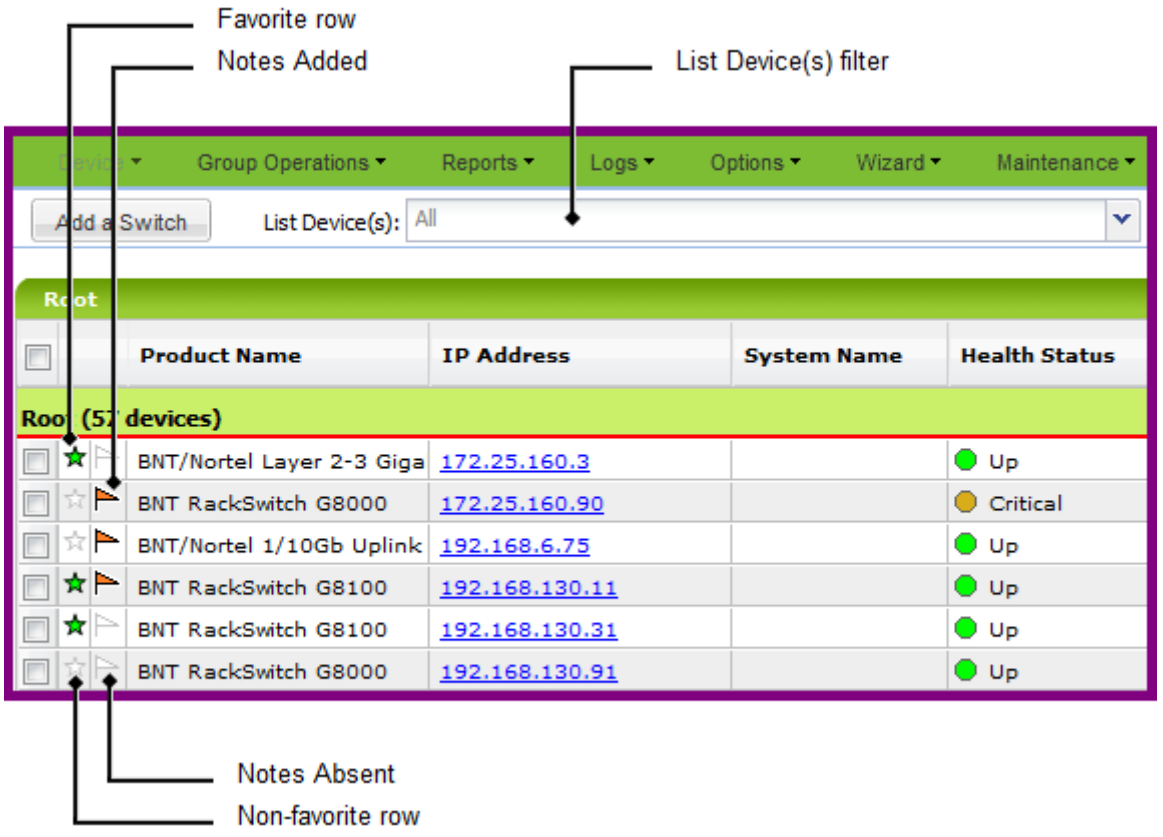
The Device List page enables you to set any row as a Favorite row so that you can list only those devices using List Device(s) filter (see Figure 12 on page 97). If you have logged in as an Administrator, you can also add notes for any discovered device to indicate any changes such as firmware upgrade, config upgrade occurring at a later date/time so that other users can see that message.

Favorite Marking

The Favorite marking works in toggle mode – clicking a favorite row removes the favorite marking and likewise, clicking a non-favorite row makes it a favorite one. Favorite row is marked with green star icon, where as the non-favorite row displays hollow gray star icon (see Figure 11 on page 88).

Note: Favorite markings are user-specific and the feature is available to all types of users.

Figure 12 Device List Showing Favorites and Notes Icons



Adding Notes

If you have logged into Switch Center as an Administrator, you can add Notes for an individual device/switch, using the following steps:

1. Click the Notes icon (see Figure 12 on page 97)to open the Notes dialog.
2. Type-in the text you want to add.
3. Click **OK**.

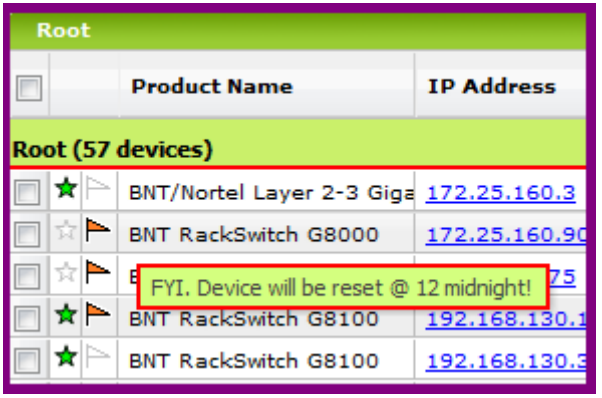
You can also add Notes to group of rows, using the following steps:

1. In Device List table, select one or more rows.
2. Choose menu **Group Operations > Notes > Add** to bring up Notes dialog.
3. Type-in the text you want to add.
4. Click **OK**.

Note: When Notes is added, the Notes icon changes to Notes Added icon (orange flag).

You can see the added Notes as a tool tip by moving the mouse on Notes Added icon (see Figure 13 on page 98).

Figure 13 Display of Notes as a Tool Tip



Removing Notes

You can remove the Notes through Administrator login using the following steps:

1. Click the **Notes Added** icon (see Figure 13 on page 98) to open the Notes dialog.
2. Click **Remove**.

Notes from group of rows also can be removed using the following steps:

1. In Device List table, select one or more rows.
2. Choose menu **Group Operations > Notes > Remove**.

Changing IBM System Networking Switch Center Configuration

You can change many of the parameters that influence Switch Center's behavior. You can find the corresponding commands under the **Options** and **Maintenance** menus. The following sub sections list those parameters that can be configured:

Changing the Default General Properties

The General Properties parameters control the number of servers on which you can currently perform group operations. See Figure 14 on page 101 for an example of the General Properties window.

1. Choose menu **Options > General Properties**.
2. Change the Concurrent Limit setting. The value range is 10 to 50.
3. Change whether to display the temperature in Celsius or Fahrenheit.
4. Click **Save**. The changes take effect immediately.

Figure 14 General Properties Window

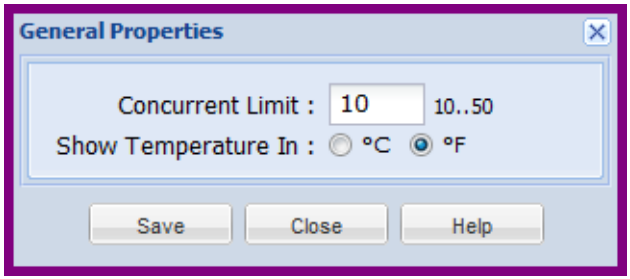


Table 17 General Properties field descriptions

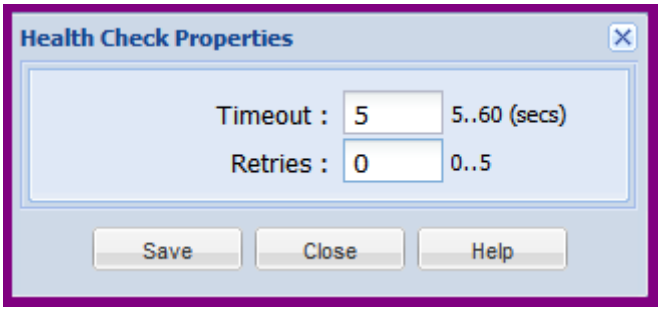
Field	Description
Concurrent Limit	Defines number of concurrent processing to be made while performing group operations. Default value is 10.
Show Temperature In	Refers to the temperature sensor display in Celsius (^{o}C) or Fahrenheit (^{o}F). Default setting is ^{o}F.

Changing the Default Health Check Properties

The health check properties control the timeout and the retries used while performing the periodic health check for the discovered switches. See Figure 15 on page 102 for an example of the Health Check Properties window.

1. Choose menu **Options > Health Check Properties**.
2. Change the Timeout setting. The value range is 5 to 60 seconds.
3. Change the Retries setting. The value range is 0 to 5.
4. Click **Save**. The changes take effect during next health check polling.

Figure 15 Health Check Properties Window

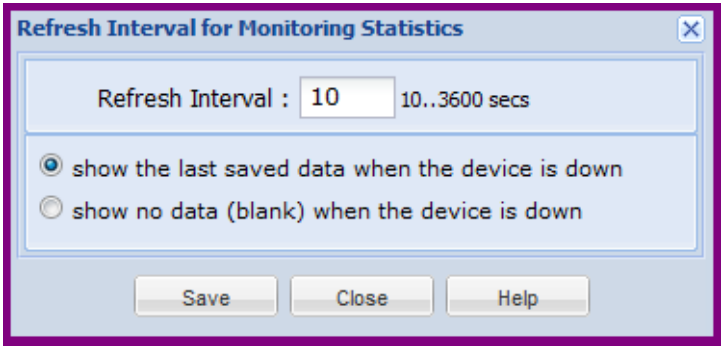


Changing the Default Refresh Configuration Parameters

The refresh configuration parameters control how frequently Switch Center updates the statistics tables in the user interface. The statistics tables are updated by loading information from the Switch Center database. For example, if you set the polling configuration parameters to 20 seconds, the switch statistical information is refreshed every 20 seconds. The new parameter takes effect immediately. See Figure 16 on page 103 for an example of the Refresh Configuration parameters window.

1. Choose menu **Options > Refresh Configuration**.
2. Enter the new value for Refresh Interval between 10 to 3600 seconds.
3. Select one of the options that enables Switch Center to display either the last saved data or no data (blank) when the selected device is down.
4. Click **Save**.

Figure 16 Refresh Interval for Monitoring Statistics Window



Changing the Default Data Collection Configuration Parameters

The data collection parameters control how often Switch Center collects switch data from the database. See Figure 17 on page 104 for an example of the data collection parameter configuration window.

1. Choose menu **Options > Data Collection Configuration**.
2. Enter new values for HealthCheck Server and Performance Statistics polling intervals. For HealthCheck Server, the value ranges from 10 to 3600 seconds. For Performance Statistics, the value ranges from 5 to 3600 seconds.
3. Click **Save**. The new parameter takes effect immediately.

Figure 17 Data Collection Configuration Window

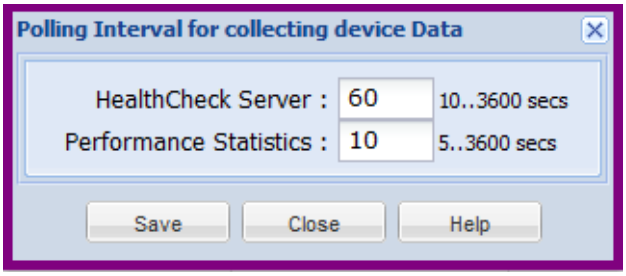


Table 18 Data Collection Properties field descriptions

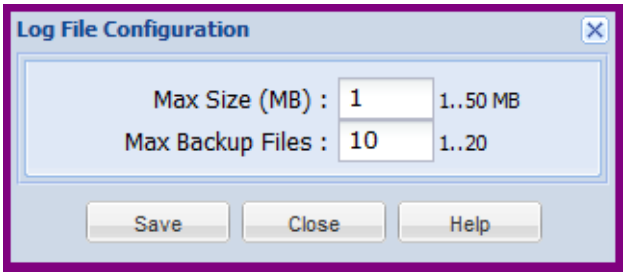
Field	Description
HealthCheck Server	Defines the interval in seconds that SNSC checks the switch status, either up or down.
Performance Statistics	Defines the interval in seconds that SNSC collects and updates performance statistics.

Changing the Default Log File Configuration Parameters

The log file configuration parameters control the log file size and the maximum number of log file backup that Switch Center can keep at any given time. You can change the log file configuration using the following steps:

1. Choose menu **Maintenance > Log File Configuration**.
2. Enter the new value for maximum file size in MB (Max Size (MB)) between 1 to 50.
3. Enter the new value for maximum number of backup files to keep the log messages (Max Backup Files) between 1 to 20.
4. Click **Save**.

Figure 18 Log File Configuration Window



Changing the Default DB Data Purge Configuration Parameters

The database purge parameters control the frequency of database purges. After a database purge, information about events, syslog and performance data are removed. You can select days or events count as the basis for database purge frequency.

For example, if the purge frequency is set for seven days, then the data older than seven days are purged regularly. The purged data is stored in text form and you can find these files in the following directory: <*SNSC INST DIR*>`/database/backup`. The purged data files are created using the following notation:

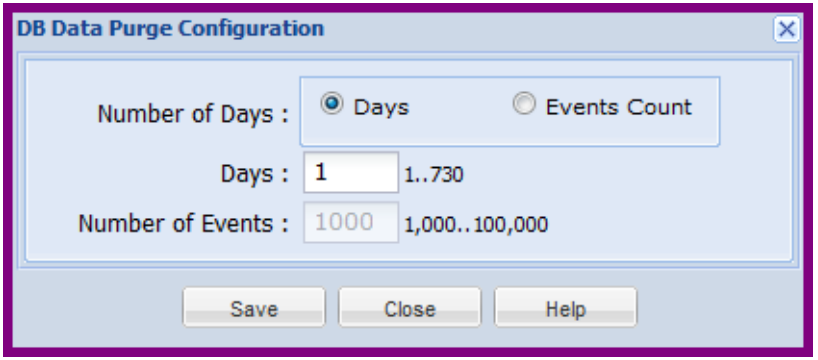
- `events_DDMMMYYYY_HHMMSS.txt`
- `syslogs_DDMMYYYY_HHMMSS.txt`

In the above notation, DD stands for day (01-31), MMM stands for month (Jan, Feb, and so on), YYYY stands for year, HH for Hour (00-23), MM for minutes (00-59) and SS for seconds (00-59). However, you can change the purged data location and the format of the timestamp, by editing the DBPurgeDirectory and the TimeStampFormat parameters in the following file: `backup.properties` (see “Modifying the backup.properties Configuration File” on page 152).

1. Choose menu **Maintenance > DB Data Purge Configuration** (see Figure 19 on page 107).
2. Click Days or Events Count as the purge frequency parameter.
3. Complete the following steps if you selected Days. If you selected Events Count, go to step 4.
   a. Enter a value between 1 and 730 in the Number of Days field.
   b. Click **Save**.
4. If you selected Events Count, complete the following steps.
   a. Enter a value between 1000 and 100,000 in the Number of Events field.
   b. Click **Save**.

The new values take effect immediately.

Figure 19 DB Data Purge Configuration Window



Configuring Authentication

You can configure Switch Center to use different authentication mechanisms for authenticating Switch Center users. The following subsections list different mechanisms supported by Switch Center:

- Local Authentication
- TACACS+ Authentication
- RADIUS Authentication

Local Authentication

Local authentication is enabled by default in Switch Center. In this mechanism, the user credentials are stored in Switch Center database in encrypted format. You can configure Switch Center to use local authentication (in case, if authentication is set to a different mechanism) using the following steps:

1. Choose menu **Options > Authentication Configuration**.
2. Select LOCAL as the authentication mechanism.
3. If Admin is mapped to root, enter the Admin password in Admin Password field, or enter root password in Root Password field.
4. Click **Save**.

TACACS+ Authentication

Switch Center supports the default and the alternate TACACS+ authorization levels (similar to IBM BLADE switches). The following table shows authorization levels for the default and the alternate TACACS+ settings, one of which must be defined on the TACACS+ server.

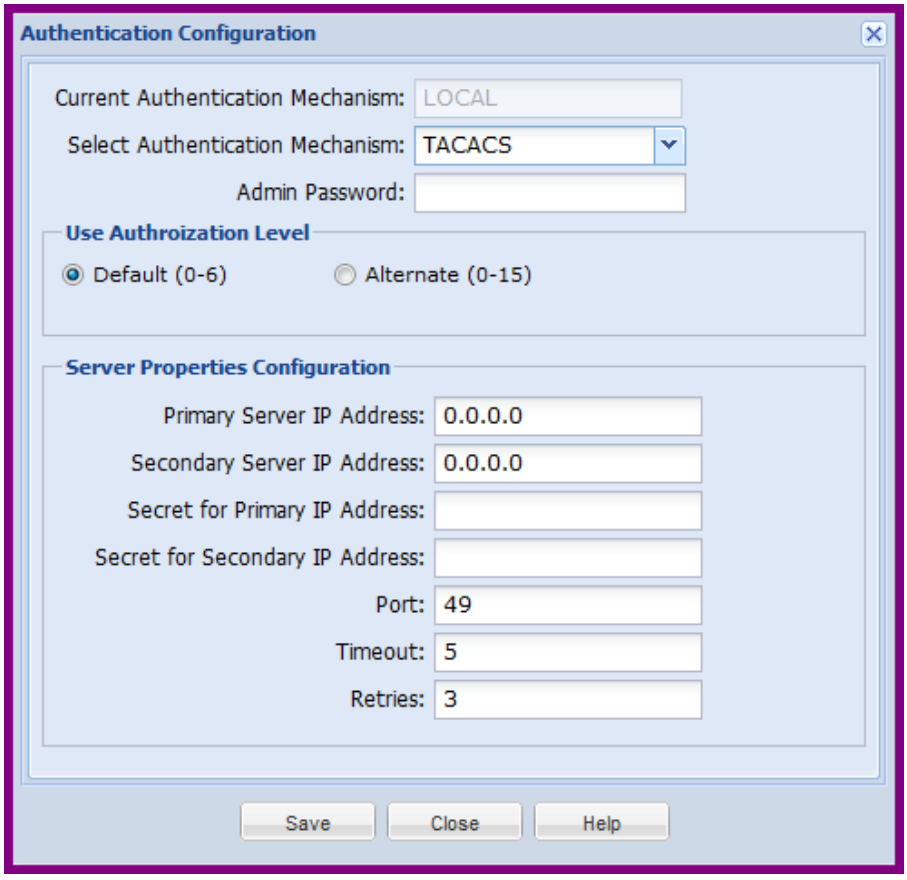
Table 19 TACACS+ Authorization Levels

User Access Level	Default TACACS+ Authorization Level	Alternate TACACS+ Authorization Level
`user`	0	0 - 1
`oper`	3	6 - 8
`admin`	6	14 - 15

You can configure Switch Center to use TACACS+ authentication, using the following steps:

1. Choose menu **Options > Authentication Configuration**.
2. Select TACACS as the authentication mechanism to bring up TACACS+ specific fields (see Figure 20 on page 111).
3. If Admin is mapped to root, enter the Admin password in Admin Password field, or enter root password in Root Password field.
4. Select the authorization level to use – Default or Alternate (see Table 19).
5. Enter the primary server IP address.
6. Enter the secondary server IP address.
7. Enter the secret for the primary server.
8. Enter the secret for the secondary server.
9. Enter the port number.
10. Enter a value for the timeout.
11. Enter a value for retries.
12. Click **Save**.

Figure 20 TACACS Authentication Configuration Window



You can configure Switch Center to use local authentication (in case, if authentication is set to a different mechanism) using the following steps:

1. Choose menu **Options > Authentication Configuration**.
2. Select LOCAL as the authentication mechanism.
3. If Admin is mapped to root, enter the Admin password in Admin Password field, or enter root password in Root Password field.
4. Click **Save**.

Note: If Switch Center is unable to contact either Primary or Secondary TACACS+ servers, it uses the local authentication mechanism for validating the user credentials.

RADIUS Authentication

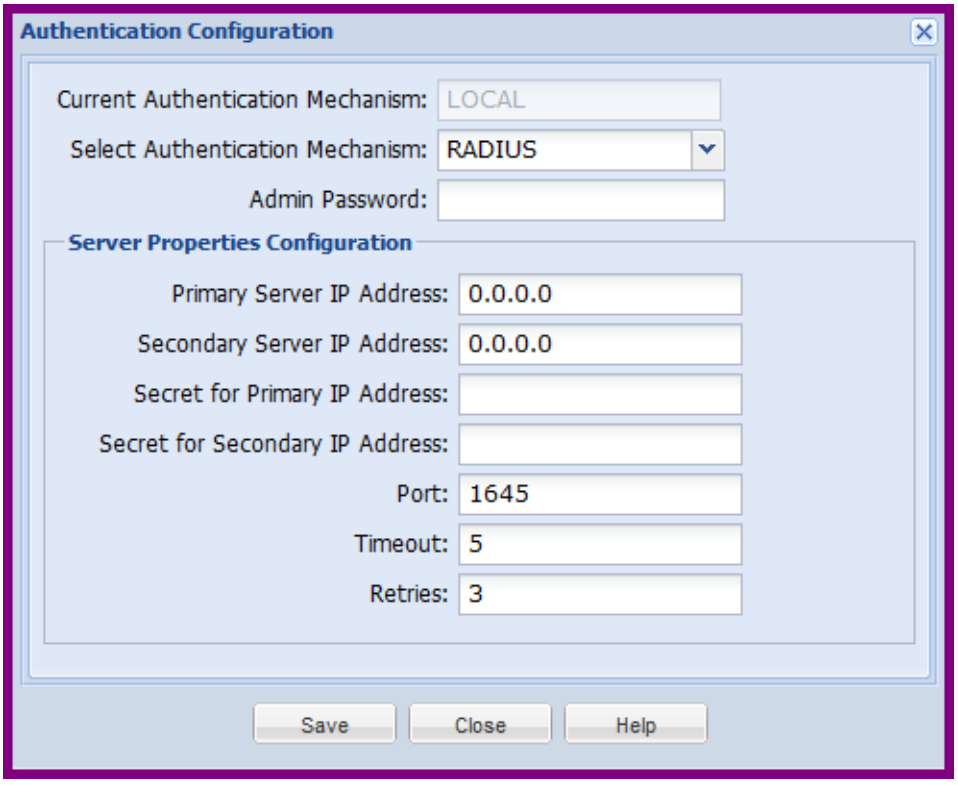
For RADIUS authentication, similar to those requirements for IBM BLADE switches, Switch Center requires all user privileges, other than those assigned to the Administrator, have to be defined in the RADIUS dictionary. RADIUS attribute 6 which is built into all RADIUS servers defines the administrator. The file name of the dictionary is RADIUS vendor-dependent. The following RADIUS attributes should be configured on the RADIUS server:

User Name/Access	User Service Type	Value
`user`	*Vendor supplied*	255
`oper`	*Vendor supplied*	252
`admin`	*Vendor supplied*	6

You can configure Switch Center to use RADIUS authentication using the following steps:

1. Choose menu **Options > Authentication Configuration**.
2. Select RADIUS as the authentication mechanism to bring up RADIUS specific fields (see Figure 21 on page 113).
3. If Admin is mapped to root, enter the Admin password in Admin Password field, or enter root password in Root Password field.
4. Enter the primary server IP address.
5. Enter the secondary server IP address.
6. Enter the secret for the primary server.
7. Enter the secret for the secondary server.
8. Enter the port number.
9. Enter a value for the timeout.
10. Enter a value for retries.
11. Click **Save**.

Figure 21 RADIUS Authentication Configuration Window



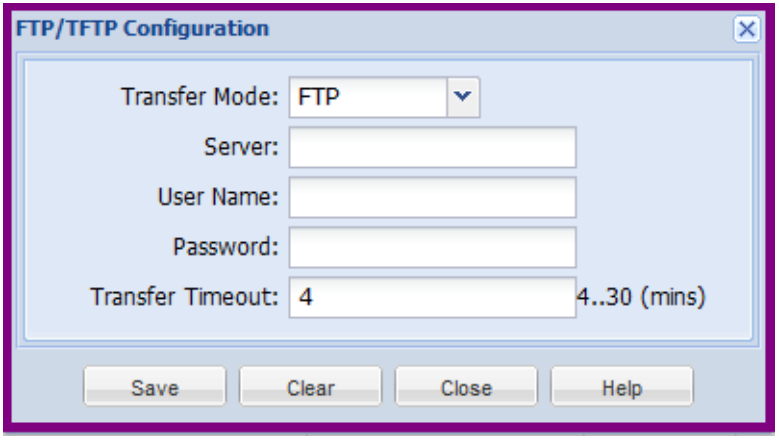
Note: If Switch Center is unable to contact either Primary or Secondary RADIUS servers, it uses the local authentication mechanism for validating the user credentials.

Configuring FTP/SFTP/TFTP Server Parameters

You must configure an FTP, TFTP, or SFTP server before you can perform switch administration tasks such as image and configuration backup, image download, panic dump and so forth. For information about switch administration tasks, and the role of the FTP/SFTP/TFTP server, see “Performing Group Operations” on page 181.

1. Choose menu **Options > FTP/SFTP/TFTP Configuration**.
2. Select FTP, TFTP, or SFTP as the transfer mode.
3. Enter the IP address of the FTP, TFTP, or SFTP server.
4. If you selected FTP as the transfer mode:
   a. Enter the FTP server user name.
   b. Enter the FTP server password.
5. Enter the transfer timeout in minutes. This timeout setting is useful for dealing with an FTP/SFTP/TFTP server residing in a slow network.
6. If you selected SFTP as the transfer mode:
   a. Enter the SFTP server user name.
   b. Enter the SFTP server password.
   c. Enter the transfer server port (optional).
7. Click **Save**.

Figure 22 FTP/SFTP/TFTP Server Configuration Window



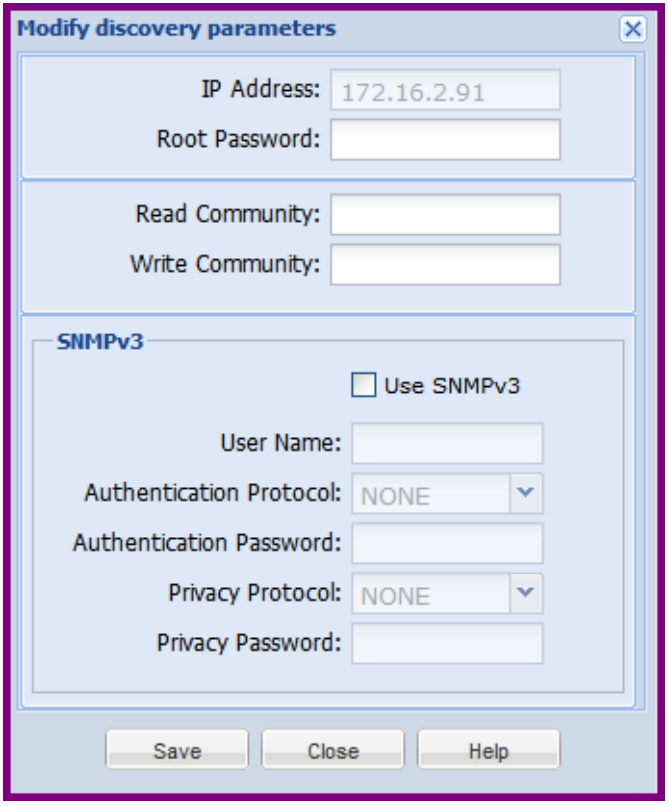
Modifying Discovery Parameters

You can modify SNMP parameters of a discovered device. This helps Switch Center continue to manage the device if the SNMP parameters, such as community strings (SNMPv1/v2c) or authentication credentials (SNMPv3), are changed after discovering the device in Switch Center.

To modify the SNMP parameters:

1. In Device List table, select the switch for which you want to change the SNMP parameters used by Switch Center for managing that switch.
2. Choose menu **Device > Change SNMP Parameters** to open Modify dialog (see Figure 23 on page 116).
3. If Root user is enabled, enter the root password in Root Password field (this field is not visible if Root user is disabled).
4. If you want to use SNMPv1 or SNMPv2c:
   a. Enter the new read and write community strings in Read Community and Write Community fields respectively.
   b. Click **Save**. Switch Center begins using the supplied SNMPv1 or SNMPv2c parameters for managing that switch.
5. If you want to use as SNMPv3:
   a. Click **Use SNMPv3**.
   b. Enter the new user name in User Name field.
   c. If Authentication is enabled on the switch (switch is configured in AuthNoPriv or AuthPriv), select the authentication protocol (MD5 or SHA1) from Authentication Protocol list and enter the authentication password in Authentication Password field.
   d. If Privacy is enabled on the switch (switch is configured in AuthPriv), select DES in the Privacy Protocol list and enter the privacy password in the Privacy Password field.
   e. Click **Save**. Switch Center begins using the supplied SNMPv3 parameters for managing that switch.

Figure 23 Modify Discovery Configuration Window



VM Management Server – Connector Configuration and VMware Infrastructure (VI) Client Integration

Switch Center provides the following advanced support:

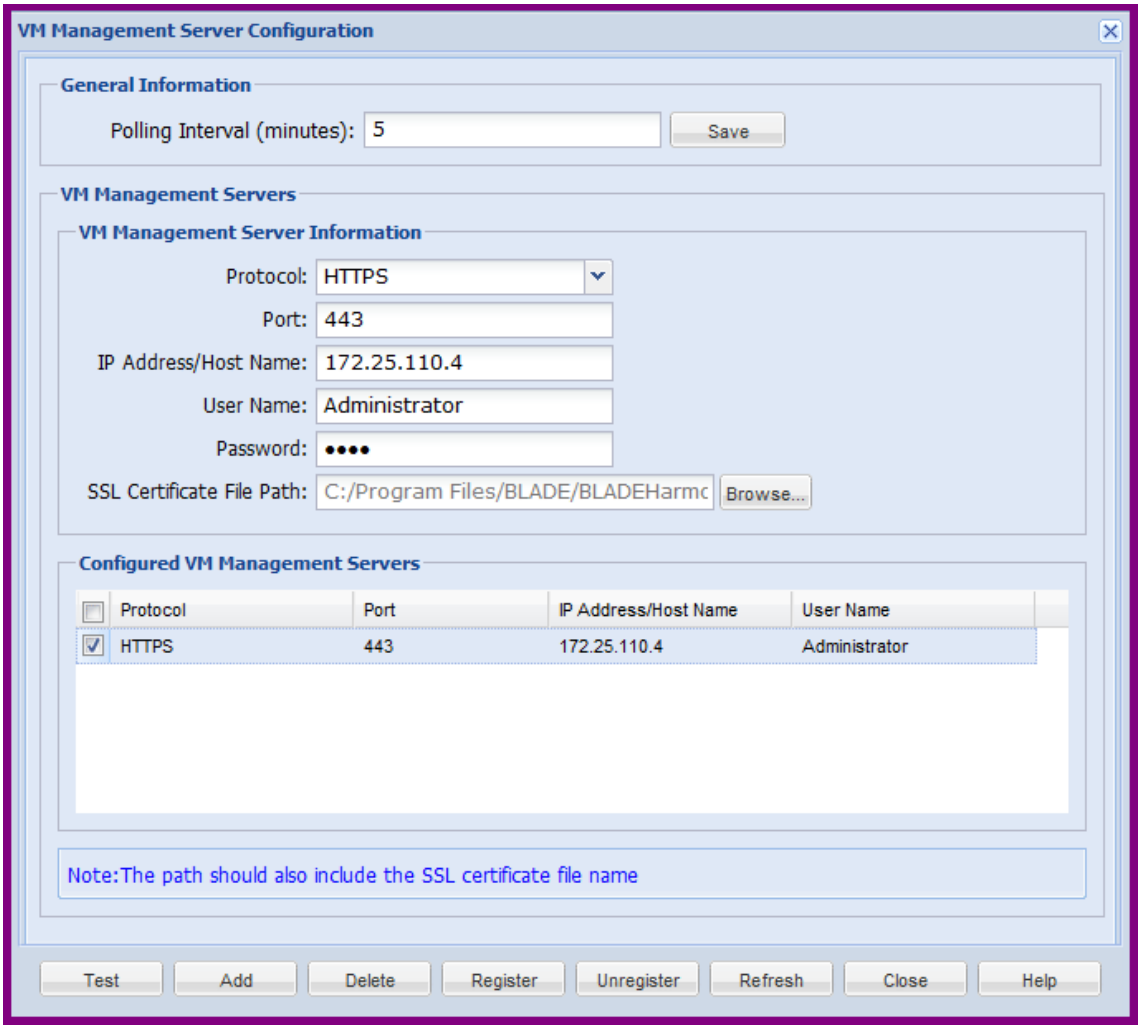
- Viewing the virtual switch information that are available in VMready switch versions.
- Integrating Switch Center with VMware Infrastructure (VI) Client application so that Switch Center can be launched inside VMware Infrastructure (VI) Client.

Configuring VM Management Server Connector

In order to retrieve Virtualization information from the VirtualCenter and to integrate Switch Center with VMware Infrastructure (VI) Client, it is necessary to configure VM Management Server Connector. The VM Management Server Connector retrieves the required information by interacting with the VirtualCenter.

1. Choose menu **Options > VM Management Server Connector > Configuration** to launch the VM Management Server Configuration window (see Figure 24 on page 118).
2. Select the protocol to be used for connecting to VirtualCenter. If you are using HTTPs, it is mandatory to generate the keystore.
3. In the Port field, enter the port on which VirtualCenter is listening for HTTP or HTTPs requests.
4. In the IP Address/Host Name field, enter IP address or host name of the system on which Virtual Center is running.
5. Enter the user name in User Name field that should be used for authenticating with VirtualCenter.
6. Enter the password in Password field that should be used for authenticating with VirtualCenter.
7. If you have selected HTTPS protocol, enter the path of the file containing SSL Certificate. If you select HTTPS protocol, enter the file path that contains the SSL certificate or click Browse to browse for the file.
8. (Optional) To check whether the given address and login credentials are valid, click **Test**.
9. Click **Add** to save the configuration.
10. (Optional) In the Polling Interval field, enter the polling interval in minutes to be used for periodically contacting VirtualCenter to retrieve the information and click **Save** to store the configured value.

Figure 24 VM Management Server Configuration Window



Integrating IBM System Networking Switch Center with VMware Infrastructure (VI) Client Application

You can integrate Switch Center UI with VMware Infrastructure (VI) Client Application so that Switch Center can be conveniently launched within VI Client environment (see Figure 25 on page 120).

1 Choose menu **Options > VM Management Server Connector > Configuration** to launch the VM Management Server Configuration window (see Figure 24 on page 118).

2 Select the VM Management Server to use from the Configured VM Management Servers table (see “Configuring VM Management Server Connector” on page 117 for steps on how to configure VM Management Server connector).

3 Click **Register**. If there are any errors, Switch Center displays that error message.

You can also check whether Switch Center is registered with VMware Infrastructure (VI) Client application or not using the following steps:

1 Launch VI client application (if it is already running, then close it and launch it again)

2 Choose menu **Plug-ins > Manage Plug-ins** to launch Plug-in Manager window

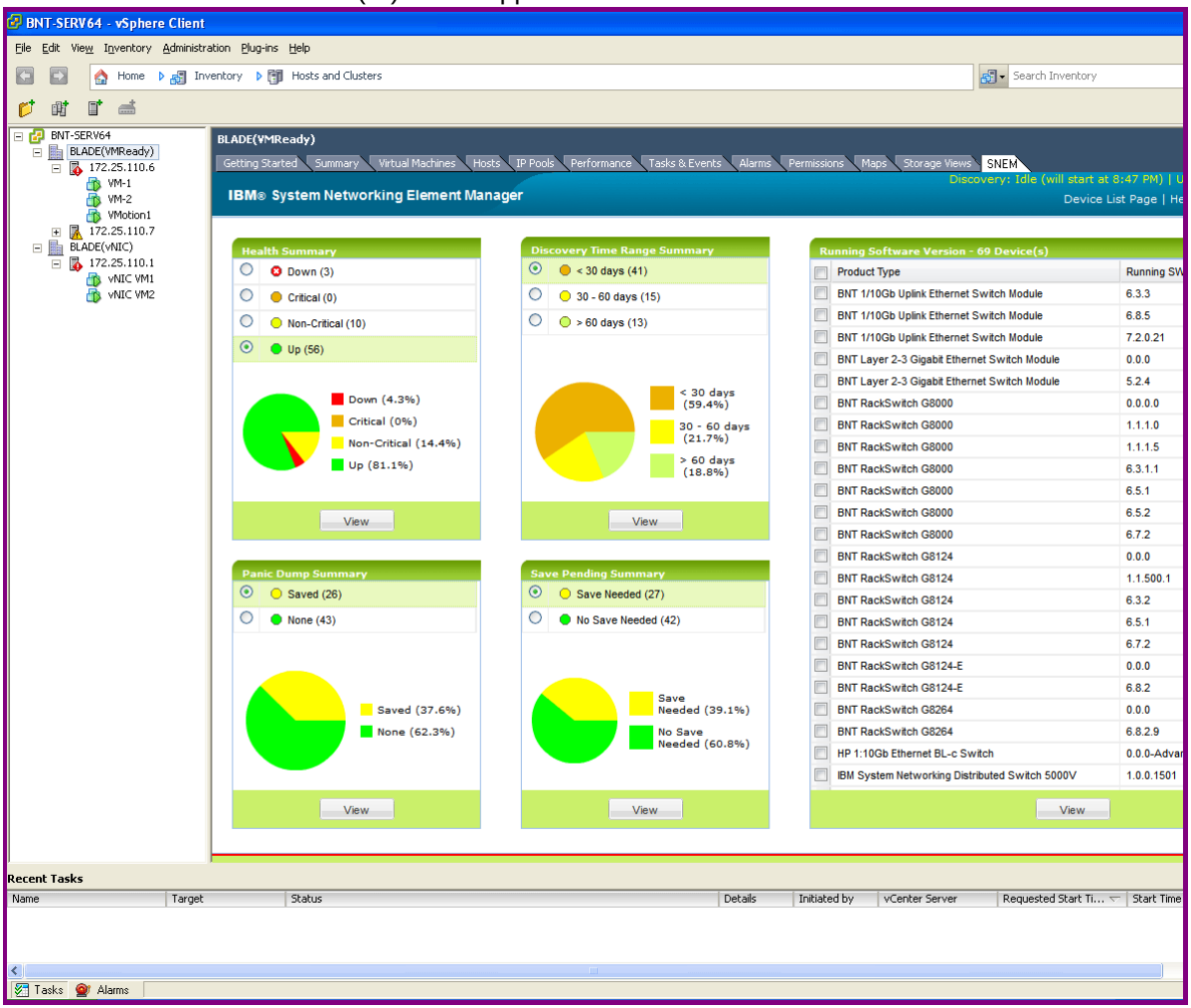
3 If Switch Center is successfully registered, you will see an entry for IBM System Networking Switch Center under Installed Plug-ins section.

Launching IBM System Networking Switch Center from VMware Infrastructure (VI) Client Application

1 Once you have integrated Switch Center in VM Management Server, launch VMware Infrastructure (VI) client application. Note that if VMware Infrastructure (VI) Client application is already running, you have to close and restart it to enable VI Client to download the newly added plug-in (IBM System Networking Switch Center).

2 Select Switch Center tab in VI Client (see Figure 25 on page 120) to bring up the Switch Center login page.

Figure 25 IBM System Networking Switch Center Launched Inside VMware Infrastructure (VI) Client Application



Un-registering IBM System Networking Switch Center from VMware Infrastructure (VI) Client Application

1. Choose menu **Options > VM Management Server Connector > Configuration** to launch the VM Management Server Configuration window (see Figure 25 on page 120).
2. In the Configured VM Management Servers table (see “Configuring VM Management Server Connector” on page 117), select the VM Management Server from which you want to un-register Switch Center.

3 Click **Unregister**.

Dial Home Configuration

The Dial Home feature offers a round-the-clock device monitoring facility. It enables you to configure Switch Center to send an email alert to designated recipients upon receiving traps from the switches.

To configure Dial Home:

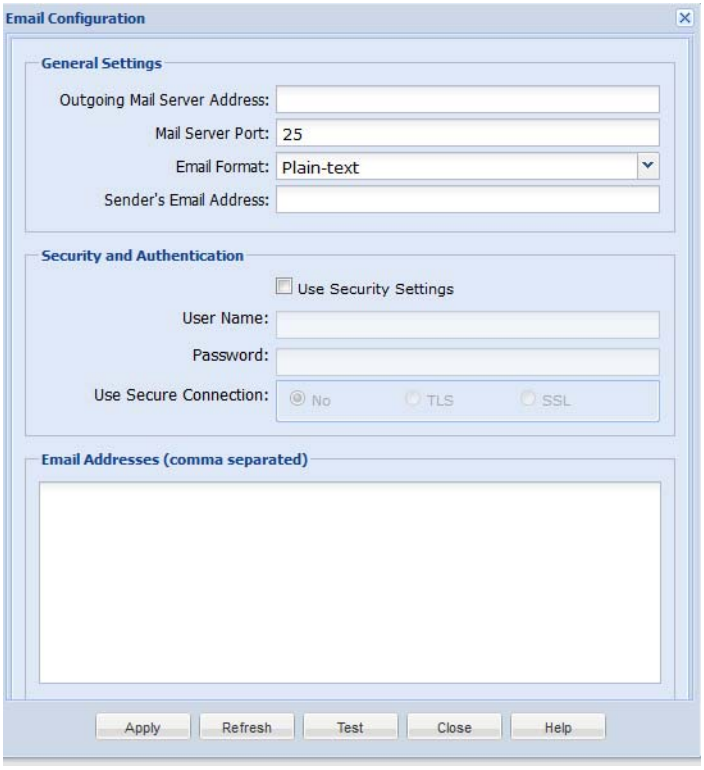
- Log into SNSC as an Administrator.
- Specify the outgoing email server to use and a list of recipients' email addresses.
- Select the traps for which the email alerts are to be sent.

Configuring Email Parameters

You can configure email parameters, such as Outgoing Mail Server, Email Format, Sender's Mail ID, and Recipient Email Addresses to be used for sending email alerts:

1 Choose menu **Options > Dial Home > Email Configuration** to launch the Email Configuration window.

Figure 26 Email Configuration Window



2 In the **Outgoing Mail Server Address** field, enter the outgoing mail server address .

3 Enter the **Mail Server Port** to use. By default, it is set to SMTP port 25.

4 From the **Email Format** list, select the format in which the email alert is to be sent. You can send email alerts in plain text or in XML.

5 In the **Sender's Email Address** field, enter teh address from which the email alerts are to be sent.

6 If you are using a POP3 mail server, you can configure additional security and authentication parameters as follows:

   a Check **Use Security Settings**.

   b Enter the User Name.

   c Enter the Password.

   d Next to **Use Secure Connection**, select either **No**, **TLS**, or **SSL**.

7 In the **Recipient Email Address** field, enter the recipients' email addresses, separated by a comma.

8 Before saving the configuration, verify whether the outgoing mail server address by clicking **Test**.

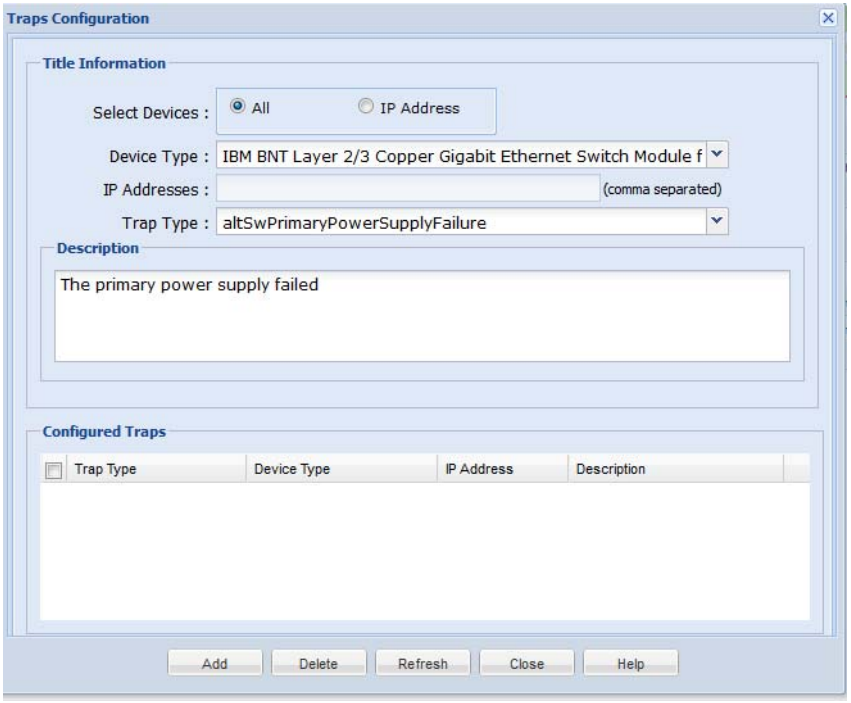
9 Click **Apply** to save the changes.

Adding Traps for Dial Home

To add traps for Dial Home:

1 Choose menu **Options > Dial Home > Traps Configuration** to launch the Traps Configuration window.

Figure 27 Traps Configuration Window



2 You can add traps applicable to all switches or specific to a list of IP addresses by selecting the **All** or **IP Address** option from **Select Devices**.

3 From the **Device Type** list, select the device.

4 If you select the **IP Address** option, in the **IP Addresses** field, enter a list of comma-separated IP addresses.

5 From the **Trap Type** list, select the traps to add for Dial Home.

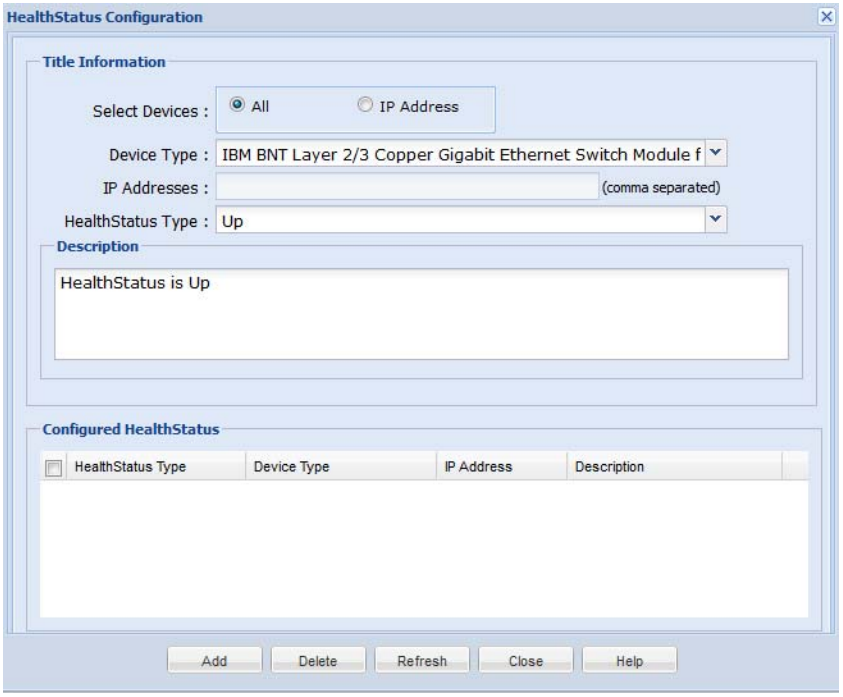
6 Click **Add** to add the selected traps.

Adding Health Status Messages for Dial Home

To add health status message for Dial Home:

1 Choose menu **Options > Dial Home > HealthStatus Configuration** to launch the HealthStatus Configuration window.

Figure 28 HealthStatus Configuration Window



2 You can add health status messages applicable to all switches or specific to a list of IP addresses by selecting the **All** or **IP Address** option from **Select Devices**.

3 From the **Device Type** list, select the device.

4 If you select the **IP Address** option, in the **IP Addresses** field, enter a list of comma-separated IP addresses.

5 From the **HealthStatus Type** list, select the health status messages to add for Dial Home.

6 Click **Add** to add the selected messages.

Email Message Format

When sending out email alerts, the display string OID (xxSwTrapDisplayString) that is normally associated with the trap is used as the Subject line. However, if the display string is missing, the trap description is used instead for the Subject line.

The Subject line also contains the IP address of the switch that emitted the trap, along with the trap type. The format of the Subject line is:

<IP Address>, <Trap Type>, <Variable Binding>

For example, a login failure (altSwLoginFailure) coming from a switch at IP address 192.168.1.10 with xxSwTrapDisplayString variable binding containing the information "Failed login attempt via TELNET from host 192.168.1.50" will be sent with the subject line as:

```
192.168.1.10, altSwLoginFailure, Failed login attempt via
TELNET from host 192.168.1.50
```

In the message body, the information associated with other variable bindings are included. The following example shows a typical message format (by taking various examples of the configurations files shown in the previous sections)

```
From: bhmadmin@foo.com
To: zone1oper@foo.com, zone2oper@foo.com
Subject: 192.168.1.10, altSwLoginFailure, Failed login attempt
via TELNET from host
192.168.1.50
IP Address: 192.168.1.10
Trap Type: altSwLoginFailure
Description: Failed login attempt via TELNET from host
192.168.1.50
Severity: Major
Timestamp: Mon Sep 01, 2008 ...
Variable Bindings Information:
1. Sys Name: XYZ
2. Sys Location: SC
Sys Contact: Foo Admin
```

Switch Center can be configured to send email messages in either plain text or XML. If using XML, the following schema is used for the message body:

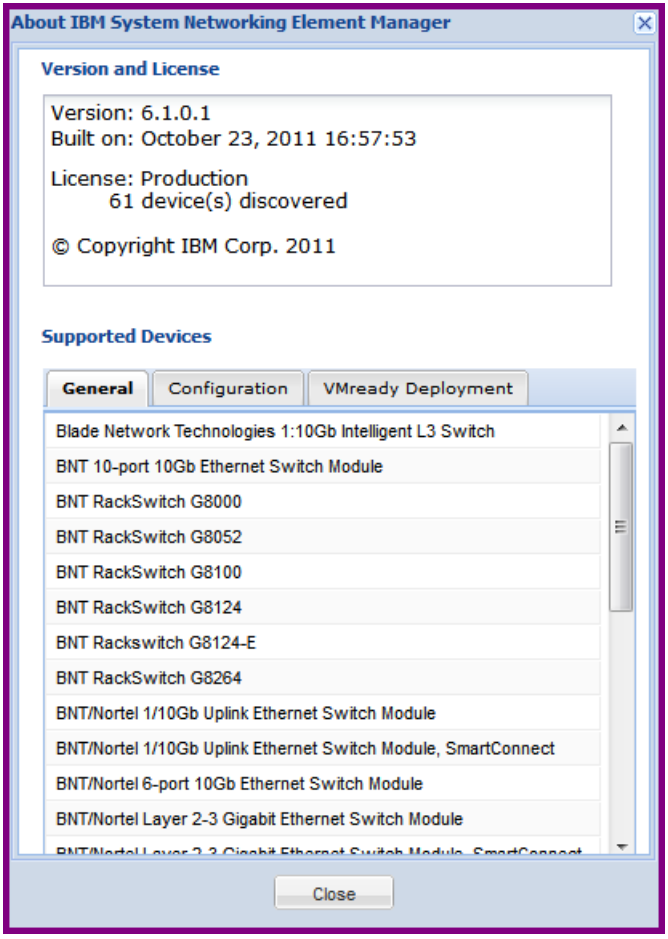
```
<message-body>
<ip-address>...</ip-address>
<trap-type>...</trap-type>
<description>...</description>
<severity>...</severity>
<timestamp>...</timestamp>
<varbind name="XXX" value="..."/>
<varbind name="XXY" value="..."/>
...
</message-body>
```

How to View Information About Switch Center

1. Choose menu **Help > About** IBM System Networking Switch Center to view information about the software version, supported devices and related data.
2. Click **General** tab to view the supported devices.
3. Click **Configuration** tab to view those devices for which configuration management is supported. It should be noted that not all devices listed in General tab are found in Configuration tab. This is due to the availability of configuration management feature to selected devices.
4. Click the **VMready Deployment** tab to view the devices for which the VMready Across Datacenter Wizard configurations are supported.
5. Click **Close** to close the window.

Tip: Choose menu **Help >IBM Systems Networking** to access the IBM's Systems Networking Web site. The IBM Systems Networking Web page opens up in a new browser window and your Switch Center session remains active.

Figure 29 About IBM System Networking Switch Center Window



How to View Logs

The log viewer feature lets you see specific information logged about actions and scheduled tasks. All information is specific to the Switch Center application, not to any selected devices. For example, you can view a log of the scheduled backups, or look at the log generated by the most-recent Switch Center auto discovery process.

Switch Center has an automatic log archive program. After each log reaches the default size of 1 Mb, Switch Center starts a new log and saves the previous logfile as *<logfilename>*`.`*xx*`.log`. For example, you might have CMI logs named `cmi.1.log`, `cmi.2.log` and so forth. The current file is always named *<logfilename>*`.log`. The oldest archive would be `cmi.1.log`.

When the quantity of archived log files reaches the default maximum of ten, the older file is deleted and the others are moved up. For example, *x*`.1.log` is deleted and *x*`.2.log` is renamed as *x*`.1.log` and so forth.

To modify the default log file size and maximum number of backup files, log in to the Switch Center server and open log.properties under *<INSTALLATION DIR>*`\conf` directory. Edit the `LogFileMaxSizeKB` parameter to modify the maximum log file size. Edit the `MaxBackupFiles` parameter to modify the maximum number of maximum backup files. See “Modifying the log.properties Configuration File” on page 150.

To view the archived log files, log in to the Switch Center server and open log files residing under the following directory: *<INSTALLATION DIR>*`/logs`

Navigating the Log Files

This section describes the navigation controls available on each log window.

Tip: Some log files can be more than 100 pages. Use your printer's Page Range feature to avoid printing the entire log.

Figure 30 Log File Navigation Controls

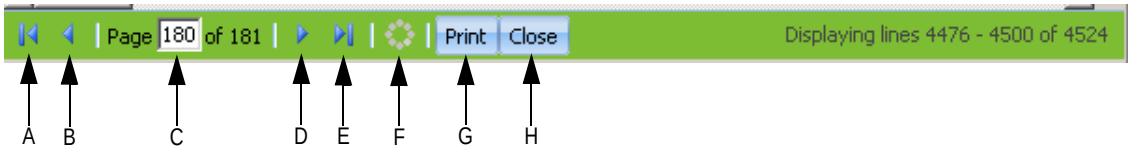


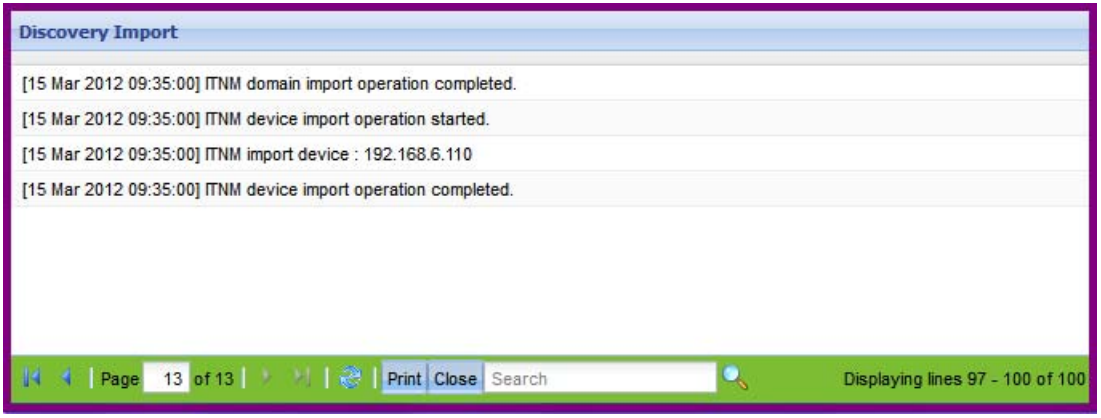
Table 20 Log File Navigation Controls

Control	Description
A	Go to first page of the log.
B	Go to the previous page.
C	Type a page number and click **Enter** to view the chosen page.
D	Go to the next page.
E	Go to the last page.
F	Refresh the current view of the log file.
G	Print the log.
H	Close the log viewer window.

Viewing the Discovery Import Log

This log captures data about the most recent import of devices and the network domains from Tivoli Network Manager.

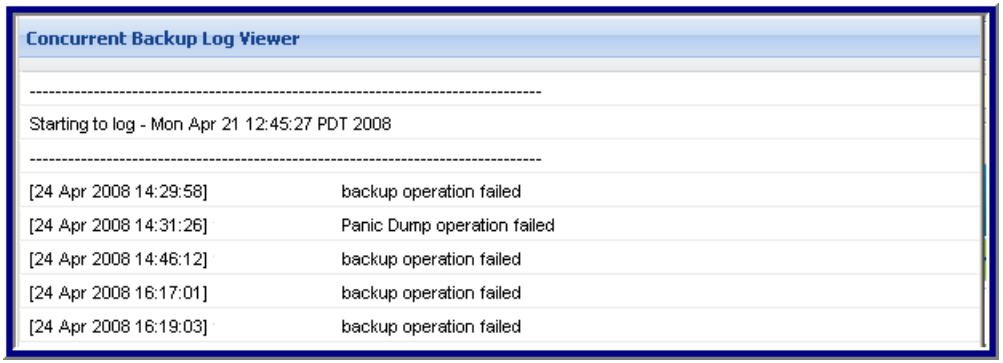
Figure 31 Discovery Import Log Viewer



Viewing the Concurrent Backup Log

This log captures status of concurrent backup tasks.

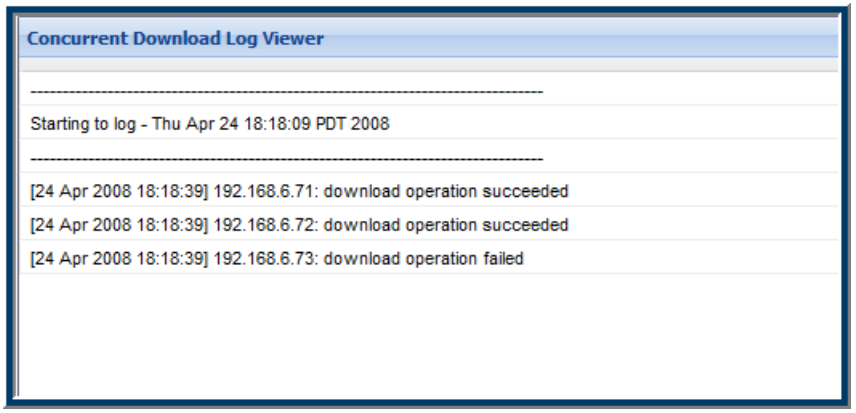
Figure 32 Concurrent Backup Log Viewer



Viewing the Concurrent Download Log

This log displays entries for Image Upgrade, Config Upgrade operations that are not scheduled.

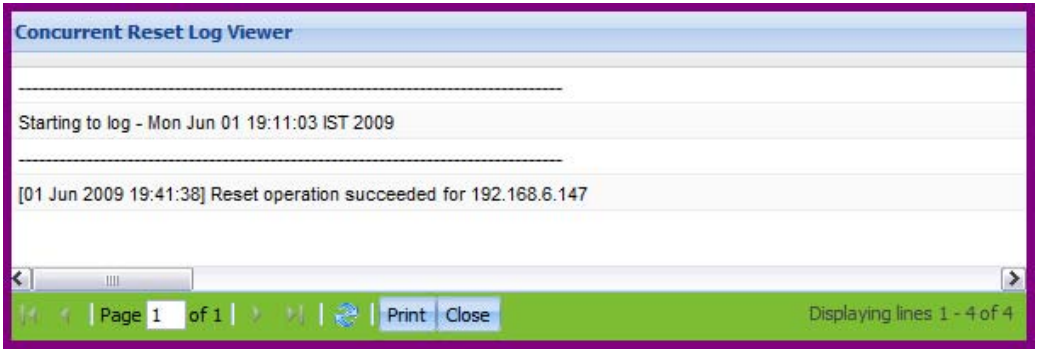
Figure 33 Concurrent Download Log Viewer



Viewing the Concurrent Reset Log

This log displays entries for switch reset/reboot operations that are not scheduled.

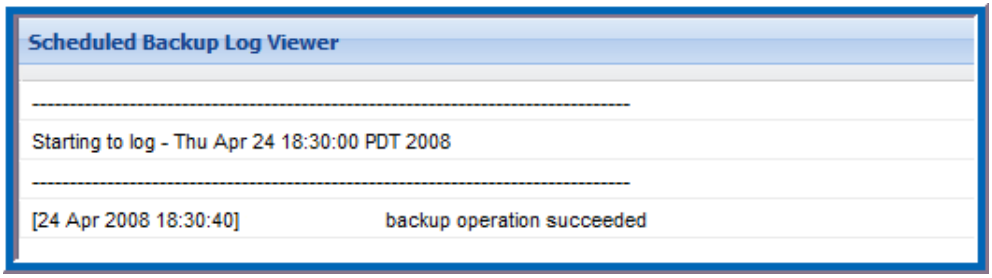
Figure 34 Concurrent Reset Log Viewer



Viewing the Scheduled Backup Log

This log captures status information about log entries for Image Backup, Config Backup, Panic Dump and TSDump operations that are scheduled in a job.

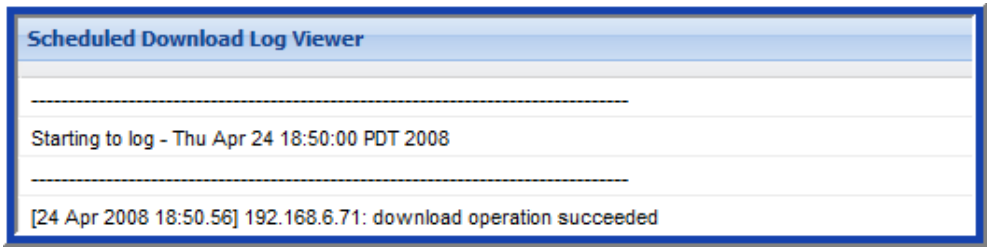
Figure 35 Scheduled Backup Log Viewer



Viewing the Scheduled Download Log

This log displays information about Image Upgrade and Config Upgrade operations that are scheduled in a job.

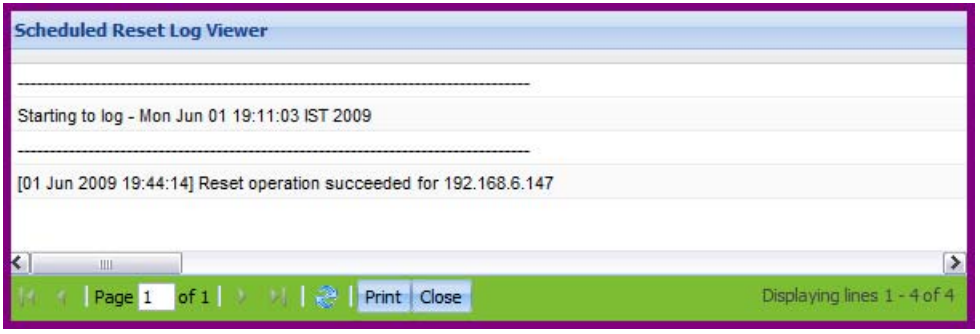
Figure 36 Scheduled Download Log Viewer



Viewing the Scheduled Reset Log

This log displays entries for switch reset/reboot operations that are scheduled in a job.

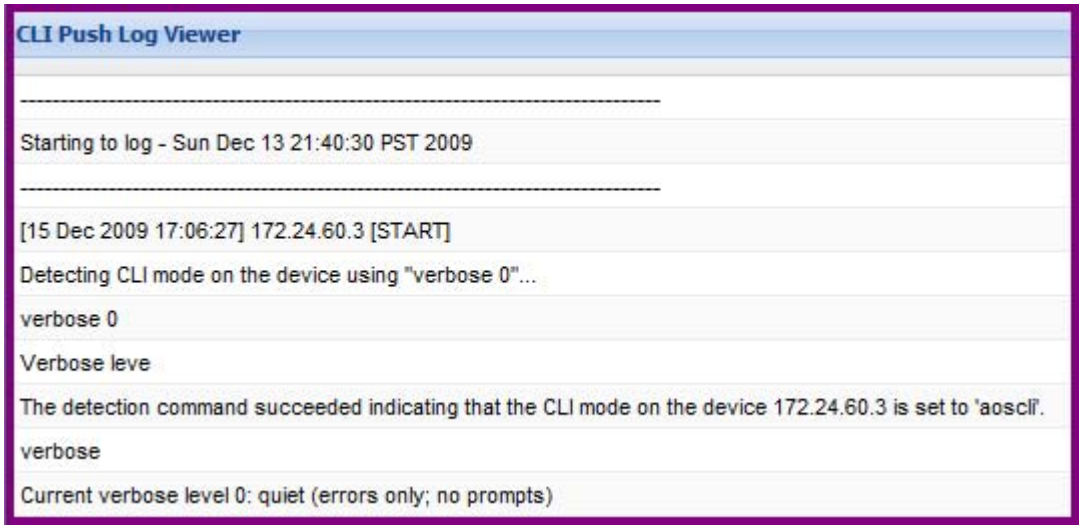
Figure 37 Scheduled Reset Log Viewer



Viewing the CLI Push Log File

This log displays the information dumped while performing the configuration upgrade for a switch using a set of CLI commands (CLI push).

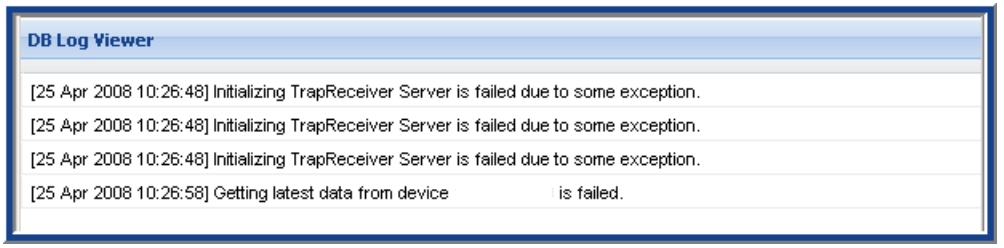
Figure 38 CLI Push Log Viewer



Viewing the DB Log File

This log file displays status information about Switch Center database activities.

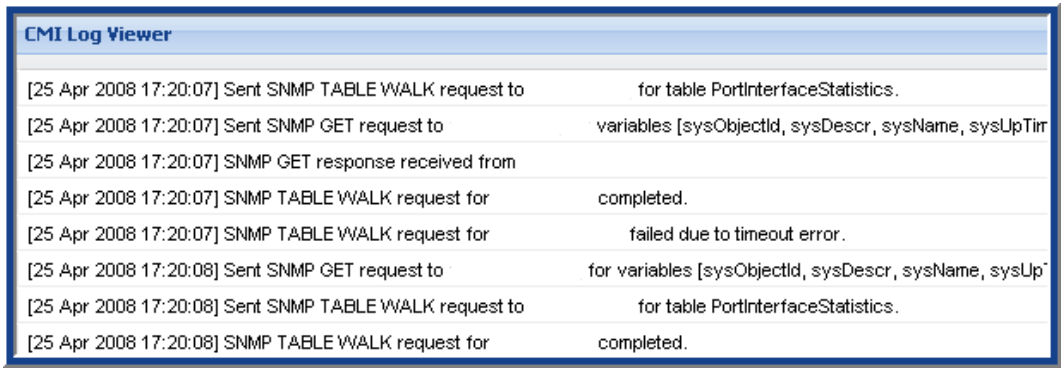
Figure 39 DB Log Viewer



Viewing the CMI Log

This log file captures date, time and status tasks performed by the Switch Center Common Management Interface (CMI). CMI is the Switch Center component that communicates with discovered devices. The CMI log viewer shows detailed communication between Switch Center and a device, including the IP address of the device.

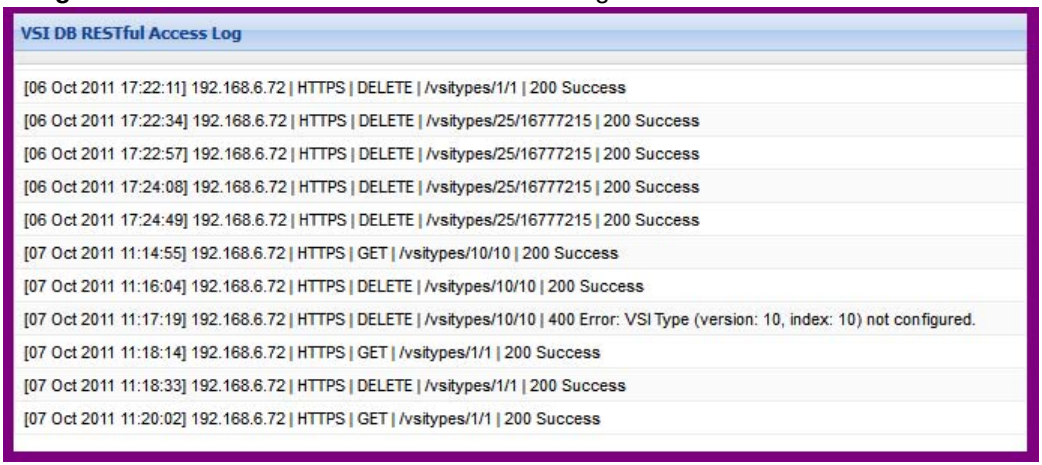
Figure 40 CMI Log Viewer



Viewing the VSI DB – RESTful Access Log

This log file contains the details of VSI DB access via REST APIs. The information includes the IP address of the client invoking REST API, type of request (GET/PUT/POST/DELETE), and the resource name. It also logs the status of each operation.

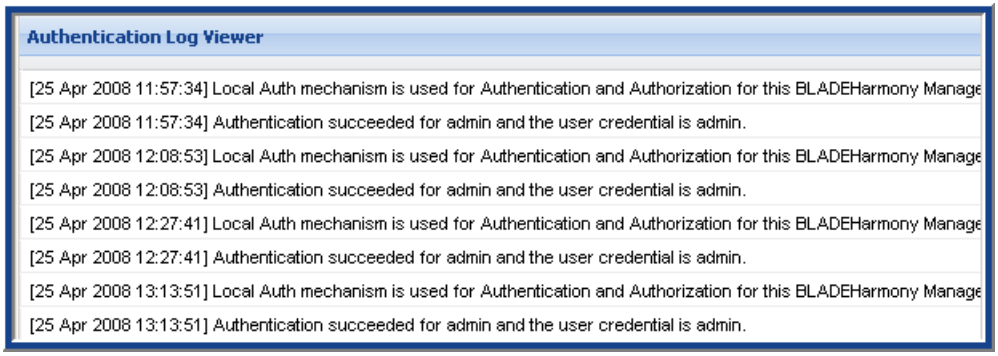
Figure 41 VSI Database – RESTful Access Log Viewer



Viewing the Authentication Log

This log provides date, time and a description about authentication activities.

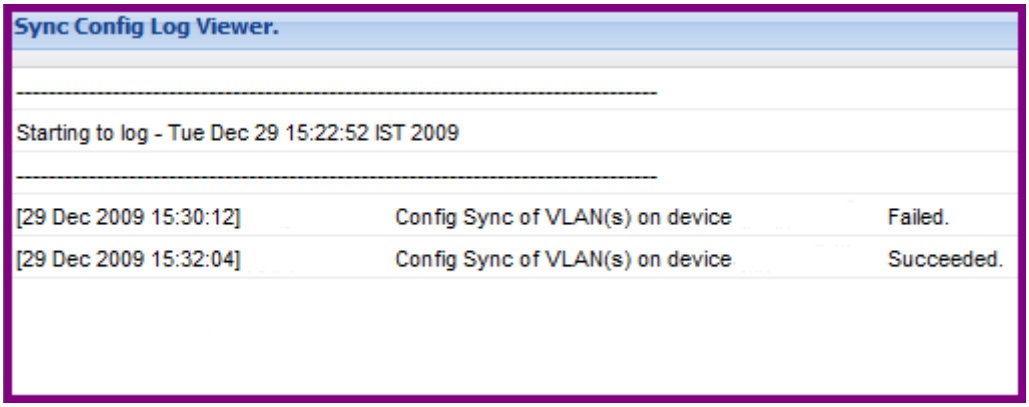
Figure 42 Authentication Log Viewer



Viewing the Sync Config Log File

This log contains date, time and status information about Sync Configuration tasks.

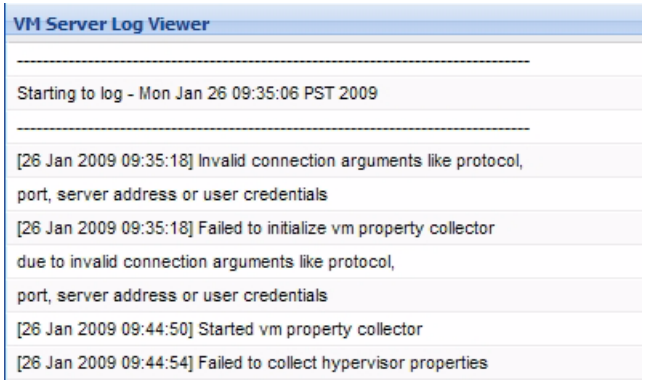
Figure 43 Sync Config Log Viewer



Viewing the VM Server Log

This logs the connectivity of Switch Center with VirtualCenter and any data collection failures that happen while communicating with VirtualCenter.

Figure 44 VM Server Log Viewer



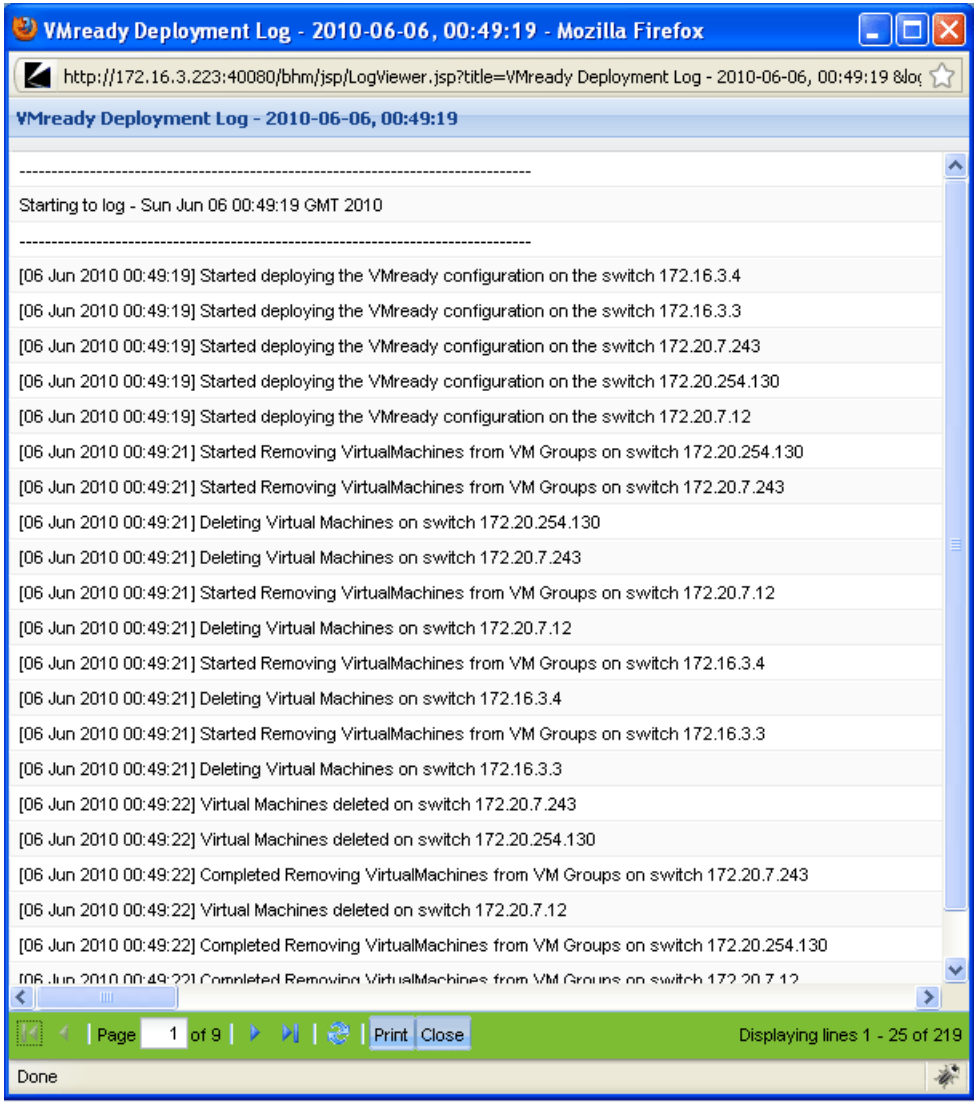
Viewing the VMready Deployment Log

This contains logs related to VMAP and VMready configuration deployment initiated from the VMready Across Datacenter wizard.

- **VMAP Log**: Logs details about any VMAP configurations that were deployed on switches from the wizard. **Note**: Each time a VMAP configuration is deployed, the previously stored log is erased.
- **VMready Log**: Logs details about the VMready configuration deployed by the wizard and also provides a means of viewing the snapshot of the configuration deployed.

To view the logs, select the date and time when the particular VMready configuration deployment was initiated and click **View** to view log of operations. See “VMready Log Viewer” on page 148. The configuration that was deployed can be viewed in XML format by clicking **View Deployed Configuration**.

Figure 45 VMready Log Viewer



Advanced Configuration and Tuning

This section provides information about parameters that you can modify in the Switch Center configuration files. You must connect to the Switch Center server via Telnet or a similar program. You perform advanced configuration and tuning tasks through a command-line interface.

The configuration files that are described in this section can be found as below:

- The config-substitutions.properties file is under the following directory: `/opt/ibm/snsc/webserver/var/conf/`
- The rest of the configuration files reside under the following directory: `/opt/ibm/snsc/conf`

Requirement: You must stop and restart Switch Center services before any configuration file changes can take effect.

Modifying the log.properties Configuration File

The `log.properties` file contains logging-specific properties that you can configure.

Table 21 log.properties file property descriptions

Property Name	Description
TimeStampFormat	This property defines the format of the timestamp used in the log files. To change the timestamp format to different value, see the JDK SimpleDateFormat API document, which provides a list of available formats. Default=`dd MMM yyyy HH:mm:ss.`
LogFileMaxSizeKB	This parameter defines the maximum log file size in kBytes. If the contents exceed this limit, the file is backed up using a roll number, for example, <*logfile*>.1.log). Default maximum log file size = 1024, which equals 1 MB.
MaxBackupFiles	This parameter defines the maximum number of backup log files that SNSC can store. For example, if this value is ten, then SNSC keeps a maximum of ten backup files. The backup files use the filename format of <*logfile*>.1.log to <*logfile*>.10.log. Ten is the default value for the maximum number of backup files.

Modifying the server_config.properties Configuration File

The `server_conf.properties` file contains Switch Center server-specific parameters that you can configure.

Table 22 server_conf.properties file property descriptions

Property Name	Description
rmi_port	The `rmi_port` is the port on which the SNSC server and client exchange information. Default value=`40999`
cmi_timeout	The `cmi_timeout` parameter is the timeout, in milliseconds, that SNSC uses to communicate with devices. Default value=`5000`, which is five seconds.
session_timeout	The `session_timeout` parameter defines the timeout, in seconds. that SNSC uses to automatically log you out of an inactive browser session when you are connected to SNSC. Default value=`57600`
snmp_trap_service	When the `snmp_trap_service` parameter is set to true, SNSC runs the trap listener on the specified trap port. Default value=`true`
syslog_service	When the `syslog_service` parameter it is set to true, SNSC runs the syslog listener on the specified syslog port. Default value=`true`
snmp_trap_port	The `snmp_trap_port` defines the port on which SNSC listens to receive the traps. The `snmp_trap_port` only applies if the `snmp_trap_service` parameter is set to true. Default value=`162`
syslog_port	The `syslog_port` parameter defines the port on which SNSC listens to receive the syslog messages. The `syslog_port` parameter applies only if syslog_service is set to true. Default value=`514`
Group_operation_status_poll_intr	The polling interval to check the status of group operations like image upgrade or backup that are in progress. Default value = 10s

Modifying the backup.properties Configuration File

The `backup.properties` file contains event backup (DB purge) parameters and Critical Data Backup parameters.

Table 23 backup.properties file property descriptions

Property Name	Description
TimeStampFormat	This parameter defines the format of the timestamp used when SNSC saves purged events in a text file. To change the `TimeStampFormat` to a different value, see the JDK SimpleDateFormat API document. The API document provides a list of available formats. Default format=`ddMMMyyyy_HHmmss`
DataBackupMaxWaitTime	The maximum time in minutes that Data Backup Operation waits for operation to complete.
DBPurgeDirectory	The directory (NFS or remote mounted) where the purged data files are stored.
DataBackupDirectory	The directory (it could be NFS/Remote mounted) where the data backup file should be stored during data backup operation. **Note**: This parameter can also be updated using menu **Maintenance > Data Backup > Set Data Backup Directory**.

Modifying the config-substitutions.properties Configuration File

The config-substitutions.propertiesfile contains Switch Center Web server configuration parameters that you can modify. The file is installed in the following directory:

```
/opt/ibm/snsc/webserver/var/conf/
```

Table 24 config-substitutions.properties file property descriptions

Property Name	Description
HTTPPort=40080	This parameter defines the HTTP port on which the SNSC Web server listens for HTTP requests. Default value=40080.
HTTPSPort=40443	This parameter defines the HTTPs (SSL) port on which the SNSC Web server listens for HTTPs requests. Default value=40443.

Modifying the alertseverity.properties Configuration File

Switch Center uses the `alertseverity.properties` file as a reference for assigning severity to generated SNSC Alerts. This property file contains all the alert types generated by Switch Center, along with severity. If you want to change the default severity, edit this file with the new severity. The severity can be one of the following: `CRITICAL`, `MAJOR`, `MINOR`, `WARNING`, or `INFORMATIONAL`.

Modifying the cmi.properties Configuration file

Switch Center uses `cmi.properties` to set the timeout value for handling Table specific responses. You can configure the timeout value to suit the environment depending on the network speed.

How to Manually Set Device Discovery Date

By default, Switch Center assigns the current date after discovering a device. The discovery date parameter helps you to filter the devices based on date range (see “Discovery Time Range Summary Pane” on page 69). Though Switch Center assigns the discovery date automatically, but you can override that and specify a different date manually using the following steps:

1. Select a switch from the Switch Center Device List page (see Figure 9 on page 74).
2. Choose **Device > Set Discovery Date**.
3. Click the date icon to bring up the date wizard and click the date.
4. If Root user is enabled, enter the root password.
5. Click **Save**.

You can also set the discovery date on more than one switch at a time using the below steps:

1. Select one or more switches from the Switch Center Device List page (see Figure 9 on page 74).
2. Choose **Group Operations > Set Discovery Date**.
3. Click the date icon to bring up the date wizard and click the date.
4. If Root user is enabled, enter the root password.
5. Click **Save**.

How to Configure Discovery Time Range

The Discovery Time Ranges control how the device counts are shown in Discovery Time Range Summary Page (see “Discovery Time Range Summary Pane” on page 69) and how the devices are filtered.

1. Choose menu **Options > Discovery Time Range Configuration**.
2. Change Less Than (<) and Greater Than (>) settings.
3. If Root user is enabled, enter the root password.
4. Click **Save**.

Viewing Reports

You can view various reports associated with all the discovered switches by choosing the items under the **Reports** menu in Switch Center (SNSC).

How to View the Event List Report

The Event list is a summary of events about all discovered switches. You can control how the report organizes and presents information (see “How to Customize Information in Reports” on page 178). To view the Event List report:

1. Click **Reports > Event List**.
2. Use the Page text box or associated arrow buttons to navigate through the available pages.
3. To view the details of an event, double-click any event row or select a row and click **View Details**.
4. To delete one or more events from the Switch Center database:
   a. Click the box next to Node.
   b. Click **Delete** to remove the selected events from the database.
5. Click **Close** to return to the Switch Center home page.

Figure 46 Event List ReportSNSC Alerts Report Window

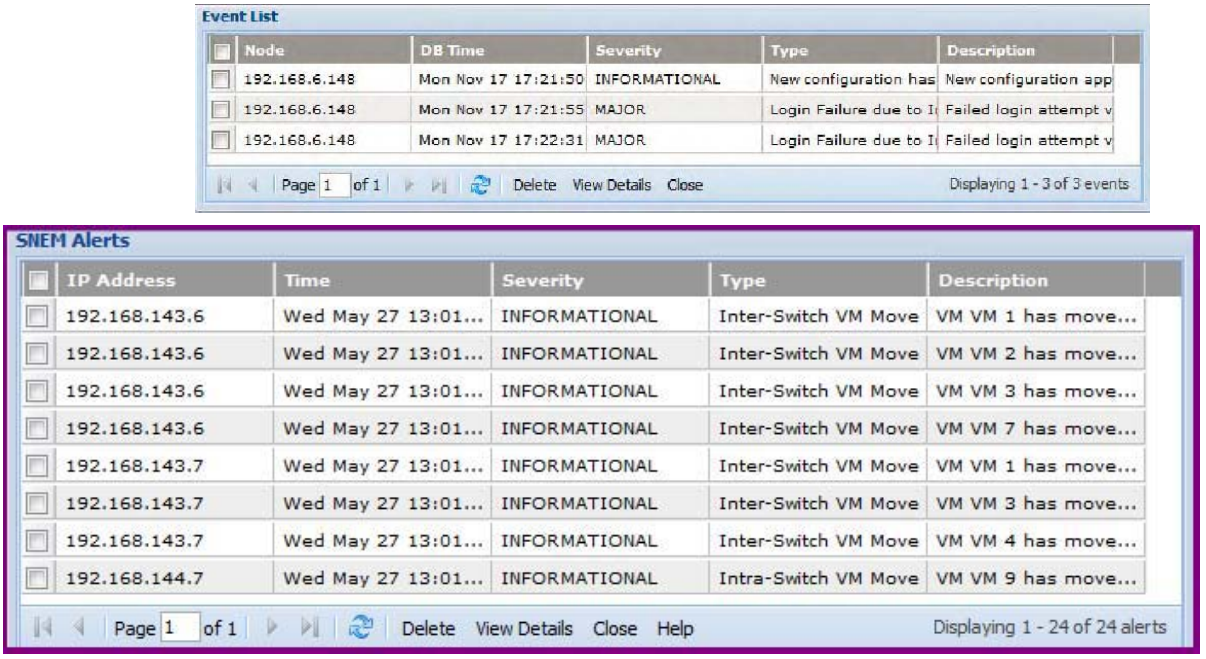


Figure 47

Table 25 Event List Report field descriptions

Field	Description
Node	IP address of the device that sent the message.
DB Time	The time that the message was received at the server and placed into the SNSC database.
Severity	The severity of the trap as defined in the `trapseverity.properties` file. See “Advanced Configuration and Tuning” on page 149.
Type	The trap type, which is included in the event from the device. The device defines the trap type.
Description	The text that was included in the message from the sending device.

How to View the Syslog List Report

The Syslog list is a summary of syslogs received from the discovered switches. You can control how the report organizes and presents information (see “How to Customize Information in Reports” on page 178). To view the Syslog List report:

1. Click **Reports > S;yslog List**.
2. Use the Page text box or associated arrow buttons to navigate through the available pages.
3. To view the details of a syslog message, double-click any event row or select a row and click **View Details**.
4. To delete one or more syslog entries from the Switch Center database:
   a. Click the box next to Node.
   b. Click **Delete** to remove the selected events from the database.
5. Click **Close** to return to the Switch Center home page.

Figure 48 Syslog List ReportSNSC Alerts Report Window

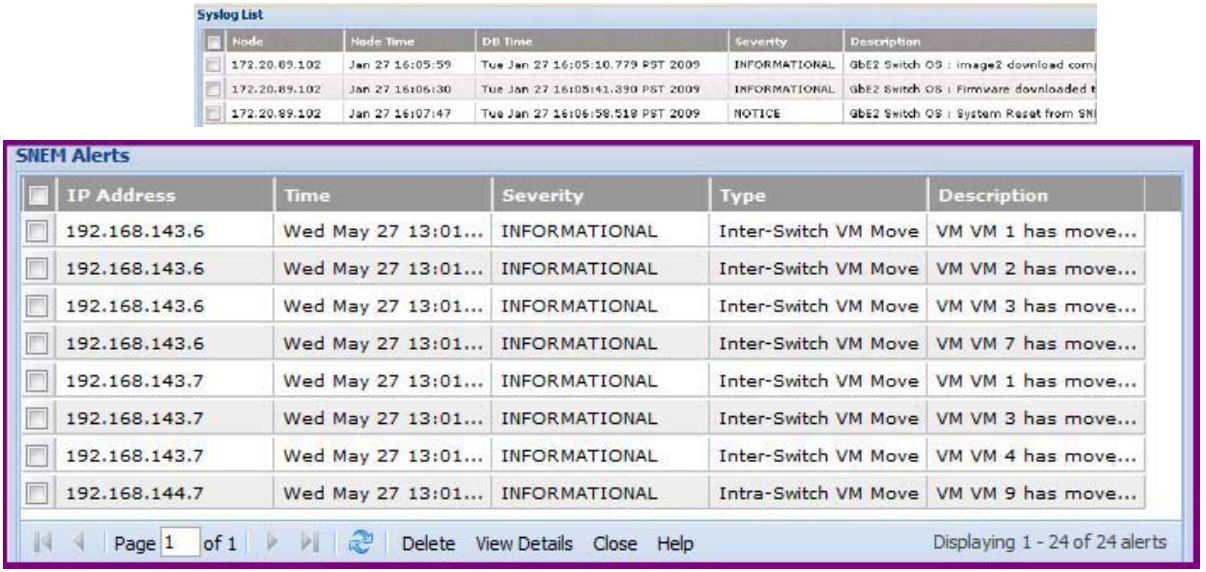


Figure 49

Table 26 Syslog List Report field descriptions

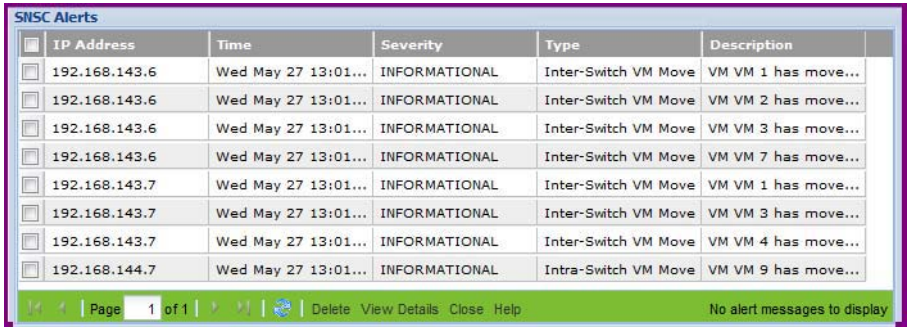
Field	Description
Node	IP address of the device that sent the message.
DB Time	The time that the message was received at the server and placed into the SNSC database.
Severity	EMERG - indicates the system is unusable. ALERT - indicates action should be taken immediately. CRIT - indicates critical conditions. ERR - indicates error conditions or eroded operations. WARNING - indicates warning conditions. NOTICE - indicates a normal but significant condition. INFO - indicates an information message. DEBUG - indicates a debug-level message.
Description	The text that was included in the message from the sending device.

How to View the SNSC Alerts Report

The SNSC Alerts list is a summary of internal alerts generated by Switch Center when it detects intra-switch or inter-switch Virtual Machine movements with reference to switches. To view the SNSC Alerts report:

1. Click **Reports > SNSC Alerts** (see Figure 46 on page 161).
2. Use the Page text box or associated arrow buttons to navigate through the available pages.
3. To view the details of an alert, double-click any alert row or select a row and click **View Details**.
4. To delete one or more Switch Center alerts entries from the Switch Center database:
   a. Click the box next to Node.
   b. Click **Delete** to remove the selected alerts from the database.
5. Click **Close** to return to the Switch Center home page.

Figure 50 Switch Center Alerts ReportSNSC Alerts Report Window



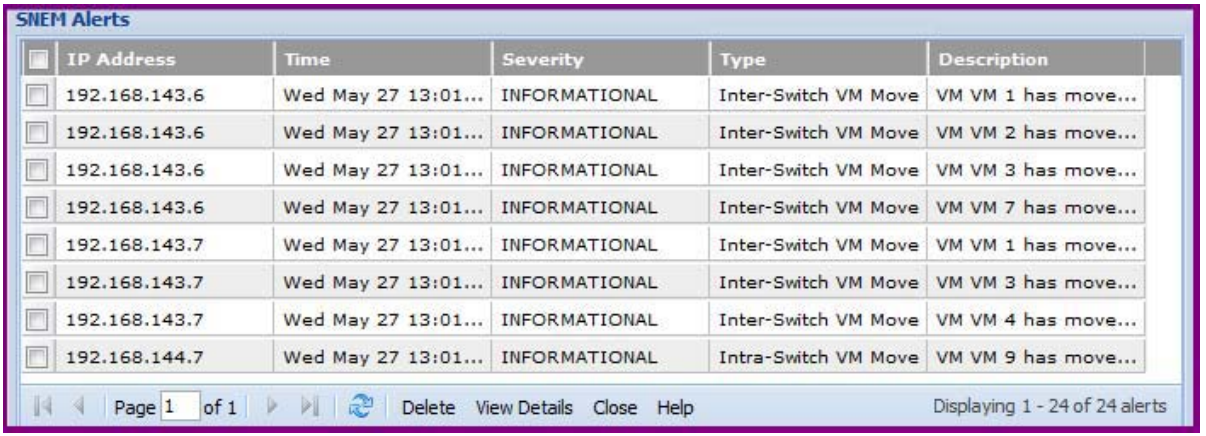


Figure 51

Table 27 Switch Center Alerts Report field descriptions

Field	Description
IP Address	IP address of the switch that resulted in Switch Center Alert
Time	The time that the alert was generated by Switch Center.
Severity	The severity of the alert as defined in alertseverity.properties file. See “Advanced Configuration and Tuning” on page 149 for customization.
Type	The alert type
Description	The alert description

Table 28 Switch Center Alerts descriptions

Field	Description
VM <*name/MAC address*> came online on port <#>	*Intra-switch alert* When Switch Center detects a VM is on a non-zero port that was previously on port 0 of the same switch and not on a non-zero port of another switch.
VM <*name/MAC address*> came online on port <#> from <*switch address*>, port <#>	*Inter-switch alert* When Switch Center detects a VM is on a non-zero port on a switch which was previously on a non-zero port of another switch.
VM <*name/MAC address*> returned to pre-provisioned state from port <#>	*Intra-switch alert* When Switch Center detects a VM is on port 0 that was previously on a non-zero port on the same switch.
VM <*name/MAC address*> has moved from port <#> to <#>	*Intra-switch alert* When Switch Center detects a VM has moved from one port to another port on the same switch.
VM <*name/MAC address*> has moved from port <#> to <*switch address*>, port <#>	*Inter-switch alert* When Switch Center detects a VM has moved from one port to another port on a different switch.

How to View the Switch Version Report

The switch version report is a summary of data about all discovered switches (**Reports > Switch Version Report**) or selected discovered switches (**Group Operations > Switch Version Report**). You can control how the report organizes and presents information (see “How to Customize Information in Reports” on page 178).

1. Click **Reports > Switch Version Report** or **Group Operations > Switch Version Report** (see Figure 52 on page 167).
2. Click **Refresh** to update the version of the report that you are viewing.
3. Click **Close** to return to the Switch Center home page.

Figure 52 Switch Version Report window

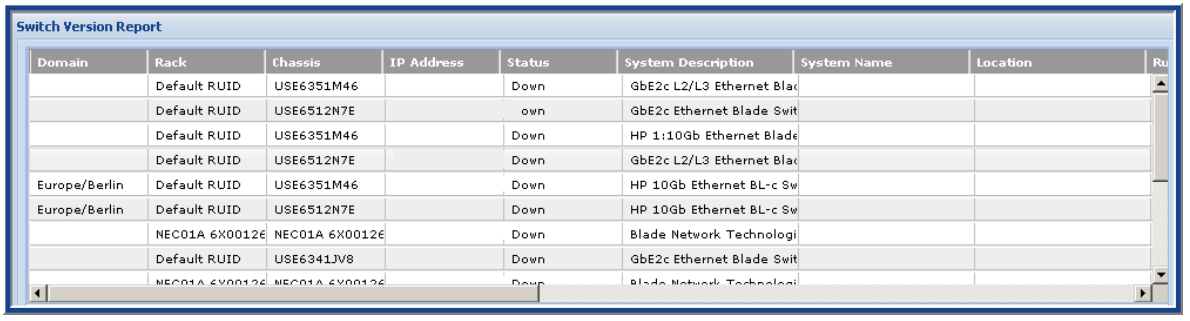


Table 29 Switch Version Report field descriptions

Field	Description
Domain	Names of all switch domains.
Rack	The Rack name (in the navigation tree) in which the switch is contained
Chassis	The Chassis name (in the navigation tree) in which the switch is contained
IP Address	The IP address of the switch.
Status	Status showing whether the switch is currently up or down.
System Description	Displays the product name of the switch.
System Name	The administrative-assigned name for the switch.
Discovery Date	The date of the switch discovery.
Location	The physical location of the switch.
Image1	The software version of the image stored in the first image storage area.

Table 29 Switch Version Report field descriptions (continued)

Field	Description
Image2	The software version of the image stored in the second image storage area.
Boot Version	The software version of the switch boot code.
Running Software Version	The version of the software image that is currently running on the system.
Hardware Serial Number	The hardware serial number of the switch.
Config For Next Reset	Gives the configuration to choose for the next switch reset.
Save Pending	Gives information whether any applied changes are not yet saved to FLASH memory on the switch.
Module Bay	The module bay in which the switch is installed.
Manufacture Date	Date the device was manufactured.
Enabled Software Features	Gives information about the enabled software features.
Panic Dump	Gives panic dump status.
Time and Reason for last boot	Gives information about the last reboot cycle. For example, the reason might be power cycle.

How to View the Transceiver Information Report

The transceiver information report is a summary of port transceiver information of switches with 10G ports. To view Transceiver Information report:

1. Choose menu **Reports > Transceiver Information Report** to view the report of all discovered switches with 10G ports, or choose menu **Group Operations > Transceiver Information Report** to view the report of the selected switches with 10G ports (see Figure 53 on page 169).
2. Click **Refresh** to update the report that you are viewing.
3. Click **Close** to return to the Switch Center home page.

Figure 53 Transceiver Information Report

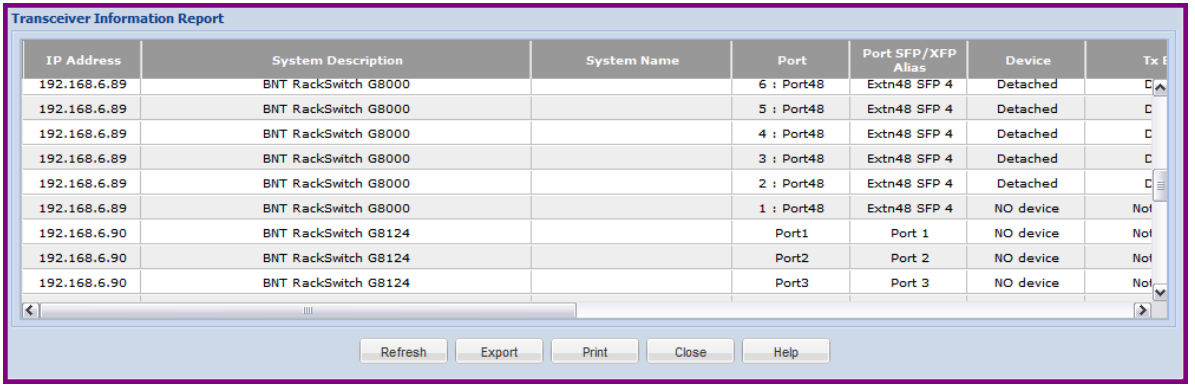


Table 30 Transceiver Information Report field descriptions

Field	Description
IP Address	IP address of the switch.
System Description	Product name of the switch.
System Name	Administrative-assigned name for the switch.
Port	Port index number
Port SFP/XFP Alias	10G SFP/XFP port alias
Device	Device name. “NO device” indicates device/cable is not connected.
Tx Enable	TX-Enable status
Rx Signal	RX-Signal status
Tx Fault	TX-Fault status
Vendor	Vendor name for the device

Table 30 Transceiver Information Report field descriptions (continued)

Field	Description
Serial Number	Serial number of the device
Approval	Approval state for the device: (i) Not Installed (ii) Not Approved (iii) Approved (iv) Detached

How to View the VM Data Center Report

The VM Data Center Report is a list of virtual machines (VMs) that match the following criteria:

- MAC address has been discovered on a server (downlink) port of a switch, and
- MAC address is found in one of the configured VM Management Servers.

At least one VM Management Server must be configured that contains information about the VMs whose MAC addresses will be discovered on the switches.

For RackSwitches (for example, G8124), you must define which ports are server ports in order for the VMs to be reported properly.

To launch the VM Data Center Report, choose menu **Reports > VM Data Center Report** or **Group Operations > VM Data Center Report** (see Figure 54).

Figure 54 VM Data Center Report

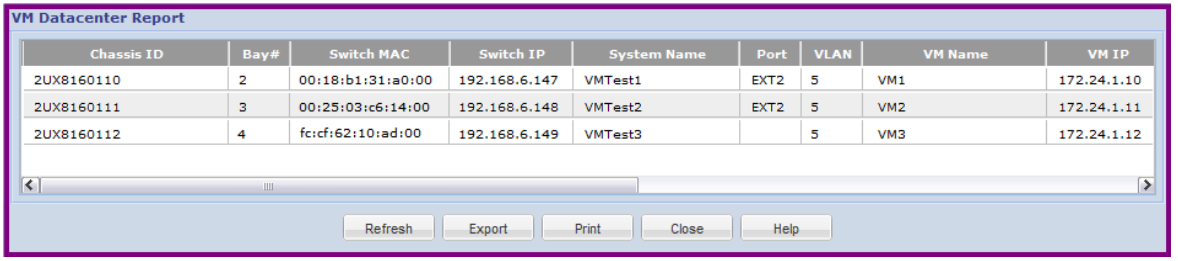


Table 31 VM Data Center Report field descriptions

Field	Description
Chassis ID	The chassis ID of the switch. This is relevant only in case of stack of switches.
Bay #	The bay number in which the switch is residing. This is relevant only in case of stack of switches.
Switch MAC	MAC Address of the switch on which the VM was discovered.
Switch IP	IP Address of the switch on which the VM was discovered.
System Name	Name of the switch on which the VM was discovered.
Port	Server port on which Virtual Machine was discovered.
VLAN	VLAN to which the Virtual Machine is associated.
VM Name	Name of the discovered virtual machine. This information is retrieved from VMWare vCenter.

Table 31 VM Data Center Report field descriptions

Field	Description
VM IP	IP Address of the Virtual Machine. This information is retrieved from VMWare vCenter.
VM vNIC	vNIC address of the Virtual Machine. This information is retrieved from VMWare vCenter.
PortGroup/VLAN	PortGroup and VLAN of Virtual Machine as configured in the hypervisor. This information is retrieved from VMWare vCenter.
Hypervisor	Name of the Hypervisor on which the VM is running. This information is retrieved from VMWare vCenter.

How to View the VMready VM Report

There are two types of VMready VM Reports, as follows:

- VM Groups: Reports the membership of the Virtual Machine Groups that are configured on each of the discovered VMready capable switches. The VM Groups Report provides a summary of all Virtual Machines discovered by the switches listed in Switch Center.
- Port Groups: Reports the membership of the Port Groups that are configured on each of the discovered VMready capable switches.

VMready VM Report – VM Groups

To launch the VM Groups Report, choose menu **Reports > VMready VM Report > VM Groups** (see Figure 55).

Figure 55 VMready VM Report – VM Groups window

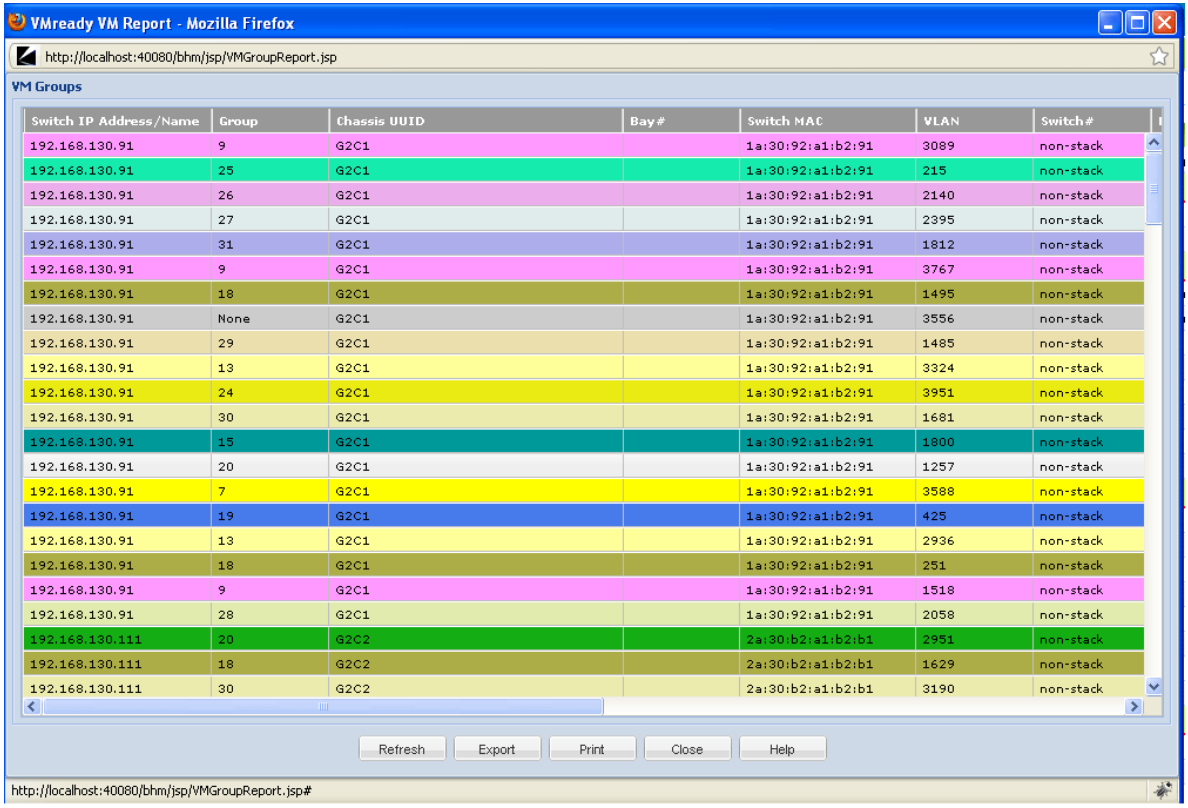


Table 32 VMready VM Report – VM Groups field descriptions

Field	Description
Switch IP Address/ Name	IP Address/Name of the switch on which the VM was discovered.
Groups	Group number to which the Virtual Machine is associated.
Chassis UUID	The chassis UUID of the switch. This is relevant only in case of stack of switches.
Bay #	The bay number in which the switch is residing. This is relevant only in case of stack of switches.

Table 32 VMready VM Report – VM Groups field descriptions

Field	Description
Switch MAC	MAC address of the switch.
VLAN	VLAN to which the Virtual Machine is associated.
Switch #	Switch number of the corresponding uplink or server ports if the switch is part of a stack. • **non-stack** indicates the switch is not part of a stack. • **(Detached)** indicates the switch is configured as part of a stack, but is not physically present at the time.
Port	Server port on which Virtual Machine was discovered.
Virtual MAC	MAC address of the Virtual Machine.
VM IP	IP Address of the Virtual Machine.
VM Name	Name of the discovered virtual machine. If the VM Management Server Connector is not configured, this field is blank.
Hypervisor	Name of the Hypervisor on which the VM is running. If the VM Management Server Connector is not configured, this field is blank.

VMready VM Report – Port Groups

To launch the Port Groups Report, choose menu **Reports > VMready VM Report > Port Groups** (see Figure 56).

Figure 56 VMready VM Report – Port Groups window

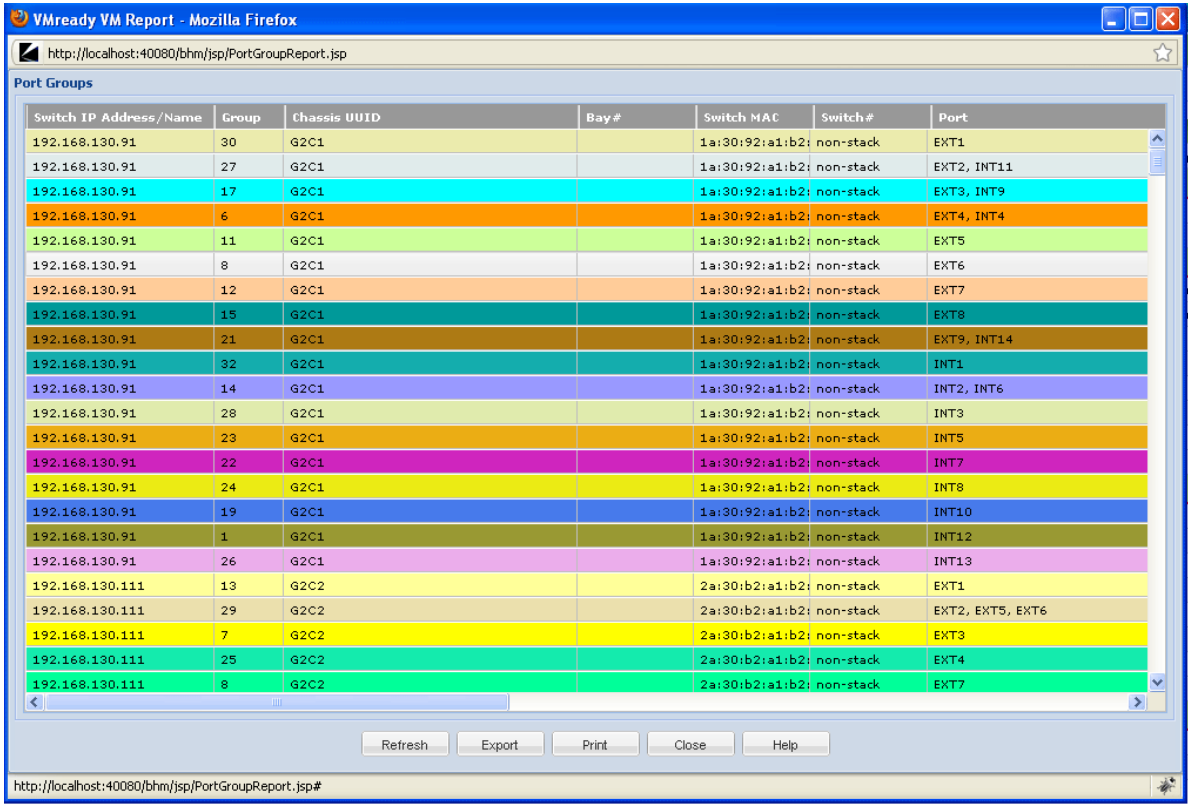


Table 33 VMready VM Report — Port Groups field descriptions

Field	Description
Switch IP Address/ Name	IP Address/Name of the switch.
Groups	Group number to which the uplink or server ports are associated.
Chassis UUID	The chassis UUID of the switch. This is relevant only in case of stack of switches.
Bay #	The bay number in which the switch is residing. This is relevant only in case of stack of switches.

Table 33 VMready VM Report — Port Groups field descriptions

Field	Description
Switch MAC	MAC address of the switch.
Switch #	Switch number of the corresponding uplink or server ports if the switch is part of a stack. • **non-stack** indicates the switch is not part of a stack. • **(Detached)** indicates the switch is configured as part of a stack, but is not physically present at the time.
Port	Alias of uplink or server ports.

How to Customize Information in Reports

This section explains how to customize information displayed in the Switch Version Report and Event List window.

Changing the Column Sort Order

1. Click a column heading.
2. Click **Sort Ascending** to sort information in ascending order.
3. Click **Sort Descending** to sort information in descending order.

Displaying or Hiding Columns

1. Click a column heading.
2. Click **Columns**.
3. Clear column names to hide one or more columns.
4. Click column names to display one or more columns.

Performing Group Operations

You typically perform group operations on multiple switches of the same type.

Restriction: The Concurrent Limit setting (see **Options > General Properties**) controls the number of switches on which System Networking Switch Center (SNSC) can simultaneously perform group operations. For example, if the Concurrent Limit parameter is set to 10, Switch Center can perform actions on a maximum of 10 switches at the same time. See "Changing the Default General Properties" on page 101 to change the general properties.

How to Deploy Switch Image and Configuration on One or More Switches

You can deploy switch image (firmware) or configuration on one or more selected switches through group operations. In addition to deploying them, you can backup firmware and/or configuration from multiple switches and download panic dump, tech support dump from multiple switches. These group operations can be initiated to take effect immediately or can be configured to occur at a scheduled time.

Prerequisite: You must configure an FTP, TFTP, or SFTP server before you can perform most group operations. When you perform a task that involves an FTP, TFTP, or SFTP server, Switch Center displays information about the server, such as transfer mode and IP address. See "Configuring FTP/SFTP/TFTP Server Parameters" on page 114 to set up the server.

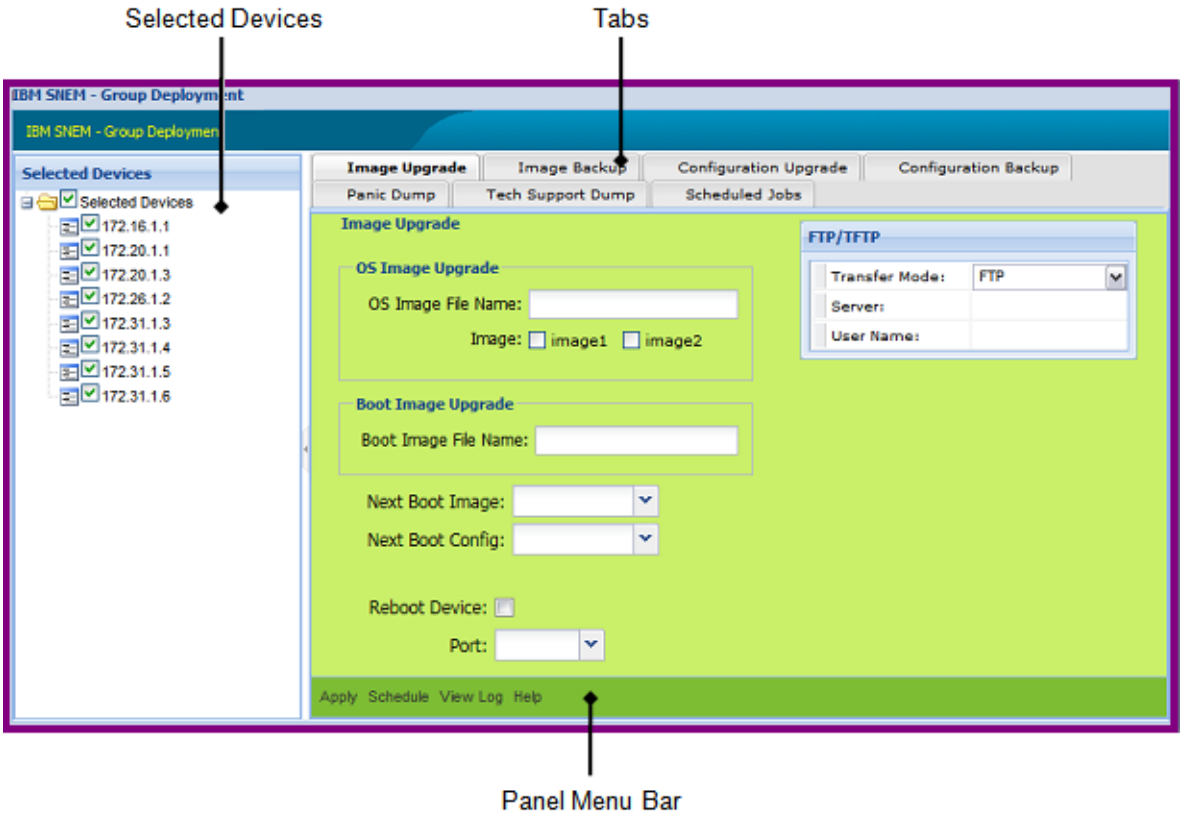
To launch Group Deployment page:

- Select one or more switches in the device list (see Figure 6 on page 63).
- Choose any one option under menu **Group Operations > Deployment**.

The Group Deployment page (see Figure 57 on page 183) consists of two framed windows: the Selected Devices frame (left) and the Content Frame (right).

The Selected Devices frame lists the selected switches for which the group operation is going to be performed. It also allows you to deselect any switches from the selection list. The Content frame shows the sub-features in the form of tabs and the corresponding details in a panel along with panel specific menu bar at the bottom.

Figure 57 IBM System Networking Switch Center – Group Deployment Page



How to Upgrade Switch Image on One or More Switches

You can upgrade the switch image (firmware) on one or more switches of the same type by using this feature.

1. Log in to Switch Center as an administrator.
2. Select one or more switches of the same type from the Switch Center Device List page. You can make use of List Device(s) filter in the Device List page to select a particular type of switch.
3. Choose menu **Group Operations > Deployment > Image Upgrade** to launch Image Upgrade window.
4. Enter the name of the switch OS image in the OS Image File Name field. This switch OS image must reside on the FTP/SFTP/TFTP Server.
   a. Choose `image1` if you want the switch OS image in image 1 slot on the switch.
   b. Choose `image2` if you want the switch OS image in image 2 slot on the switch.
5. Enter the name of the switch boot image in Boot Image File Name field. This switch boot image must reside on the FTP/SFTP/TFTP Server.
6. (Optional) Choose **Next Boot Image** if you want to load a different OS image during next boot.
7. (Optional) Choose **Next Boot Config** if you want to load a different configuration during next boot.
8. Choose **Reboot Device** if you want the new image files to take effect. If you select **Reboot Device**, then Image Upgrade operation will reset the switch after upgrading the switch images. This operation interrupts service on the selected switches.
9. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
10. Click **Apply** to immediately copy the image file to the selected switches.
11. (Optional) Click **Schedule** to set the parameters required to copy the image file to the selected switches at a later time.
    a. Enter the schedule name of the job.
    b. Select a job type.
    c. Enter the date to start the job.
    d. Enter the hour and minute to start the job.
    e. Click **Schedule**.

f To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.

12 Click **View Log** to open a window that displays information about the procedure.

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Backup Switch Image from One or More Switches

You can backup the switch image (firmware) from one or more switches by using this feature.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the System Networking Switch Center Device List page.
3. Choose menu **Group Operations > Deployment > Image Backup** to launch Image Backup window.
4. Select the image type to backup from Image list.
5. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
6. Select the transfer mode – FTP, TFTP, or SFTP.
7. Click **Apply** to immediately start the image backup process.
8. (Optional) Click **Schedule** to set the parameters required to backup the image file from the selected switches at a later time.
   a. Enter the schedule name of the job.
   b. Select a job type.
   c. Enter the date to start the job.
   d. Enter the hour and minute to start the job.
   e. Click **Schedule**.
   f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
9. Click **View Log** to open a window that displays information about the procedure.

The default image backup file stored on FTP/SFTP/TFTP server is in the following format:

```
<IPAddress>_ddMMMyyyy_HHmmss.img
```

For example, the image backed up from the switch 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named as follows:

```
192.168.1.1_07Mar2008_235901.img
```

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Upgrade Switch Configuration on One or More Switches

You can upgrade the switch configuration on one or more switches of the same type by using this feature.

1. Log in to Switch Center as an administrator.
2. Select one or more switches of the same type from the System Networking Switch Center Device List page. You can make use of List Device(s) filter in the Device List page to select a particular type of switch.
3. Choose menu **Group Operations > Deployment > Configuration Upgrade** to launch Configuration Upgrade window.
4. Enter the name of the configuration file in Configuration File Name. This configuration file should be residing on the FTP/SFTP/TFTP Server.
5. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
6. Select the transfer mode – FTP, TFTP, or SFTP.
7. Click **Apply** to immediately copy the configuration file to the selected switches.
8. (Optional) Click **Schedule** to set the parameters required to copy the configuration file to the selected switches at a later time.
   a. Enter the schedule name of the job.
   b. Select a job type.
   c. Enter the date to start the job.
   d. Enter the hour and minute to start the job.
   e. Click **Schedule**.
   f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
9. Click **View Log** to open a window that displays information about the procedure.

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Backup Switch Configuration from One or More Switches

You can backup the switch configuration from one or more switches by using this feature.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the System Networking Switch Center Device List page.
3. Choose menu **Group Operations > Deployment > Configuration Backup** to launch Configuration Backup window.
4. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
5. Select the transfer mode – FTP, TFTP, or SFTP.
6. Click **Apply** to immediately start the configuration backup process.
7. (Optional) Click **Schedule** to set the parameters required to backup the configuration from the selected switches at a later time.
   a. Enter the schedule name of the job.
   b. Select a job type.
   c. Enter the date to start the job.
   d. Enter the hour and minute to start the job.
   e. Click **Schedule**.
   f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
8. Click **View Log** to open a window that displays information about the procedure.

The configuration file that you backed up is stored on FTP/SFTP/TFTP server in the following format:

```
config_<IPAddress>_ddMMMyyyy_HHmmss.txt
```

For example, the configuration file backed up from the switch 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named as follows:

```
config_192.168.1.1_07Mar2008_235901.txt
```

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Download Panic Dump from One or More Switches

When a switch encounters a fatal condition during runtime, it captures the current hardware and software state information into a panic dump. You can download the panic dump from one or more switches by using this feature.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the System Networking Switch Center Device List page.
3. Choose menu **Group Operations > Deployment > Panic Dump** to launch Panic Dump window.
4. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
5. Select the transfer mode – FTP, TFTP, or SFTP.
6. Click **Apply** to immediately start downloading the panic dump.
7. (Optional) Click **Schedule** to set the parameters required to download the panic dump from the selected switches at a later time.
   a. Enter the schedule name of the job.
   b. Select a job type.
   c. Enter the date to start the job.
   d. Enter the hour and minute to start the job.
   e. Click **Schedule**.
   f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
8. Click **View Log** to open a window that displays information about the procedure.

The panic dump is stored on FTP/SFTP/TFTP server in the following format:

`panicdump_<IPAddress>_ddMMMyyyy_HHmmss`

For example, the panic dump saved from the switch 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named as follows:

`panicdump_192.168.1.1_07Mar2008_235901`

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Download Tech Support Dump from One or More Switches

You can download the tech support dump from one or more switches by using this feature.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the Switch Center Device List page.
3. Choose menu **Group Operations > Deployment > Tech Support Dump** to launch Tech Support Dump window.
4. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
5. Select the transfer mode – FTP, TFTP, or SFTP.
6. Click **Apply** to immediately start downloading the tech support dump.
7. (Optional) Click **Schedule** to set the parameters required to download the tech support dump from the selected switches at a later time.
   a. Enter the schedule name of the job.
   b. Select a job type.
   c. Enter the date to start the job.
   d. Enter the hour and minute to start the job.
   e. Click **Schedule**.
   f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
8. Click **View Log** to open a window that displays information about the procedure.

The tech support dump is stored on FTP/SFTP/TFTP server in the following format:

```
tsdump_<IPAddress>_ddMMMyyyy_HHmmss
```

For example, the tech support dump saved from the switch 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named as follows:

```
tsdump_192.168.1.1_07Mar2008_235901
```

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to View Scheduled Jobs

You can view and refresh the list of scheduled jobs and you can cancel one or more scheduled jobs. You can see information about the job type, scheduled start date, ID of the person who scheduled the job and the job name.

1 Choose menu **Group Operations > Deployment > Scheduled Jobs** (see Figure 58 on page 191). The window displays all currently scheduled jobs.

2 Click **View Details** to bring up the window showing the details of the selected scheduled job.

3 To cancel one or more jobs:

   a Select the job or jobs that you want to cancel.

   b Click **Cancel Jobs**.

   c Click **Refresh** to verify that the scheduled jobs list does not displayed the cancelled jobs.

Figure 58 Scheduled Jobs pane

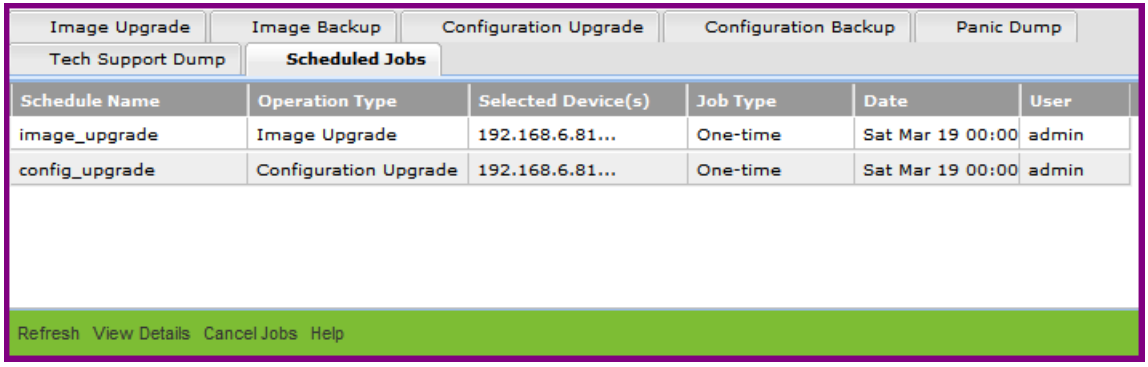


Table 34 Scheduled Jobs field descriptions

Field	Description
Schedule Name	Name of the scheduled job as created by the user.
Operation Type	The operation type, such as Image Upgrade, Image Backup, Configuration Upgrade, that is going to be performed by the scheduled job.
Selected Devices	The list of selected devices. Due to limited space, ellipsis is employed in case of multiple devices. But the list of all the selected devices can be seen by clicking **View Details** to open a window showing the details of the selected scheduled job.

Table 34 Scheduled Jobs field descriptions

Field	Description
Job Type	The type of the job. It can be: • One-time – Meaning it is executed once as scheduled • Recurrent – Recurring job occurring at regular interval
Date	The scheduled date and time information. In case of Recurrent type of jobs, a different tag such as Daily, Weekly and Monthly is used along with the time and/or date.
User	User who created the scheduled job.

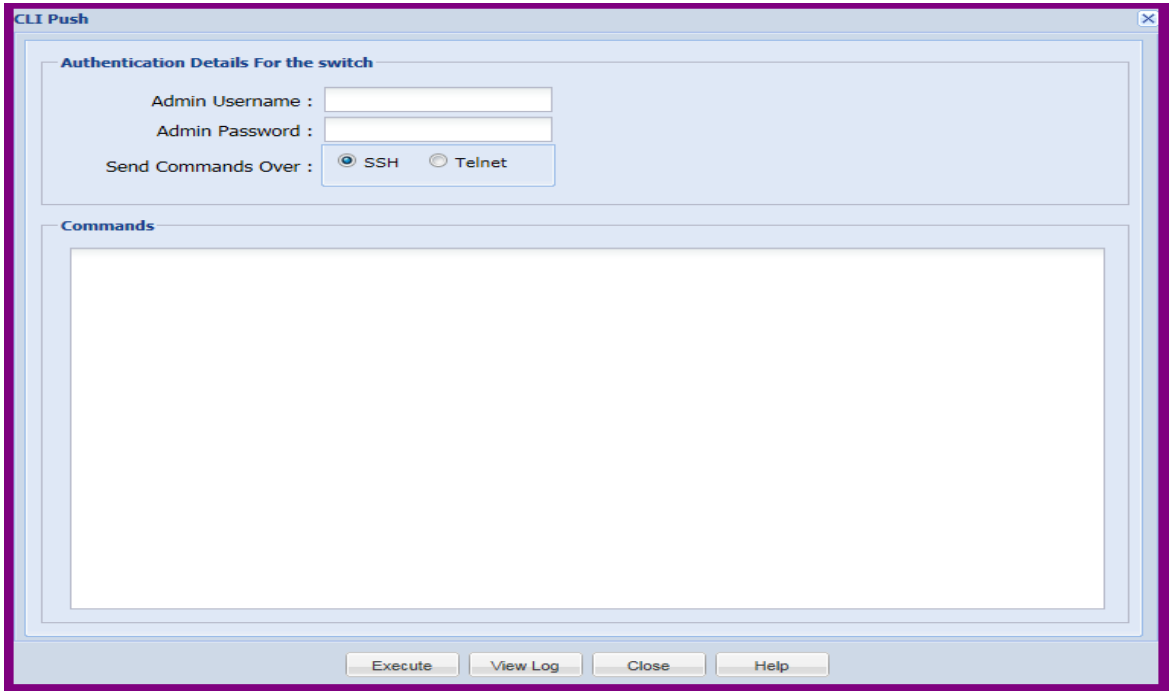
How to Run CLI Commands on One or More Switches

Using this facility, you can make changes to the switch configuration on multiple switches by executing one or more CLI commands. When you perform this operation, you must save the changes so that they are retained beyond the next time the switch is reset. When you execute the save command, your new configuration changes are placed in the active configuration block. The previous configuration is copied into the backup configuration block.

Note: Make sure that you enter complete commands, so no prompting for further user input is required.

1. Log in to Switch Center as an administrator.
2. Select one or more switches of the same type from the Switch Center Device List page. You can make use of List Device(s) filter in the Device List page to select a particular type of switch.
3. Choose menu **Group Operations > CLI Push** to launch the window (see Figure 59 on page 194).
4. Enter the Admin Username and Password of the switch.
5. Choose the protocol (SSH or Telnet) over which the CLI commands should be sent.
6. Enter one or more CLI commands.
7. (Optional) Click **View Log** to open the window to view the messages logged while performing CLI Push operation.
8. Click **Execute** to run the CLI commands on the selected switches.

Figure 59 CLI Push window



How to Collect Data from One or More Switches on Demand

You can asynchronously refresh the data of the selected switches.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the Switch Center Device List page.
3. Choose menu **Group Operations > Collect Data From Device**.

How to Retrieve Switch Version Report from One or More Switches

You can retrieve the switch version report from one or more switches.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the Switch Center Device List page.
3. Choose menu **Group Operations > Switch Version Report**.
4. For more information, refer to “How to View the Switch Version Report” on page 167.

How to Retrieve Transceiver Information Report from One or More Switches

You can retrieve the Transceiver Information report from one or more switches.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the Switch Center Device List page.
3. Choose menu **Group Operations > Transceiver Information Report**.
4. For more information, refer to “How to View the Transceiver Information Report” on page 169.

How to Retrieve VM Data Center Report from One or More Switches

You can retrieve the VM Data Center report from one or more switches.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the Switch Center Device List page.
3. Choose menu **Group Operations > VM Data Center Report**.
4. For more information, refer to “How to View the VM Data Center Report” on page 171.

How to Invoke Actions on One or More Switches

You can use this facility to invoke action commands such as **Apply**, **Save** on one or more switches.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the Switch Center Device List page.
3. To apply any pending configuration changes on the selected switches:
   a. Choose **Group Operations > Group Actions > Apply**.
   b. Click **Yes** to confirm that you want to apply the configuration on the selected switch(es).
4. To save the current configuration to the flash memory on the selected switches:
   a. Choose **Group Operations > Group Actions > Save**.
   b. Click **Yes** to confirm that you want to save the configuration on the selected switch(es).
5. To reboot the selected switches:
   a. Choose **Group Operations > Group Actions > Reboot Switch**.
   b. Click **Yes** to confirm that you want to reboot the selected switch(es).
6. To delete the selected switch entries from Switch Center device list:
   a. Choose **Group Operations > Group Actions > Delete**.
   b. Click **Yes** to confirm that you want to delete the selected switch(es).

Note: While invoking **Delete** operation, if you select one or members of a stack of switches, the entire stack will be deleted.

How to Manually Set Discovery Date on One or More Switches

You can manually set the discovery date on one or more switches.

1. Log in to Switch Center as an administrator.
2. Select one or more switches from the Switch Center Device List page.
3. Choose menu **Group Operations > Set Discovery Date**.
4. Click the date icon to open the Date wizard and click the date.
5. If Root user is enabled, enter the root password.
6. Click **Save**.

How to Add/Remove Notes to/from One or More Switches

You can add notes or remove notes from on one or more switches.

1. Log in to Switch Center as any valid user.
2. Select one or more switches from the Switch Center Device List page.
3. To add Notes:
   a. Choose menu **Group Operations > Notes > Add**.
   b. Type the text that you want to add.
   c. Click **OK**.
4. To remove Notes:
   a. Choose menu **Group Operations > Notes > Remove**.
   b. Click **Yes** in the confirmation dialog to remove notes.

Monitoring a Switch

The monitoring feature provides real-time information and statistics about various components of a selected switch. The monitoring facility is provided as part of the Device Console page in (see Figure 11 on page 88).

Choose menu **Options > Data Collection Configuration** to view or change the Performance Statistics interval parameter. The parameter determines how often performance statistics are collected from a device and written to the Switch Center (SNSC) database. Performance Statistics collection only occurs on a device when a user opens a monitoring page for that device. If no users have selected a monitor page, no performance statistics collection occurs on any discovered device.

Choose menu **Options > Refresh Configuration** to view or change the interval that determines how often the user interface is updated with new performance statistics from the database.

How to Monitor the Switch

You can launch **Device Console – Monitoring** page by choosing one of the following ways after you log in to Switch Center:

1. Log in to Switch Center.
2. Launch Device Console page. You can launch this page using one of the following approaches:
   - **a** Select a switch from the Switch Center Home page (see Figure 6 on page 63) and choose menu **Device > Monitor**.
   - **b** Click the IP address link of the switch you want to manage in device list table in the Home page.
   - **c** In Home page's Go To: text field, enter the IP address of the switch you want to manage and click the **Search** (Magnifying Glass) icon.
3. Select the category from Monitor's tab in the left frame.

When you select a category, it results in the display of tab associated content pane. For example, if you select Summary, the content pane shows the following sub-category in the form of tabs:

- Health Status
- Information
- Port Status
- Port Summary

You can select one of the sub-category tabs to view the specific details.

Using the Monitoring Buttons

Table 35 Button descriptions

Button	Description
Refresh	Statistics are refreshed automatically on a regular basis. Click **Refresh** to display updated values between the regular refresh intervals. Choose menu **Options > Refresh Configuration** to change the refresh intervals.
Export	You can export monitoring statistics to a spreadsheet in CSV (comma separated value) format. Choose menu **Export > Save** to create a .csv file that you can open in Microsoft Excel. See “How to Export a Statistical Summary” on page 381 for more information.
Print	Click to send the statistics to the printer. See “How to Print a Statistical Summary” on page 383 for more information.
Chart	This button is available for all statistics related pages, enabling you to launch a chart and plot values in real-time. See “How to Launch a Chart” on page 379 for more information.
Help	Click to launch context-sensitive help for the page that you are viewing.
Port	This button is only available when you monitor ports. Click to change the port that is being monitored. See “How to Monitor a Port” on page 234 for more information.
Clear Counter	Select this option to clear the counter values only on the user interface.
Clear Statistics	Select this option to clear the statistics on the switch and reset them to zero.

About Various Monitor Tabs

Some **Device Console > Monitor** tabs might not be available for the selected switch. Please disregard the corresponding information if it does not apply to your switch.

How to Modify a Statistical Monitoring Page

You can customize information displayed by the monitoring pages.

Changing the Column Sort Order

1. Click a column heading.
2. Click **Sort Ascending** to sort information in ascending order.
3. Click **Sort Descending** to sort information in descending order.

Displaying or Hiding Columns

1. Click a column heading.
2. Click **Columns**.
3. Clear column names to hide one or more columns.
4. Click column names to display one or more columns.

How to View Switch Summary

Select Monitor's **Summary** category to view Switch Summary information. This section covers the following switch summary topics:

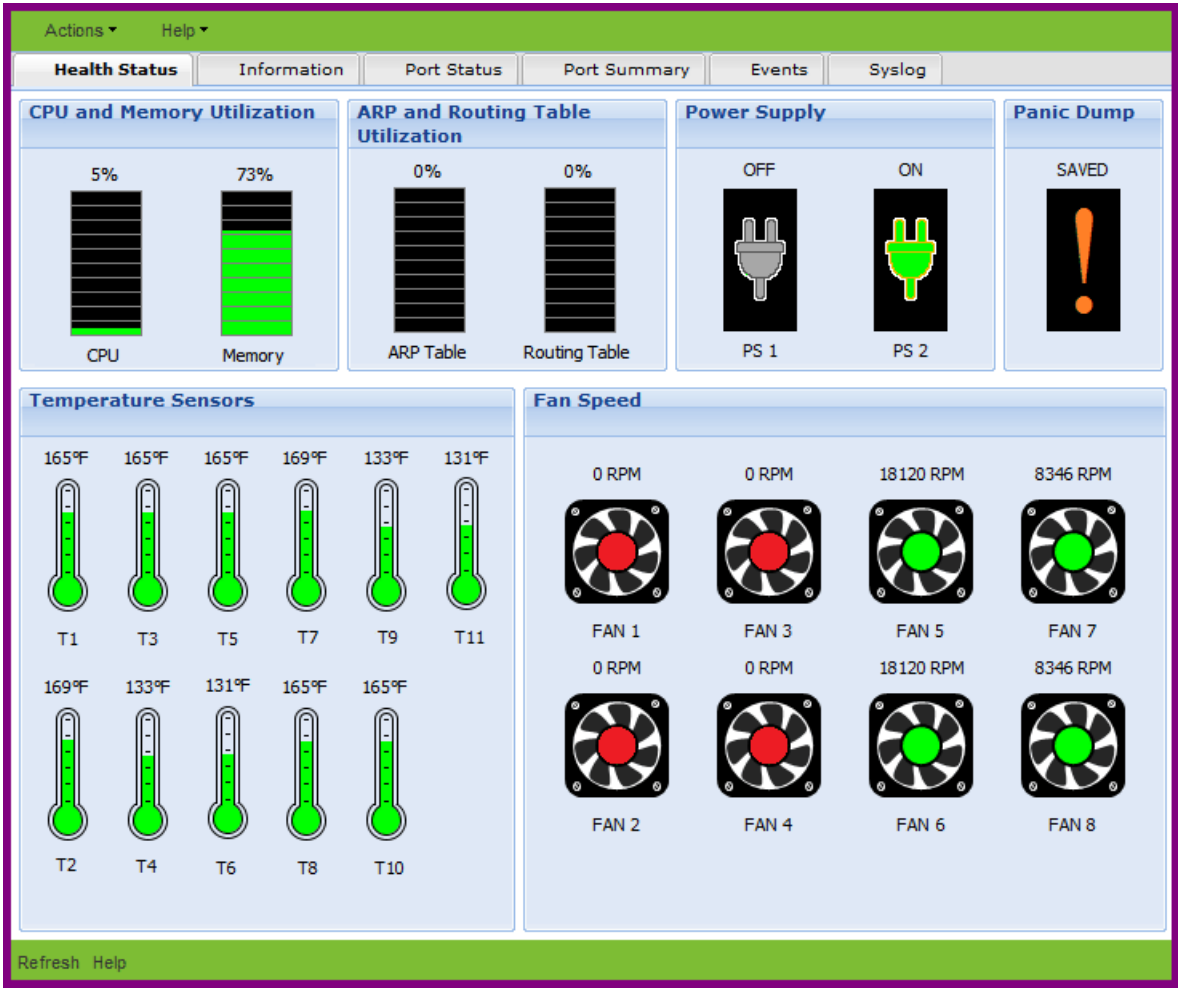
Viewing Health Status

Device Console > Monitor > Summary > *Health Status*

The Health Status page pictorially shows CPU and Memory Utilization, ARP and Routing Table Utilization, Power Supply Status, Panic Dump Status, Temperature Sensors reading and Fan Speed (see Figure 60 on page 212).

Note: The utilization, power supply status, temperature sensors and fan speed might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Figure 60 Health Status Window



Viewing Information

Device Console > Monitor > Summary > *Information*

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 36 Switch Information field descriptions

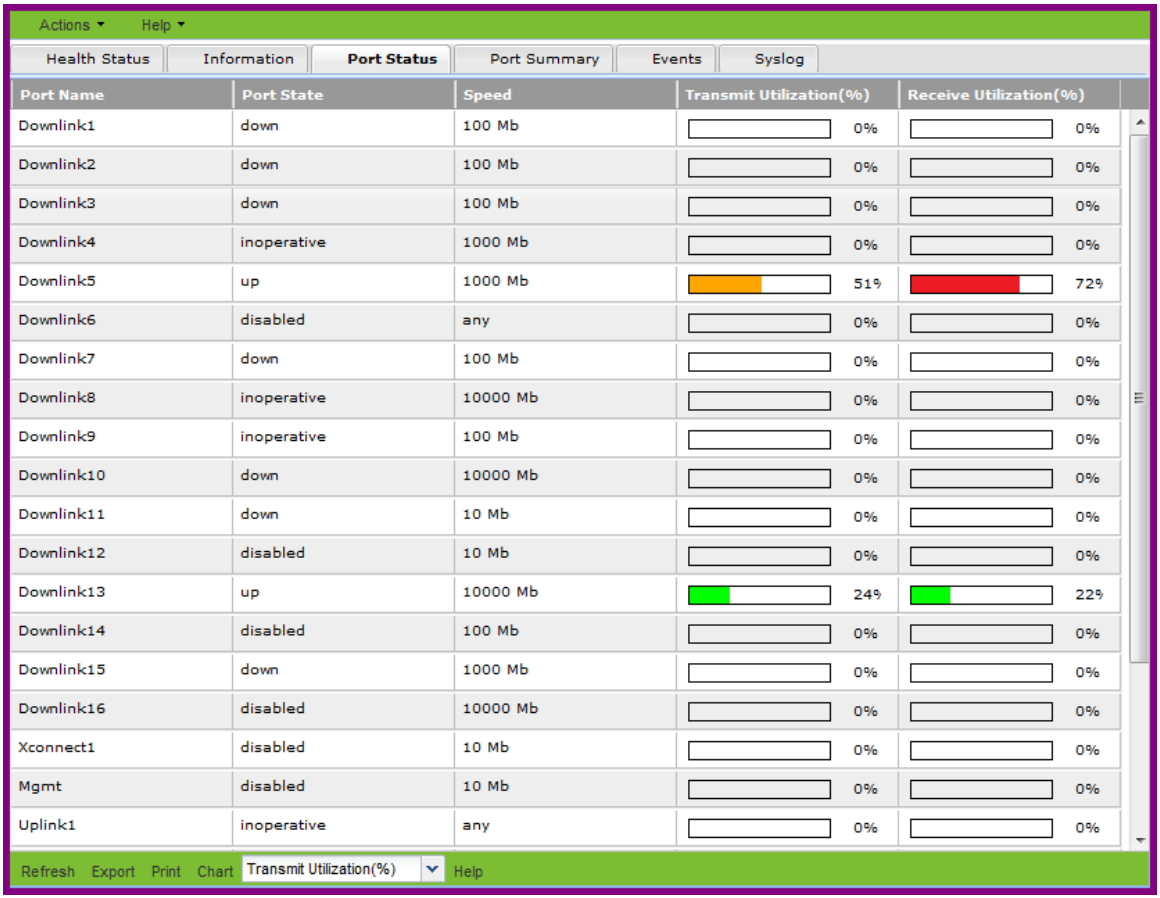
Field	Description
System Description	Displays the product name of the switch.
MAC Address	MAC address of the switch.
System Up Since	Displays the date and time when the switch was last booted.
Location	The physical location of the node, such as telephone closet, third floor.
Contact	Information about the contact person for this managed node.
Boot Code Version	The software version of the switch boot code.
Image 1 Software Version	The software version of the image stored in the first image storage area.
Image 2 Software Version	The software version of the image stored in the second image storage area.
Current Image	The software image that is active (image1 or image2).
Current Config	The current configuration block (active, backup, factory).
Primary Server Key	The NTP Authentication primary server key.
Secondary Server Key	The NTP Authentication secondary server key.
NTP Authentication State	The NTP Authentication state. A value of 1 means Enabled; a value of 0 means Disabled.
Enabled Software Features	The software features that are enabled on the switch.

Viewing Port Status

Device Console > Monitor > Summary > *Port Status*

The Port Status displays the state, speed and transmit and receive utilization corresponding to all the ports of the selected switch (see Figure 61 on page 214).

Figure 61 Port Status Window



Port Name	Port State	Speed	Transmit Utilization(%)	Receive Utilization(%)
Downlink1	down	100 Mb	0%	0%
Downlink2	down	100 Mb	0%	0%
Downlink3	down	100 Mb	0%	0%
Downlink4	inoperative	1000 Mb	0%	0%
Downlink5	up	1000 Mb	51%	72%
Downlink6	disabled	any	0%	0%
Downlink7	down	100 Mb	0%	0%
Downlink8	inoperative	10000 Mb	0%	0%
Downlink9	inoperative	100 Mb	0%	0%
Downlink10	down	10000 Mb	0%	0%
Downlink11	down	10 Mb	0%	0%
Downlink12	disabled	10 Mb	0%	0%
Downlink13	up	10000 Mb	24%	22%
Downlink14	disabled	100 Mb	0%	0%
Downlink15	down	1000 Mb	0%	0%
Downlink16	disabled	10000 Mb	0%	0%
Xconnect1	disabled	10 Mb	0%	0%
Mgmt	disabled	10 Mb	0%	0%
Uplink1	inoperative	any	0%	0%

Table 37 Port Status field descriptions

Field	Description
Port Name	The physical port of the switch
Port State	The port status

Table 37 Port Status field descriptions (continued)

Field	Description
Speed	The port speed
Transmit Utilization (%)	Transmission utilization in percentage (number of bytes sent out per speed)
Receive Utilization (%)	Receive utilization in percentage (number of bytes taken in per speed)

Viewing Port Summary

Device Console > Monitor > Summary > *Port Summary*

Table 38 Port Summary field descriptions

Field	Description
Port	Displays the port number. **Note**: The value will be in the following format if switch is connected to a stack: <Switch#> : <Port#/Port Alias>
Port Name	The port name defined by the administrator.
Speed	Displays the link speed.
Port State	Displays the current enabled or disabled value for the port link.
VLAN	A virtual local area network.
Tag PVID	Displays state of VLAN tag persistence. The default value is enabled, or "tagged". When disabled, or untagged, the VLAN tag is removed from packets where the VLAN tag matches the port PVID. The default value is enabled.
PVID	Displays the default VLAN number that is used to forward frames that are not VLAN tagged. The default number is 1.

Viewing Events

Device Console > Monitor > Summary > *Events*

Table 39 Events field descriptions

Field	Description
Node	IP address of the device that sent the event.
DB Time	The time that the event was received at the server and placed into the SNSC database.
Severity	The severity of the trap as defined in trapseverity.properties file. See “Advanced Configuration and Tuning” on page 149 for customization information.
Type	The trap type, which is included in the event from the device. The type is defined by the device.
Description	The text that was included in the event from the sending device.

Note 1: You can remove events from the Switch Center database by selecting the event(s) and by clicking **Delete**.

Note 2: You can view the details of an event including the SNMP variable bindings either by double-clicking any event row or by selecting a row and clicking **View Details**.

Viewing Syslog

Device Console > Monitor > Summary > *Syslog*

Table 40 Syslog field descriptions

Field	Description
Node	IP address of the device that sent the message.
Node Time	The time the message was generated by the device that sent it.
DB Time	The time that the message was received at the server and placed into the SNSC database.
Severity	Severity level, as follows: EMERG - indicates the system is unusable. ALERT - indicates action should be taken immediately. CRIT - indicates critical conditions. ERR - indicates error conditions or eroded operations. WARNING - indicates warning conditions. NOTICE - indicates a normal but significant condition. INFO - indicates an information message. DEBUG - indicates a debug-level message.
Description	The text that was included in the event from the sending device.

Note: To remove syslog messages from the Switch Center database, select the message(s) and click **Delete**.

Note: To view the details of a Syslog message, either double-click any event row or select a row and click **View Details**.

How to Monitor Switch Statistics

Select Monitor's **Switch** category to monitor Switch Statistics. This section covers the following switch statistics topics:

Note: Some of the monitor pages display Absolute Value, Average/sec, Minimum/sec, Maximum/sec and LastVal/sec. The following table describes how those values are calculated.

Table 41 Statistics field descriptions

Field	Description
AbsoluteValue	The current value retrieved from the device.
Average/sec	The average value calculated over time.
Minimum/sec	The value is calculated over time using one of the following formula: • `AbsoluteValue/`<*polling interval*> in case of Counter type variables. • `(AbsoluteValue – Previous value)/`<*polling interval*> in case of Integer type variables. However, the table value is updated only if the new Minimum/sec value is less than the previous Minimum/sec.

Table 41 Statistics field descriptions (continued)

Field	Description
Maximum/sec	The value is calculated over time using one of the following formula: • `AbsoluteValue/`<*polling interval*> in case of Counter type variables. • `(AbsoluteValue – Previous value)/`<*polling interval*> in case of Integer type variables. However, the table value is updated only if the new Maximum/sec value is greater than the previous Maximum/sec.
LastVal/sec	The value is calculated over time using one of the following formula: • `AbsoluteValue/`<*polling interval*> in case of Counter type variables. • `(AbsoluteValue – Previous value)/`<*polling interval*> in case of Integer type variables.

Monitoring SNMP Statistics

Device Console > Monitor > Switch > *SNMP Statistics*

Table 42 SNMP Statistics field descriptions

Field	Description
Packets In	The number of messages delivered to the SNMP switch from the transport service.
Packets Out	The number of SNMP Messages passed from the SNMP switch to the transport service.
Packets Using Unsupported SNMP Version	The number of SNMP messages that were received for an unsupported SNMP version.
Packets with Unknown Community String	The number of SNMP messages received that used an unknown SNMP community name.
Packets with Wrong Community String	The number of SNMP messages that represented an SNMP operation that was not allowed by the SNMP community named in the message.
ASN1 Decode Errors	The number of Abstract Syntax Notation One (ASN.1) or BER errors that occurred while the SNMP was decoding received SNMP messages. **Note:** OSI's method of specifying abstract objects is called ASN.1 (Abstract Syntax Notation One, defined in X.208), and one set of rules for representing such objects as strings of ones and zeros is called the BER (Basic Encoding Rules, defined in X.209). ASN.1 is a flexible notation that lets you define a variety of data types, from simple types such as integers and bit strings to structured types such as sets and sequences. BER describes how to represent or encode values of each ASN.1 type as a string of eight-bit octets.
Too Big Errors In	The number of SNMP PDUs that were delivered to the SNMP entity when Too Big Errors In occurred
No Such Name Errors In	The number of SNMP PDUs that were delivered to the SNMP entity when the No Such Names In error occurred.
Bad Value Errors In	The number of SNMP PDUs that were delivered to the SNMP entity when Bad Value Errors occurred.
Read Only Errors In	The number of valid SNMP PDUs that were delivered to the SNMP entity when the Read Only Errors In occurred. **Note:** This is a protocol error that generates an SNMP PDU that contains readOnly in the error status field. This method detects incorrect implementations of the SNMP.
Generic Errors In	The number of SNMP PDUs that were delivered to the SNMP entity when Generic Errors In occurred.

Table 42 SNMP Statistics field descriptions (continued)

Field	Description
MIB Variables Retrieved	The number of MIB objects successfully retrieved by the SNMP switch after valid SNMP get-request and get-next Protocol Data Units (PDU).
MIB Variables Modified	The number of MIB objects that were successfully altered by the SNMP stack after valid SNMP set-request PDUs.
GET Requests In	The number of SNMP get-request PDUs that were accepted and processed by the SNMP stack.
GET NEXT Requests In	The number of SNMP get-next PDUs that were accepted and processed by the SNMP stack.
SET Requests In	The number of SNMP set-request PDUs that were accepted and processed by the SNMP stack.
GET Responses In	The total number of SNMP Get-Response PDUs accepted and processed by the SNMP agent.
Traps Received	The total number of SNMP Trap Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
Too Big Errors Out	The number of SNMP PDUs that were generated by the SNMP entity when Too Big Errors Out occurred.
No Such Names Out	The number of SNMP PDUs that were generated by the SNMP entity when No Such Names Out error occurred.
Bad Value Errors Out	The number of SNMP PDUs that were generated by the SNMP entity when Bad Value Errors Out occurred.
Generic Errors Out	The number of SNMP PDUs that were generated by the SNMP when Generic Errors Out occurred.
GET Requests Out	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
GET NEXT Requests Out	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
SET Requests Out	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
GET Responses Out	The total number of SNMP Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
Traps Out	The total number of SNMP Trap Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.

Viewing Information Summary

Device Console > Monitor > Switch > *Information*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 43 Information Summary field descriptions

Field	Description
Config Save Status	Shows the configuration save status: saveInProgress, saveSuccessful, saveFailed, notInitiated, saveNotRequired
Config Restore Status	Shows the configuration restoration status: restoreInprogress, retoreSuccessful, restoreFailed, notInitiated
Config Restore Version	Shows the restored version of the configuration.
Last Boot Time	The time the switch was last rebooted.
Alloc Count	Total number of packet allocations from the packet buffer pool by the TCP/IP protocol stack.
Release Count	Total number of times the packet buffers are freed (released) to the packet buffer pool by the TCP/IP protocol stack.
Fail Count	Total number of packet allocation failures from the packet buffer pool by the TCP/IP protocol stack.
Peak Usage Count	The highest number of packet allocations with size greater than 128 bytes and less than or equal to 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.

Monitoring Packet Statistics

Device Console > Monitor > Switch > *Packet Statistics*

Table 44 Packet Statistics field descriptions

Field	Description
Packets Allocated	The total number of allocated packets.
Packets Freed	The total number of freed allocated packets.
Failed Packet Allocations	The total number of failed allocated packets.
Medium Packet Allocations	The current number of allocated medium size packets. A medium packet contains between 129 and 1,536 bytes.
Jumbo Packet Allocations	The current number of allocated jumbo size packets. A jumbo packet contains between 1537 and 9,216 bytes.
Small Packet Allocations	The number of allocated small size packets. A small packet contains 128 bytes or less.
Medium Packet Allocations High Water Mark	The maximum number of allocated medium size packets. A medium packet contains between 129 and 1,536 bytes.
Jumbo Packet Allocations High Water Mark	The maximum number of allocated jumbo size packets. A jumbo packet contains between 1,537 and 9,216 bytes.
Small Packet Allocations High Water Mark	The maximum number of allocated small size packets. A small packet contains 128 bytes or less.

Monitoring MP CPU Statistics

Device Console > Monitor > Switch > *MP CPU Statistics*

Table 45 MP CPU Statistics field descriptions

Field	Description
MP Cpu Utilization (1 Second Avg)	The percentage of CPU utilization as measured over the last one-second interval.
MP Cpu Utilization (4 Second Avg)	The percentage of CPU utilization as measured over the last four-second interval.
MP Cpu Utilization (64 Second Avg)	The percentage of CPU utilization as measured over the last 64-second interval.

Monitoring STP Statistics

Device Console > Monitor > Switch > *STP Statistics*

Table 46 Spanning Tree Protocol field descriptions

Field	Description
STG	Shows the Spanning Tree Group number. MIF TEST
Port	Shows the port number.
Receive Cfg	Shows the number of configuration BPDUs received.
Receive TCN	Shows the number of TCN (Topology Change Notification) messages received.
Transmit Cfg	Shows the number of configuration BPDUs transmitted.
Transmit TCN	Shows the number of TCN (Topology Change Notification) messages transmitted.

Monitoring UFD Statistics

Device Console > Monitor > Switch > *UFD Statistics*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 47 Uplink Failure Detection Statistics field descriptions

Field	Description
Number of times LTM link failure	The total numbers of times that link failures were detected on the uplink ports in the Link to Monitor group.
Number of times LTM Link in Blocking State	The total number of times that Spanning Tree Blocking state was detected on the uplink ports in the Link to Monitor group.
Number of times LTD got auto disabled	The total numbers of times that downlink ports in the Link to Disable group were automatically disabled because of a failure in the Link to Monitor group.

Monitoring UFD Information

Device Console > Monitor > Switch > *UFD Information*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 48 Uplink Failure Detection Information field descriptions

Field	Description
UFD State	Shows the operational status of UFD: enabled or disabled.
Link to Monitor Status	Shows the current status of the Link to Monitor (LtM).
Link to Monitor Ports	Shows the ports in the assigned to the LtM.
Link to Monitor Trunks	Shows the trunks assigned to the LtM.
Link to Disable Status	Shows the current status of the Link to Disable (LtD).
Link to Disable Ports	Shows the ports assigned to the LtD.
Link to Disable Trunks	Shows the trunks assigned to the LtD.

Monitoring NTP Statistics

Device Console > Monitor > Switch > *NTP Statistics*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 49 NTP Statistics field descriptions

Field	Description
NTP Requests Sent to Primary NTP Server	The total number of Network Time Protocol (NTP) requests the switch sent to the primary NTP server to synchronize time.
NTP Responses received from Primary NTP Server	The total number of NTP responses received from the primary NTP server.
Update Clock Using Primary NTP Server Response	The total number of times the switch updated its time based on the NTP responses received from the primary NTP server.
NTP Requests sent to Secondary NTP Server	The total number of NTP requests the switch sent to the secondary NTP server to synchronize time.
NTP Responses received from Secondary NTP Server	The total number of NTP responses received from the secondary NTP server.
Update clock using Secondary NTP Server Response	The total number of times the switch updated its time based on the NTP responses received from the secondary NTP server.
Last Update NTP Server	Last update of time on the switch based on either primary or secondary NTP response received.
Last Update NTP Time	The time stamp showing the time when the switch was last updated
Primary Server Key	The NTP Authentication primary server key.
Secondary Server Key	The NTP Authentication secondary server key.
NTP Authentication State	NTP Authentication state. Enabled=1 and Disabled=0

Monitoring Trunk Groups

Device Console > Monitor > Switch > *Trunk Groups*

Table 50 Trunk Groups field descriptions

Field	Description
Index	The switch Trunk Groups, by number.
State	The current operational state of the Trunk Group.
Ports	The member ports within each Trunk Group.

Monitoring Trunk Group Ports

Device Console > Monitor > Switch > *Trunk Group Ports*

Table 51 Trunk Groups field descriptions

Field	Description
Trunk Group	The Trunk Group number.
Port	The port number.
Port State	The link status of the port.

Monitoring TACACS+ Authentication Statistics

Device Console > Monitor > Switch > *TACACS Authentication Statistics*

Table 52 TACACS Authentication Statistics field descriptions

Field	Description
Start Requests	Number of authentication start requests sent to server.
Continue Requests	Number of authentication continue requests sent to server.
Enable Requests	Number of authentication enable requests sent to server.
Abort Requests	Number of authentication abort requests sent to server.
Pass Received	Number of authentication pass received from server.
Fail Received	Number of authentication fails received from server.
Get User Received	Number of authentication get users received from server.
Get Password Received	Number of authentication get passwords received from server.
Get Data Received	Number of authentication get data received from server.
Error Received	Number of authentication errors received from server.
Follow Received	Number of authentication follows received from server.
Restart Received	Number of authentication re starts received from server.
Session Timeout	Number of authentication session time outs.
Auth Requests	Number of authorization requests sent to server.
Auth Pass Adds Received	Number of authorization pass adds received from server.
Auth Pass Replace Received	Number of authorization pass replaces received from server.
Auth Fails Received	Number of authorization fails received from server.
Auth Error Received	Number of authorization errors received from server.
Auth Follows Received	Number of authorization follows received from server.
Auth Session Timeouts	Number of authorization session time outs.
Acct Start Requests	Number of accounting start requests sent to server.
Acct Wd Requests	Number of accounting watchdog requests sent to server.
Acct Stop Requests	Number of accounting stop requests sent to server.
Acct Success Received	Number of accounting success received from server.
Acct Error Received	Number of accounting errors received from server.

Table 52 TACACS Authentication Statistics field descriptions (continued)

Field	Description
Acct Follow Received	Number of accounting follow received from server.
Acct Session Timeouts	Number of accounting session time outs.
Malformed Pkt Received	Number of Malformed packets received from server.
Socket Failure	Number of socket failures occurred.
Connection Failure	Number of connection failures occurred.

How to Monitor a Port

Select Monitor's **Port** category to monitor Port Statistics and Information. This section covers the following port statistics and information topics:

Monitoring Port—Summary

Device Console > Monitor > Ports > *Summary*

Table 53 Port Summary field descriptions

Field	Description
Port	The physical port.
Speed	The port speed.
Bytes In	The number of bytes per second that are being received by the port.
Unicast Packets In	The number of unicast packets per second that are being received by the port.
Bytes Out	The number of bytes per second that are being transmitted by the port.
Unicast Packets Out	The number of unicast packets per second that are being transmitted by the port.
Tag PVID	Displays state of VLAN tag persistence. The default value is enabled, or "tagged". When disabled, or untagged, the VLAN tag is removed from packets where the VLAN tag matches the port PVID. The default value is enabled.

Monitoring Port—Interface Statistics

Device Console > Monitor > Ports > *Interface Statistics*

Table 54 Port Interface field descriptions

Field	Description
Bytes In	The number of bytes received on the interface, including framing characters.
Unicast Packets In	The number of packets, delivered by this sublayer to a higher layer that were not addressed to a multicast or a broadcast address at this sublayer.
Non-Unicast Packets In	The number of packets, delivered by this sublayer to a higher layer that were addressed to a multicast or a broadcast address at this sublayer.
Discarded Packets	The number of inbound packets that were discarded, although no errors had been detected to prevent their delivery to a higher-layer protocol. This can occur to free up buffer space.
Error Packets	For packet-oriented interfaces, the number of inbound packets with errors that prevented their delivery to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units with errors that prevented their delivery to a higher-layer protocol.
Unknown Protocol Packets	For packet-oriented interfaces, the number of packets received via the interface that were discarded because of an unknown or unsupported protocol. For character-oriented or fixed-length interfaces that support protocol multiplexing, the number of transmission units received via the interface that were discarded because of an unknown or unsupported protocol. **Note:** If the interface does not support protocol multiplexing, Unknown Protocol Packets will be zero (0).
Bytes Out	The number of bytes transmitted out of the interface, including framing characters.
Unicast Packets Out	The number of packets that higher-level protocols requested to transmit that were not addressed to a multicast or broadcast address at this sublayer. The count includes the packets that were discarded or not delivered.
Non-Unicast Packets Out	The number of packets that higher-level protocols requested to transmit that were addressed to a multicast or broadcast address at this sublayer. The count includes the packets that were discarded or not delivered.
Outbound Discards	The number of outbound packets that were discarded, although no errors had been detected that would prevent their transmission. This can occur to free up buffer space.

Table 54 Port Interface field descriptions (continued)

Field	Description
Not Sent Due to Error	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.
Outbound Packet Queue Length	The number of packets in the output queue.
Broadcasts In	The number of packets, delivered by this sublayer to a higher layer, that were addressed to a broadcast address at this sublayer.
Broadcasts Out	The number of packets that higher-level protocols requested to transmit that were addressed to a broadcast address at this sublayer. The count includes the packets that were discarded or not delivered.
Multicasts In	The number of packets, delivered by this sublayer to a higher layer that were addressed to a multicast address at this sublayer. For a MAC layer protocol, this includes Group and Functional addresses.
Multicasts Out	The number of packets that higher-level protocols requested to transmit that were addressed to a multicast address at this sublayer. The count includes the packets that were discarded or not sent. For a MAC layer protocol, this count includes Group and Functional addresses.

Monitoring Port—802.1x Statistics

Device Console > Monitor > Ports > *802.1x Statistics*

Table 55 Port 802.1x field descriptions

Field	Description
EAPOL Frames Received	Total number of EAPOL frames received.
EAPOL Frames Transmitted	Total number of EAPOL frames transmitted.
EAPOL Start Frames Received	Total number of EAPOL start frames received.
EAPOL Logoff Frames Received	Total number of EAPOL logoff frames received.
EAPOL Response Id Frames Received	Total number of EAPOL response ID frames received.
EAPOL Response Frames Received	Total number of EAPOL response frames received.
EAPOL Request Id Frames Transmitted	Total number of EAPOL request ID frames transmitted.
EAPOL Request Frames Transmitted	Total number of EAPOL request frames transmitted.
Invalid EAPOL Frames Received	Total number of invalid EAPOL frames received.

Monitoring Port—LACP Statistics

Device Console > Monitor > Ports > *LACP Statistics*

Table 56 Port LACP Statistics field descriptions

Field	Description
Valid LACPDUs Received	Total number of valid LACP data units received.
Valid Marker PDUs Received	Total number of valid LACP marker data units received.
Valid Marker Rsp PDUs Received	Total number of valid LACP marker response data units received.
Unknown Version/ TLV Type	Total number of LACP data units with an unknown version or type, length, and value (TLV) received.
Illegal Subtype Received	Total number of LACP data units with an illegal subtype received.
LACPDUs Transmitted	Total number of LACP data units transmitted.
Marker PDUs Transmitted	Total number of LACP marker data units transmitted.
Marker Rsp PDUs Transmitted	Total number of LACP marker response data units transmitted.

Monitoring Port—LACP Aggregator Information

Device Console > Monitor > Ports > *LACP Aggregator*

Table 57 Port LACP Aggregator Information field descriptions

Field	Description
MAC Address	MAC address assigned to the aggregator.
Actor System Priority	Priority value associated with the Actor's System ID.
Actor System ID	Unique identifier for the System where this aggregator resides.
Individual State	Indicates whether the aggregator represents an Individual link (true) or an Aggregate (false).
Actor Oper Key	Current value of the operational key for the aggregator.
Partner System Priority	Priority value associated with the Partner's System ID.
Partner System ID	Unique identifier for the current protocol Partner of this aggregator.
Partner Oper Key	Current value of the operational key for the aggregator’s current protocol partner
Ready State	Indicates whether the aggregator is ready or not.
Number of Ports in	Total number of member ports within this aggregator.

Monitoring Port—LACP Port Aggregator Information

Device Console > Monitor > Ports > *LACP Port Aggregator*

Table 58 Port LACP Port Aggregator Information field descriptions

Field	Description
LACP Status	Current LACP status for the port: true or false
LACP Admin Status	Current LACP admin status: true or false
Actor System ID	Unique identifier for the System where this aggregator resides.
Actor System Priority	Priority value associated with the Actor's System ID.
Actor Admin Key	Current value of the administration key for the Aggregation Port.
Actor Oper Key	Current value of the operational key for the Aggregation Port.
Actor Port Number	Port number locally assigned to the Aggregation Port.
Actor Port Priority	Priority value assigned to this Aggregation Port.
Individual State	Indicates whether the Aggregation Port operates only as an Individual link (`true`) or is able to aggregate (`false`).
Selected Aggregator ID	Identifier of the aggregator that this Aggregation Port has currently selected.
Attached Aggregator ID	Identifier of the aggregator to which this Aggregation Port is currently attached.
Ready_N Flag	Indicates whether or not the timer has expired while waiting to attach to an aggregator.
Need to Transmit Flag	Displays the new protocol information to be transmitted on the link.
Selection Logic	Indicates the selection logic. A value of selected indicates the selection of an appropriate aggregator. A value of unselected indicates that no aggregator is currently selected and standby indicates a restriction on the selected aggregator.
Port Moved	Indicates whether or not if receive machine for a port is in the `port_disabled` state, and the combination of partner oper system and partner oper port number in use by the port, has been received in an incoming LACPDU on a different port.
Collision and Detection State	State of Collision Detection: `on` or `off`
Rx Machine State	State of the Rx Machine.
Mux Machine State	State of the Mux Machine.
Periodic Machine State	State of the Periodic Machine.

Monitoring Port—LACP Port Administrator Information

Device Console > Monitor > Layer 2 > LACP > *LACP Port Administrator Information*

This tab is used used to show LACP Port Administrator Information.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 59 Port LACP Port Administrator Information field descriptions

Field	Description
Actor Administrator Port State	The state of the Actor Administrator Port. This is an octet mask with the following bits: Activity, Synchronization, Defaulted, Timeout, Collecting, Expired, Aggregation and Distributing. If all of them are 0, the state is displayed as 0x0, otherwise it isdisplayed a blank state, which is not a NULL state.
Actor Administrator Port Activity	The state of Actor Administrator Port Activity
Actor Administrator Port Synchronization	The state of Actor Administrator Port Synchronization
Actor Administrator Port Defaulted	The state of Actor Administrator Port Defaulted
Actor Administrator Port Timeout	The state of Actor Administrator Port Timeout
Actor Administrator Port Collecting	The state of Actor Administrator Port Collecting
Actor Administrator Port Expired	The state of Actor Administrator Port Expired
Actor Administrator Port Aggregation	The state of Actor Administrator Port Aggregation
Actor Administrator Port Distributing	The state of Actor Administrator Port Distributing

Monitoring Port—LACP Port Operator Information

Device Console > Monitor > Layer 2 > LACP > *LACP Port Operator Information*

This tab is used used to show LACP Port Operator Information.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 60 Port LACP Port Operator Information field descriptions

Field	Description
Partner Operator Port System Priority	The value of Partner Operator Port System Priority
Partner Operator Port System ID	Partner Operator Port System ID
Partner Operator Port Key	The value of Partner Operator Port Key
Partner Operator Port Number	The Partner Operator Port Number
Partner Operator Port Priority	The value of Partner Operator Port Priority
Actor Operator Port State	The state of the Actor Operator Port. This is an octet mask with the following bits: Activity, Synchronization, Defaulted, Timeout, Collecting, Expired, Aggregation, and Distributing. If all of them are 0, the state is displayed as 0x0, otherwise it isdisplayed a blank state, which is not a NULL state.
Actor Operator Port Activity	The state of Actor Operator Port Activity
Actor Operator Port Synchronization	The state of Actor Operator Port Synchronization
Actor Operator Port Defaulted	The state of Actor Operator Port Defaulted
Actor Operator Port Timeout	The state of Actor Operator Port Timeout
Actor Operator Port Collecting	The state of Actor Operator Port Collecting
Actor Operator Port Expired	The state of Actor Operator Port Expired
Actor Operator Port Aggregation	The state of Actor Operator Port Aggregation

Table 60 Port LACP Port Operator Information field descriptions (continued)

Field	Description
Actor Operator Port Distributing	The state of Actor Operator Port Distributing
Partner Operator Port State	The state of the Partner Operator Port. This is an octet mask with the following bits: Activity, Synchronization, Defaulted, Timeout, Collecting, Expired, Aggregation, and Distributing. If all of them are 0, the state is displayed as 0x0, otherwise it isdisplayed a blank state, which is not a NULL state.
Partner Operator Port Activity	The state of Partner Operator Port Activity
Partner Operator Port Synchronization	The state of Partner Operator Port Synchronization
Partner Operator Port Defaulted	The state of Partner Operator Port Defaulted
Partner Operator Port Timeout	The state of Partner Operator Port Timeout
Partner Operator Port Collecting	The state of Partner Operator Port Collecting
Partner Operator Port Expired	The state of Partner Operator Port Expired
Partner Operator Port Aggregation	The state of Partner Operator Port Aggregation
Partner Operator Port Distributing	The state of Partner Operator Port Distributing

Monitoring Port—IP Statistics

Device Console > Monitor > Ports > *IP Statistics*

Table 61 Port IP Statistics field descriptions

Field	Description
Good Packets In	Number of good packets received.
Header Error Packets In	Number of header error packets received.
Inbound Discard Packets	Number of discarded inbound packets.

Monitoring Port—Authenticator Diagnostics Statistics

Device Console > Monitor > Ports > *Authenticator Diagnostics Statistics*

Table 62 Port Authenticator Diagnostics Statistics field descriptions

Field	Description
Authentication Enters Connecting	Total number of times that the state machine transitions to the CONNECTING state from any other state.
Authentication Logoffs	Total number of times that the state machine transitions from CONNECTING to DISCONNECTED as a result of receiving an EAPOLLogoff message.
Authentication Enter Authenticating	Total number of times that the state machine transitions from CONNECTING to AUTHENTICATING, as a result of an EAPResponse/ Identity message being received from the Supplicant.
Authentication Success	Total number of times that the state machine transitions from AUTHENTICATING to AUTHENTICATED, as a result of the Backend Authentication state machine indicating successful authentication of the Supplicant.
Authentication Timeout	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of the Backend Authentication state machine indicating authentication timeout.
Authentication Failure	Total number of times that the state machine transitions from AUTHENTICATING to HELD, as a result of the Backend Authentication state machine indicating authentication failure.
Reauthentications	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of a re-authentication request.
EAP Starts while Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of an EAPOL-Start message being received from the Supplicant.
EAP Logoff while Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of an EAPOL-Logoff message being received from the Supplicant.
Reauthentications after Authentication	Total number of times that the state machine transitions from AUTHENTICATED to CONNECTING, as a result of a re-authentication request.
EAP Starts after Authentication	Total number of times that the state machine transitions from AUTHENTICATED to CONNECTING, as a result of an EAPOL-Start message being received from the Supplicant.
EAP Logoff after Authentication	Total number of times that the state machine transitions from AUTHENTICATED to DISCONNECTED, as a result of an EAPOLLogoff message being received from the Supplicant.

Table 62 Port Authenticator Diagnostics Statistics field descriptions (continued)

Field	Description
Backend Responses	Total number of times that the state machine sends an initial Access-Request packet to the Authentication server. Indicates that the Authenticator attempted communication with the Authentication Server.
Backend Access Challenges	Total number of times that the state machine receives an initial Access-Challenge packet from the Authentication server. Indicates that the Authentication Server has communication with the Authenticator.
Other Backend Requests	Total number of times that the state machine sends an EAP-Request packet (other than an Identity, Notification, Failure, or Success message) to the Supplicant. Indicates that the Authenticator chose an EAP-method.
Backend Non Nak Responses	Total number of times that the state machine receives a response from the Supplicant to an initial EAP-Request, and the response is something other than EAP-NAK. Indicates that the Supplicant can respond to the Authenticators chosen EAP-method.
Backend Authentication Success	Total number of times that the state machine receives an Accept message from the Authentication Server. Indicates that the Supplicant has successfully authenticated to the Authentication Server.
Backend Authentication Failures	Total number of times that the state machine receives a Reject message from the Authentication Server. Indicates that the Supplicant has not authenticated to the Authentication Server.

Monitoring Port—Bridge Statistics

Device Console > Monitor > Ports > *Bridge Statistics*

Table 63 Port bridge field descriptions

Field	Description
Maximum size of INFO	The maximum size of the INFO (non-MAC) field that this port will receive or transmit.
Frames In	The number of frames that have been received by this port from its segment. **Note:** Packets In only counts frames that are for a protocol being processed by the local bridging function, including bridge management frames.
Frames Out	The number of frames that have been transmitted by this port to its segment. **Note:** Packets Out only counts frames that are for a protocol being processed by the local bridging function, including bridge management frames.
Discarded Frames In	The number of valid received frames that were discarded (filtered) by the forwarding process.

Monitoring Port—Ethernet Error Statistics

Device Console > Monitor > Ports > *Ethernet Error Statistics*

Table 64 Port Ethernet Error Statistics field descriptions

Field	Description
Alignment Errors	The number of frames received on a particular interface that were not of integral length and did not pass the FCS check. The count is incremented when the Alignment Error status is returned by the MAC service to the LLC, or other MAC user. Frames with multiple errors are counted exclusively.
FCS Errors	The number of frames received on a particular interface that failed the FCS health check because of length. The count is incremented when the Frame Check Error status is returned by the MAC service to the LLC, or other MAC user. Frames with multiple errors are counted exclusively.
Single Collision Frames	The number successfully transmitted frames on a particular interface where transmission was inhibited by a single collision. **Note:** A frame that is counted by Single Collision Frames can also be counted by the occurrences of the Unicast Packets Out, Multicasts Out, or Broadcast Out, but not recorded by the event of Multiple Collision Frames.
Multiple Collision Frames	A count of successfully transmitted frames on a particular interface where transmission was inhibited by more than one collision. **Note:** A frame that is counted by Multiple Collision Frames can also be counted by Unicast Packets Out, Multicasts Out, or Broadcast Out, but not recorded by Single Collision Frames.
SQE Test Errors	The number of times the SQE TEST ERROR message was generated by the PLS sublayer for a particular interface.
Deferred Transmissions	A number of frames where the first transmission attempt, on a particular interface, is delayed because the medium is busy. **Note:** The count represented by an instance of this object does not include frames involved in collisions.
Late Collisions	The number of times that a collision is detected, on a particular interface, later than 512 bit-times into the transmission of a packet. A late collision, included in the count of Late Collisions, can be considered as a generic collision for other statistics. **Note:** bit-times vary per system. Example: On a 10Mbps system, 512 bit-times represents 51.2 microseconds.
Excessive Collisions	A number of frames on a particular interface in which transmission failed because of excessive collisions.

Table 64 Port Ethernet Error Statistics field descriptions (continued)

Field	Description
Internal MAC Transmission Errors	The number of frames transmitted on a particular interface that failed because of an internal MAC sublayer transmit error.This frame error is only counted if it was not recorded under Late Collisions, Excessive Collisions, or Carrier Sense Errors. **Note:** Internal Mac Transmit Errors may represent a number of transmission errors that were not otherwise recorded.
Carrier Sense Errors	The number of times the carrier sense condition was lost or was never asserted while attempting to transmit a frame on a particular interface. The count, represented by an instance of this object, is incremented once per transmission attempt.
Received Frames > Maximum Length	A number of frames received on a specific interface that exceeded the allowed maximum frame size. The count is incremented when the Received Frames > Maximum Length status is returned by the MAC service to the LLC, or other MAC user. Received frames that have multiple errors are counted exclusively.
Internal MAC Receive Errors	The number of frames on a specific interface that could not be accepted because of an internal MAC sublayer error. This frame error is only counted if it was not recorded under Received Frames > Maximum Length, Alignment Errors, or FCS Errors. **Note:** Internal Mac Receive Errors may represent a number of receive errors that were not otherwise recorded.

Monitoring Port—Transceiver Information

Device Console > Monitor > Ports > *Transceiver Info*

Note: This tab is available only for switches with 10G ports. Please disregard this information if it does not apply to your switch.

Table 65 Port Transceiver Information field descriptions

Field	Description
Port	10G port index
Port SFP/XFP Alias	10G SFP/XFP port alias
Device	Device name. “NO device” indicates device/cable is not connected.
Tx Enable	TX-Enable status. It can be (i) Not Installed (ii) Enabled (iii) Disabled (iv) Detached (v) Not Available
Rx Signal	RX-Signal status, as follows: e (i) Not Installed (ii) Down (iii) Link (iv) Detached (v) Not Available
Tx Fault	TX-Fault status, as follows: (i) Not Installed (ii) Fault (iii) None (iv) Detached (v) Not Available
Vendor	Vendor name of the device
Serial Number	Serial number of the device
Approval	Approval state for the device, as follows: (i) Not Installed (ii) Not Approved (iii) Approved (iv) Detached
Device Part Number	External Port SFP/XFP device part number.
Device Revision	External Port SFP/XFP device revision.
Device Voltage	External Port SFP/XFP device voltage.
Device Temperature	External Port SFP/XFP device temperature.
Device Laser Wave Length	External Port SFP/XFP device laser wave length.

How to Monitor Bridge Statistics

Select Monitor's **Bridge** category to monitor Bridge Statistics and Information. This section covers the following bridge statistics and information topics:

Monitoring Bridge—Forwarding Database Information

Device Console > Monitor > Layer 2 > Bridge > *Forwarding Database Information*

Table 66 Forwarding Database field descriptions

Field	Description
MAC Address	The MAC address of the FDB entry.
VLAN/Group	The VLAN number or Group number of the FDB entry.
Port	The physical port on which the MAC address is located
State	The status of the bridge: forwarding or unknown. An address that is in the forwarding state means that it has been learned by the switch. If the state for the port is listed as unknown, the MAC address has not yet been learned by the switch, but has only been seen as a destination address.
Trunk	Shows all FDB entries on a single trunk. When trunk groups are configured, you can view the state of each port in the various trunk groups.

Monitoring Bridge—Forwarding Statistics

Device Console > Monitor > Layer 2 > Bridge > *Forwarding Statistics*

Table 67 Monitoring Forwarding Statistics field descriptions

Field	Description
Current Entries	Current number of entries in the Forwarding Database.
Highest Number of Entries	Highest number of entries recorded at any given time in the Forwarding Database.

Monitoring Bridge—Forwarding Database Multicast Information

Device Console > Monitor > Layer 2 > Bridge > *Forwarding Database Multicast Information*

Table 68 Monitoring Forwarding Database Multicast Information field descriptions

Field	Description
Index	The static multicast FDB entry index.
MAC Address	The static multicast MAC address for the FDB entry.
VLAN	The VLAN ID for the FDB entry.
Ports	The multicast MAC address port list. The ports are presented in bitmap format in receiving order: OCTET 1 OCTET 2 ..... xxxxxxxx xxxxxxxx ..... |||||_ port 8 |||| ||||___ port 7 |||____ port 6 ||. . . ||_____ port 1 |_____ reserved where x can have one of the following values: 1 - The represented port belongs to the multicast MAC address. 0 - The represented port does not belong to the multicast MAC address.

Monitoring Bridge—Base Port Information

Device Console > Monitor > Layer 2 > Bridge > *Base Port Information*

Table 69 Monitoring Base Port field descriptions

Field	Description
STP	The index for Spanning Tree Protocol groups.
Port	The port number for Spanning Tree Protocol groups.
State	The current state of the port as defined by Spanning Tree Protocol, as follows: disabled, blocking, listening, learning, forwarding, discarding, or broken.
Designated Root	The unique Bridge Identifier of the Bridge recorded as the Root in the Configuration BPDUs transmitted by the Designated Bridge for the segment to which the port is attached.
Designated Cost	The path cost of the Designated Port of the segment connected to this port. This value is compared to the Root Path Cost field in received bridge PDUs.
Designated Bridge	The designated bridge resides closest to the root bridge and is responsible for forwarding packets from the LAN towards the root bridge. This bridge is displayed as character string starting with the bridge priority (1-65535) followed by a hyphen and six byte MAC address of that switch.
Designated Port	The designated port identifies the physical ports.
Forward Transitions	The number of times this port has transitioned from the Learning state to the Forwarding state.
Path Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated

Monitoring Bridge—CIST Bridge Information

Device Console > Monitor > Layer 2 > Bridge > *CIST Bridge Information*

Table 70 CIST Bridge field descriptions

Field	Description
Bridge	The bridge identifier.
Path Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated.
Port	The port number.
Hello Time	The Hello interval in seconds.
Max Age	Displays the value in seconds that all bridges use for MaxAge when this bridge is acting as the root.
Forward Delay	The time (in seconds) for a CIST bridge root forward delay.
Regional Root	The regional root.
Regional Path Cost	The regional path cost.
Mstp Digest	Displays the digest of MSTP.

Monitoring Bridge—CIST Port Information

Device Console > Monitor > Layer 2 > Bridge > *CIST Port Information*

Table 71 CIST Port field descriptions

Field	Description
Port	Specifies the CIST bridge port being configured.
Priority	The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Path Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated.
State	Specifies if the CIST Bridge port is enabled or disabled.
Role	Specifies the role of the CIST Bridge port.
Designated Bridge	The designated bridge resides closest to the root bridge and is responsible for forwarding packets from the LAN towards the root bridge. This bridge is displayed as character string starting with the bridge priority (1-65535) followed by a hyphen and six byte MAC address of that switch.
Designated Port	The designated port identifies a physical port. This is a number that is the numerical sum of bridge priority and the actual physical port number. For example, a physical port number four with bridge priority 32768 will be displayed as 32678+4=32772.
Link Type	The port link type.

Monitoring Bridge—STP Information

Device Console > Monitor > Layer 2 > Bridge > *STP*

Table 72 STP Information field descriptions

Field	Description
STG	Spanning Tree Group index.
Time Since Topology Change	Time since the last time a topology change was detected by the bridge entity, in milliseconds.
Topology Changes	Total number of topology changes detected by this bridge since the management entity was last reset or initialized.
Designated Root	Bridge identifier of the root of the spanning tree, as determined by the Spanning Tree Protocol executed by this node. This value is used as the Root Identifier in all Configuration Bridge PDUs originated by this node.
Root Cost	Cost of the path to the root, as seen from this bridge.
Root Port	Port number of the port which offers the lowest cost path from this bridge to the root bridge.
Maximum Age	Maximum age of Spanning Tree Protocol information learned from the network on any port before it is discarded, in hundredths of a second. This is the actual value that currently is in use on this bridge.
Hello Time	Amount of time between the transmission of Configuration Bridge PDUs by this node on any port when it is the root of the spanning tree or trying to become so, in hundredths of a second. This is the actual value that currently is in use on this bridge.
Forward Delay	Time value that controls how fast a port changes its spanning state when moving towards the Forwarding state, in hundredths of a second. The Forward Delay value determines how long the port stays in each of the Listening and Learning states, which precede the Forwarding state. The Forward Delay value is also used to age all dynamic entries in the Forwarding Database, after a topology change has been detected.
Hold Time	Time interval during which no more than two Configuration Bridge PDUs are transmitted by this node, in hundredths of a second.

How to Monitor LLDP Information

Select Monitor's **Layer 2 > LLDP** category to monitor Link Layer Detection Protocol (LLDP) information. This section covers the following topics:

Monitoring LLDP Port Information

Device Console > Monitor > Layer 2 > LLDP > *LLDP Port Info*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 73 LLDP Port Information field descriptions

Field	Description
Port	The port alias or number.
EVB TLV State	Shows whether EVB TLV state is enabled or disabled.

Viewing EVB (Edge Virtual Bridging) Local Information

Device Console > Monitor > Layer 2 > LLDP > *EVB Local Info*

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 74 EVB Local Information field descriptions

Field	Description
Index	EVB index number.
Port	Port associated with the local EVB.
Capability	Supported capabilities.
Current	Current capabilities.
RTE Value	Local ECP RTE value.

Viewing EVB (Edge Virtual Bridging) Remote Information

Device Console > Monitor > Layer 2 > LLDP > *EVB Remote Info*

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 75 EVB Remote Information field descriptions

Field	Description
Index	EVB index number.
Port	Port associated with the remote EVB.
Capability	Supported capabilities.
Current	Current capabilities.
RTE Value	Remote ECP RTE value.

How to Monitor Failover Information

Select Monitor's **Layer 2 > Failover** category to monitor Failover information. This section covers the following Failover topics:

Monitoring General Trigger Status

Device Console > Monitor > Layer 2 > Failover > *General*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 76 Failover General field descriptions

Field	Description
Failover State	Failover state (on or off)

Monitoring Trigger Information

Device Console > Monitor > Layer 2 > Failover > *Trigger Information*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 77 Failover Trigger Information field descriptions

Field	Description
Trigger ID	Trigger identifier
Trigger State	Trigger state (enabled or disabled)
Operational Links Limit	Limit on number of operational links
Monitor State	Runtime monitor state (up or down)
Monitored Ports	List of monitored ports
Control State	Runtime controlled state (auto-controlled or auto-disabled)
Controlled Ports	List of controlled ports

Monitoring Monitored Port Status

Device Console > Monitor > Layer 2 > Failover > *Monitor Port Status*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 78 Failover Monitor Port Status field descriptions

Field	Description
Trigger ID	Trigger identifier
Monitored Port	Port number of the monitored port.
Port Status	Port status (operational or failed)

Monitoring Controlled Port Status

Device Console > Monitor > Layer 2 > Failover > *Control Port Status*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 79 Failover Control Port Status field descriptions

Field	Description
Trigger ID	Trigger identifier
Controlled Port	Port number of the controlled port.
Port Status	Port status (operational or failed)

How to Monitor vLAG Information

Select Monitor's **Layer 2 > VLAG** category to monitor vLAG information. This section covers the following vLAG information topics:

Monitoring vLAG General Information

Device Console > Monitor > Layer 2 > VLAG > *General*

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 80 vLAG General field descriptions

Field	Description
State	The current running state of vLAG. The value can be Up or Down.
Admin Role	The current admin role of the switch. The role can be Primary, Secondary, or Unelected.
Operational Role	The vLAG switch operational role. The value can be Unselected (0), Primary (1), or Secondary (2).
ISL Trunk Id	The vLAG ISL Trunk ID.
Local MAC	The local vLAG MAC address.
Local Priority	The local vLAG priority.
Peer MAC	The peer vLAG MAC address.
Peer Priority	The peer vLAG priority.
Health Check Status	The current health check running status. The value can be Up or Down.
Startup Delay Interval	The startup delay timer interval.
Startup Delay Status	The startup delay timer status. The value can be Unstarted (1), Running (2), or Finished (3).
System MAC	The system vLAG MAC address.
Auto Recovery Status	The system auto recovery status.
Auto Recovery Interval	The system auto recovery interval.

Monitoring vLAG Instance Information

Device Console > Monitor > Layer 2 > VLAG > *Instance Information*

Use this tab to view vLAG Instance Information.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 81 vLAG Instance Information field descriptions

Field	Description
Id	The Identifier of the instance.
Trunk Id	The Trunk ID of the instance.
Admin Key	The Admin Key of the vLAG instance. Only applicable with dynamic trunks.
State	The current running state of the vLAG instance. The state can be Down(1), localUp(2), remoteUp(3), or formed(4).

Monitoring vLAG ISL Group Information

Device Console > Monitor > Layer 2 > VLAG > *ISL Group Information*

Use this tab to view vLAG ISL Group Information.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 82 vLAG ISL Group Information field descriptions

Field	Description
ISL Id	The vLAG ISL ID.
Trunk Group State	The vLAG ISL trunk group state. The state can be: • Static(1) - static trunk group • Lacp (2) - dynamic trunk group
Trunk	The vLAG ISL portchannel number.
Admin Key	The vLAG ISL LACP admin key.
Ports	The Local vLAG MAC address.
Port State	The Local vLAG MAC address.

Monitoring vLAG PDU Statistics

Device Console > Monitor > Layer 2 > VLAG > *PDU*

Use the **PDU** tab to view the VLAG PDU statistics.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 83 vLAG PDU statistics field descriptions

Field	Description
Sent for Role Election	The total number of vLAG PDUs sent for role elections.
Sent for System Info	The total number of vLAG PDUs sent for role system info.
Sent for Peer Instance Enable	The total number of vLAG PDUs sent for peer instance enable.
Sent for Peer Instance Disable	The total number of vLAG PDUs sent for peer instance disable.
Sent for FDB Dynamic Add	The total number of vLAG PDUs sent for addition of FDB dynamic entry.
Sent for FDB Dynamic Delete	The total number of vLAG PDUs sent for deletion of FDB dynamic entry.
Sent for FDB Inactive Add	The total number of vLAG PDUs sent for addition of FDB inactive entry.
Sent for FDB Inactive Delete	The total number of vLAG PDUs sent for deletion of FDB inactive entry.
Sent for Health Check	The total number of vLAG PDUs sent for health check.
Sent for ISL Hello	The total number of vLAG PDUs sent for ISL hello.
Sent for Other	The total number of vLAG PDUs sent for others.
Sent for Unknown	The total number of vLAG PDUs sent for unknowns.
Received for Role Election	The total number of vLAG PDUs received for role elections.
Received for System Info	The total number of vLAG PDUs received for role system info.
Received for Peer Instance Enable	The total number of vLAG PDUs received for peer instance enable.
Received for Peer Instance Disable	The total number of vLAG PDUs received for peer instance disable.

Table 83 vLAG PDU statistics field descriptions (continued)

Field	Description
Received for FDB Dynamic Add	The total number of vLAG PDUs received for addition of FDB dynamic entry.
Received for FDB Dynamic Delete	The total number of vLAG PDUs received for deletion of FDB dynamic entry.
Received for FDB Inactive Add	The total number of vLAG PDUs received for addition of FDB inactive entry.
Received for FDB Inactive Delete	The total number of vLAG PDUs received for deletion of FDB inactive entry.
Received for Health Check	The total number of vLAG PDUs received for health check.
Received for ISL Hello	The total number of vLAG PDUs received for ISL Hello.
Received for Other	The total number of vLAG PDUs received for others.
Received for Unknown	The total number of vLAG PDUs received for unknowns.

Monitoring vLAG IGMP Statistics

Device Console > Monitor > Layer 2 > VLAG > *IGMP*

Use the **IGMP** tab to view the vLAG IGMP statistics.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 84 vLAG IGMP field descriptions

Field	Description
Reports Forwarded	The total number of IGMP reports forwarded to the peer.
Leaves Forwarded	The total number of IGMP leaves forwarded to the peer.

Monitoring vLAG ISL Statistics

Device Console > Monitor > Layer 2 > VLAG > *ISL*

Use the **ISL** tab to view the vLAG ISL statistics.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 85 vLAG ISL field descriptions

Field	Description
In Octets	The total number of vLAG ISL octets received.
In Packets	The total number of vLAG ISL packets received.
Out Octets	The total number of vLAG ISL octets sent.
Out Packets	The total number of vLAG ISL packets sent.

How to Monitor Hotlinks Statistics

Select Monitor's **Hotlinks** category to monitor Hotlinks statistics. This section covers the following Hotlinks statistics topics:

Monitoring Hotlinks Summary

Device Console > Monitor > Layer 2 > Hotlinks > *Summary*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 86 Hotlinks Summary field descriptions

Field	Description
ID	The trigger identifier
Name	The trigger name
State	Trigger state – enable or disable
Preempt State	Preempt State – enable or disable
Forward Delay	Forward Delay setting in seconds
Active	The active interface information

Monitoring Hotlinks Statistics

Device Console > Monitor > Layer 2 > Hotlinks > *Statistics*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 87 Hotlinks Statistics field descriptions

Field	Description
Trigger ID	Trigger ID number.
Master Active	Total number of times the Master interface transitioned to the Active state.
Backup Active	Total number of times the Backup interface transitioned to the Active state.
FDB Update	Total number of FDB update requests sent.
FDB Failed	Total number of FDB update requests that failed.

Monitoring Hotlinks Information

Device Console > Monitor > Layer 2 > Hotlinks > *Info*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 88 Hotlinks Info field descriptions

Field	Description
Hotlinks Setting	Hotlinks on/off setting
Hotlinks FDB Update Setting	Hotlinks FDB update enabled/disabled setting
Hotlinks BPDU Flood Setting	Hotlinks BPDU Flood enabled/disabled setting
Hotlinks FDB Update Rate	Hotlinks FDB update rate (packets per second)

How to Monitor 802.1x/p Information

Select Monitor's **802.1x/p** category to monitor 802.1x/p information. This section covers the following 802.1x/p information topics:

Monitoring 802.1x General Information

Device Console > Monitor > Layer 2 > 802.1x/p > *802.1x General*

Table 89 802.1X General Information field descriptions

Field	Description
System Capability	The capability of the switch as an 802.1x Authenticator. It cannot be used as an Authentication Server or a Supplicant.
System Status	The operational status of 802.1x: enabled or disabled
Protocol Version	The protocol version in use.

Monitoring 802.1p—Priority COSq Information

Device Console > Monitor > Layer 2 > 802.1x/p > *802.1p Priority COSq*

Table 90 802.1p Priority COSq Information field descriptions

Field	Description
Priority	The 802.1p priority level.
COSq	The Class of Service queue number.
Weight	The scheduling weight of the COS queue.

Monitoring Port Priority Information

Device Console > Monitor > Layer 2 > 802.1x/p > *Port Priority*

Table 91 802.1p Port Priority Information field descriptions

Field	Description
Port	The port number.
Priority	The 802.1p priority level for the port.
COSq	The Class-of-Service (COS) queue number.
Weight	The scheduling weight of the COS queue.

How to Monitor ECP (Edge Control Protocol) Information

Select Monitor's **Layer 2 > ECP** category to view ECP information. This section covers the following topics:

Viewing ECP (Edge Control Protocol) Channel Information

Device Console > Monitor > Layer 2 > ECP > *ECP Channel Info*

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 92 ECP Channel Information field descriptions

Field	Description
Index	ECP index number.
Port	Port associated with the ECP channel.
S-Tag	VLAN tag with a Tag Protocol Identification value allocated for “802.1Q Service Tag Type.”
Send Length	Send length value.
Send Next	Index number associated with the next send.
Receive Last Sequence	Sequence number associated with the last received.
State Machine	State machine index.
Rx Count	Received packets count.
Tx Count	Transmitted packets count.
Rx Drop	Number of packets dropped during receive.
Tx Drop	Number of packets dropped while transmitting.
State	State (enabled or disabled).

How to Monitor LACP (Link Aggregation Control Protocol) Information

Select Monitor's **Layer 2 > LACP** category to view LACP information. This section covers the following topics:

How to Monitor IP Routing

Select Monitor's **Routing > IP** category to monitor IP Routing Statistics and Information. This section covers the following IP Routing statistics and information topics:

Monitoring IP Routing—IP Interface Statistics

Device Console > Monitor > Layer 3 > IP > *IP Interface Statistics*

Table 93 Routing IP Interface Statistics field descriptions

Field	Description
Interface	The number of the interface. The interface number is either one of the 256 IP interfaces or one of the physical ports.
Bytes In	The number of bytes received on the interface, including framing characters.
Bytes Out	The number of bytes transmitted out of the interface, including framing characters.
Unicast Packets In	The number of packets, delivered by this sublayer to a higher layer that were not addressed to a multicast or a broadcast address at this sublayer.
Unicast Packets Out	The number of packets that higher-level protocols requested to transmit that were not addressed to a multicast or broadcast address at this sublayer. The count includes the packets that were discarded or not delivered.
Multicasts In	The number of packets, delivered by this sublayer to a higher layer that were addressed to a multicast address at this sublayer. For a MAC layer protocol, this includes Group and Functional addresses.
Multicasts Out	The number of packets that higher-level protocols requested to transmit that were addressed to a multicast address at this sublayer. The count includes the packets that were discarded or not sent.For a MAC layer protocol, this includes Group and Functional addresses.
Discarded Packets	The number of inbound packets that were discarded, although no errors had been detected to prevent their delivery to a higher-layer protocol. This can occur to free up buffer space.
Outbound Discards	The number of outbound packets that were discarded, although no errors had been detected that would prevent their transmission. This can occur to free up buffer space.
Error Packets	For packet-oriented interfaces, the number of inbound packets with errors that prevented their delivery to a higher-layer protocol.For character-oriented or fixed-length interfaces, the number of inbound transmission units with errors that prevented their delivery to a higher-layer protocol.
Not Sent Due to Error	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.

Monitoring IP Routing—Interface Information

Device Console > Monitor > Layer 3 > IP > *Interface Information*

Table 94 Routing IP Interface Information field descriptions

Field	Description
Interface	The interface type: • An IP interface; for example *IP 10*. • A physical (port) number depending on the switch; for example *Downlink2.*
Description	A text string containing information about the interface. • A logical interface is described as *net0*, *net1*, etc. • A Fast Ethernet physical (port) interface is described as *utp ethernet (10/100)* • A Gigabit Ethernet physical (port) interface is described as *fiber ethernet (1000)*
Type	The type of interface. A virtual interface (`propVirtual`) or a physical interface that is assigned to a switch port (e.g. `ethernetCsmacd`).
MTU (Largest Packet)	The size of the largest datagram which can be sent or received on the interface, specified in octets
Speed	The speed of the physical interface: 10 Mbps, 100 Mbps, 1000Mbps, 10000Mbps, 40000Mbps, any or other.
MAC Address	The MAC address of the physical interface.
Admin State	The administrative state of the Interface: up, down or testing
Operational Status	The status of the Interface: up, down, testing, unknown, dormant, notPresent or lowerLayerDown.
Last Change	Lists the date of the last change to the interface.
MIB Specification	A reference to MIB definitions those are specific to the media that realizes the interface. Example: if the interface is realized by Ethernet, then MIB Specific refers to a document that defines Ethernet objects.

Monitoring IP Routing—TCP Statistics

Device Console > Monitor > Layer 3 > IP > *TCP Statistics*

Table 95 Routing IP TCP field descriptions

Field	Description
Active Opens	The number of TCP connections that were a direct transition to the SYN-SENT state from the CLOSED state.
Passive Opens	The number of TCP connections that were a direct transition to the SYN-RCVD state from the LISTEN state.
Failed Attempts	The number of TCP connections that were a direct transition to the CLOSED state from the SYN-SENT state or the SYN-RCVD state, and a direct transition to the LISTEN state from the SYN-RCVD state.
Resets In	The number of TCP connections that made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
Segments In	The total number of segments received, including those received in error. This count includes segments received on currently established connections.
Segments Out	The total number of transmitted segments, including those on current connections, but excluding those that contain only retransmitted bytes.
Retransmitted Segments	The total number of retransmitted segments: the number of TCP segments transmitted that contain one or more previously transmitted bytes.
Segments Received with Errors	The total number of received segments, including errors. This count includes segments received on currently established connections.
Resets Out	The number of transmitted TCP segments that contain the RST flag.

Monitoring IP Routing—TCP Connections

Device Console > Monitor > Layer 3 > IP > *TCP Connections*

Table 96 Routing TCP Connections field descriptions

Field	Description
Connection State	TCP connection state
Local IP Address	The local IP Address
Local TCP Port	The local port number
Remote IP Address	The remote IP address
Remote TCP Port	The remote port number

Monitoring IP Routing—UDP Statistics

Device Console > Monitor > Layer 3 > IP > *UDP Statistics*

Table 97 Routing IP UDP field descriptions

Field	Description
Datagrams In	The total number of UDP datagrams delivered to UDP users.
No Application at Port	The total number of received UDP datagrams when no application was at the destination port.
Dropped Datagrams	The number of received UDP datagrams that could not be delivered for reasons other than the absence of an application at the destination port.
Datagrams Out	The total number of delivered UDP datagrams.

Monitoring IP Routing—UDP Information

Device Console > Monitor > Layer 3 > IP > *UDP Information*

Table 98 Routing UDP Information field descriptions

Field	Description
Local IP Address	The local IP address for the UDP listener. When the UDP listener accepts datagrams for any IP interface associated with the node, the address is 0.0.0.0.
Local UDP Port	The local port number for the UDP listener.

Monitoring IP Routing—IP Statistics

Device Console > Monitor > Layer 3 > IP > *IP Statistics*

Table 99 Routing IP Statistics field descriptions

Field	Description
Good Packets In	The number of input datagrams received from interfaces, including those received in error.
Header Error Packets In	The number of input datagrams that were discarded because of errors in the IP headers. Errors: bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, and so on.
Address Errors In	The number of input datagrams that were discarded because the IP address in the IP header's destination field was not a valid address at this switch. Invalid addresses: 0.0.0.0, addresses of unsupported Classes such as Class E, and so forth. For entities that are not IP Gateways that do not forward datagrams, the count includes datagrams that were discarded because the destination address was not a local address.
Packets Routed	The number of input datagrams for which this entity was not their final IP destination. An attempt was made to find a route to forward them to that final destination. In entities that do not act as IP Gateways, the count only includes packets that were Source-Routed via this entity, and that the Source-Route option processing was successful.
Packets In with Unknown Protocol	The number of locally-addressed datagrams that were received successfully, but were discarded because of an unknown or an unsupported protocol.
Inbound Dropped Packets	The number of input IP datagrams that were discarded, although no errors were identified. This can occur because of insufficient buffer space. **Note:** This counter does not include any datagrams that were discarded while waiting for reassembly.
Packets Consumed	The total number of input datagrams successfully delivered to IP user-protocols, including ICMP.
Packets Out	The total number of IP datagrams that local IP user-protocols, including ICMP, supplied to IP in requests for transmission. **Note:** This counter does not include any datagrams that were counted in Packets Routed.
Outbound Dropped Packets	The number of output IP datagrams that were discarded, although no problems were noted. This can occur because of insufficient buffer space. **Note:** This counter includes datagrams that were counted in Packets Routed if the packets met this discard criterion.

Table 99 Routing IP Statistics field descriptions (continued)

Field	Description
Non-Routable Dropped Packets	The number of IP datagrams discarded because no route was available for transmitting them to their destinations. **Note:** This counter includes any packets counted in Packets Routed that meet this no-route criterion. Also included, are any datagrams that a host cannot route because all of the default gateways are down.
IP Fragments Reassembled	The number of received IP fragments that needed to be reassembled.
Packet Reassembly Successes	The number of IP datagrams successfully reassembled.
Packet Reassembly Failures	The number of failures detected by the IP reassembly algorithm. Possible failures include timed out, errors, and so on. **Note:** This is not necessarily a count of discarded IP fragments. Some algorithms, notably the algorithm in RFC 815, can lose track of the number of fragments by combining them as they are received.
Successful Packet Fragmentation	The number of IP datagrams that have been successfully fragmented.
Failed Packet Fragmentation	The number of IP datagrams that have been discarded because they could not be fragmented, such as when the Don't Fragment flag has been set.
Fragments Created	The number of IP datagrams that have been fragmented.
Routing Discards	The number of dropped packets.

Monitoring IP Routing—ICMP In Statistics

Device Console > Monitor > Layer 3 > IP > *ICMP In Statistics*

Table 100 Routing IP ICMP In field descriptions

Field	Description
Packets In	The number of received ICMP messages.
Error Packets In	The number of received ICMP Time error messages.
Destination Unreachable Packets In	The number of received ICMP Destination Unreachable messages.
Time Exceeded Packets In	The number of received ICMP Time Exceeded messages.
Parameter Problem Packets In	The number of received ICMP Parameter Problem messages.
Source Quench Packets In	The number of received Internet Control Message Protocol (ICMP) Source Quench messages.
Redirect Packets In	The number of received ICMP Redirect messages.
Echo (Ping) Request Packets In	The number of received ICMP Echo (request) messages.
Echo (Ping) Reply Packets In	The number of received ICMP Echo Reply messages.
Timestamp Request Packets In	The number of received ICMP Timestamp (request) messages.
Timestamp Reply Packets In	The number of received ICMP Timestamp Reply messages.
Address Mask Request Packets In	The number of received ICMP Address Mask Request messages.
Address Mask Reply Packets In	The number of received ICMP Address Mask Reply messages.

Monitoring IP Routing—ICMP Out Statistics

Device Console > Monitor > Layer 3 > IP > *ICMP Out Statistics*

Table 101 Routing IP ICMP Out field descriptions

Field	Description
Packets Out	The total number of delivered ICMP packets.
Error Packets Out	The number of ICMP packets delivered with error messages.
Destination Unreachable Packets Out	The number of transmitted ICMP Destination Unreachable messages.
Time Exceeded Packets Out	The number of transmitted ICMP Time Exceeded messages.
Parameter Problem Packets Out	The number of transmitted ICMP Parameter Problem messages.
Source Quench Packets Out	The number of Internet Control Message Protocol (ICMP) Source Quench messages sent.
Redirect Packets Out	The number of ICMP Redirect messages sent. **Note:** For a host, this object will always be 0 (zero) since hosts do not send redirects.
Echo (Ping) Request Packets Out	The number of transmitted ICMP Echo request messages.
Echo (Ping) Reply Packets Out	The number of transmitted ICMP Echo Reply messages.
Timestamp Request Packets Out	The number of transmitted ICMP Timestamp request messages.
Timestamp Reply Packets Out	The number of transmitted ICMP Timestamp Reply messages.
Address Mask Request Packets Out	The number of transmitted ICMP Address Mask Request messages.
Address Mask Reply Packets Out	The number of transmitted ICMP Address Mask Reply messages.

Monitoring IP Routing—DNS Statistics

Device Console > Monitor > Layer 3 > IP > *DNS Statistics*

Table 102 Routing IP DNS Statistics field descriptions

Field	Description
Good DNS Requests In	The number of DNS request packets that have been received.
DNS Requests Out	The number of DNS request packets that have been transmitted.
Bad DNS Requests In	The number of DNS request packets received that were dropped.

Monitoring IP Routing—Routes

Device Console > Monitor > Layer 3 > IP > *Routes*

Table 103 Routing Routes Information field descriptions

Field	Description
Route	The index number of the routing table.
Destination IP Address	The destination IP address of this route.
Destination IP Mask	The IP mask of this route.
Next-Hop Router 1	The gateway of this route.
Tag Type	The tag type: ICMP, static, SNMP, addr, RIP, broadcast, martian, or multicast.
Route Type	The type of route: indirect, direct, local, broadcast, martian, multicast, or other.
Interface	The IP interface of this route that is used as the source IP for routing.
Route Metric	The routing metric for the route.

Monitoring IP Routing—Routes Standard

Device Console > Monitor > Layer 3 > IP > *Routes Standard*

Table 104 Routing Routes Standard Information field descriptions

Field	Description
Local Interface Index	The index value identifying the local interface through which the next hop of this route should be reached.
Destination IP Address	The destination IP address of this route. **Note**: Multiple routes to a single destination can appear in the table if the Destination IP Address has been defined by the Network Management Protocol.
Next Hop	The IP address of the next hop of this route. **Note**: If a route bound to an interface is through a broadcast media, Next Hop Address is the agent's IP address on that interface.
Route Type	The type of route: direct, indirect, invalid, or other. **Note**: The type invalid disassociates both the destination and the route entry that are identified with this entry. Management stations must be prepared to receive information from agents that correspond to entries that are not currently in use.
Route Protocol	The route protocol/mechanism via which this route was learned: other, local, netmgmt, icmp, egp, ggp, hello, rip, is-is, es-is, ciscoIgrp, bbnSpfIgp, ospf, bgp
Route Age	The number of seconds since this route was last updated or otherwise determined to be correct.
Route Mask	The mask that must be logically Ended with the destination address before it is compared to the destination address of the router. If the value of the destination address is 0.0.0.0 (default value), the mask value is also 0.0.0.0. If the system does not support arbitrary subnet masks, an agent constructs the router mask based on the class of the network of the destination address: • 255.0.0.0 for class A • 255.255.0.0 for class B • 255.255.255.0 for class C

Monitoring IP Routing—Routes Statistics

Device Console > Monitor > Layer 3 > IP > *Routes Statistics*

Table 105 Routing Routes Statistics Information field descriptions

Field	Description
IP Routes	The current number of IP routes.
Most IP Routes	The highest number of IP routes.
Maximum IP Routes	The maximum number of IP routes.

Monitoring IP Routing—ARP

Device Console > Monitor > Layer 3 > IP > *ARP*

Table 106 Routing ARP Table field descriptions

Field	Description
Destination IP Address	The destination IP address of the address resolution.
MAC Address	The MAC address for the Address Resolution Protocol (ARP) entry.
VLAN ID	The VLAN identifier for the ARP.
Source Port	The port number.
Flag	The flag status of this ARP: *clear*, *unresolved* (U), *permanent* (P), *indirect* (R), or *layer4* (p 4) (in 20.1.1.0 and higher). These flags are defined as follows: • **U**: Unresolved or unknown ARP entry. The MAC address of the client has not yet been learned. • **P**: Permanent entry created for switch IP interface. This entry never ages out. • **P 4**: Permanent entry created for Layer 4 proxy IP address or virtual server IP address. • **R**: Indirect ARP cache entry. This entry is used for faster forwarding the next time the packet comes for the same destination.

Monitoring IP Routing—ARP Statistics

Device Console > Monitor > Layer 3 > IP > *ARP Statistics*

Table 107 Routing ARP Statistics field descriptions

Field	Description
ARP Entries	The current number of ARP entries.
Most ARP Entries	The highest number of ARP entries.
Max ARP Entries	The maximum number of ARP entries.

Monitoring IP Routing—Gateway Information

Device Console > Monitor > Layer 3 > IP > *Gateway Information*

Table 108 Routing Gateway Information field descriptions

Field	Description
Gateway	The gateway index
Address	The gateway IP address
Status	The status of the gateway

Monitoring IP Routing—IP Address Information

Device Console > Monitor > Layer 3 > IP > *IP Address Information*

Table 109 Routing IP Address Information field descriptions

Field	Description
IP Address	The IP address
Interface	The index number of the interface.
IP Subnet Mask	The subnet mask of the IP address. The subnet mask is an IP address with all the network bits set to 1 and all the hosts bits set to 0.
Broadcast LSB	The broadcast address of the interface.
Maximum Reassembly Size	The size of the largest IP datagram that can be re-assembled from fragmented IP datagrams.

How to Monitor BGP Routing

Select Monitor's **Routing > BGP** category to monitor BGP Routing Statistics and Information. This section covers the following BGP Routing statistics and information topics:

Monitoring BGP Routing—BGP Peers Summary

Device Console > Monitor > Layer 3 > BGP > *Peers Summary*

Table 110 Routing BGP Peers Summary Information field descriptions

Field	Description
Remote Address	The remote IP address of this entry's BGP peer.
Peer	The BGP Identifier of this entry's BGP peer.
State	The BGP peer connection state: idle, connect, active, opensent, openconfirm or established.
Status	The BGP status: stop or start
Version	The negotiated version of BGP running between the two peers.
Local Address	The local IP address of this entry's BGP connection.
Local Port	The local port for the TCP connection between the BGP peers.
Local Autonomous System	The Local Autonomous System number.
Remote Port	The remote port for the TCP connection between the BGP peers. Note that the objects bgpPeerLocalAddr, bgpPeerLocalPort, bgpPeerRemoteAddr and bgpPeerRemotePort provide the appropriate reference to the standard MIB TCP connection table.
Remote Autonomous System	The remote autonomous system number.
Received Updates	The number of BGP UPDATE messages received on this connection. This object should be initialized to zero (0) when the connection is established.
Sent Updates	The number of BGP UPDATE messages transmitted on this connection. This object should be initialized to zero (0) when the connection is established.
Received Messages	The total number of messages received from the remote peer on this connection. This object should be initialized to zero when the connection is established.
Sent Messages	The total number of messages transmitted to the remote peer on this connection. This object should be initialized to zero when the connection is established.
Last Error	The last error code and subcode seen by this peer on this connection. If no error has occurred, this field is zero. Otherwise, the first byte of this two byte OCTET STRING contains the error code, and the second byte contains the subcode.
FSM Established	The total number of times the BGP FSM transitioned into the established state.

Table 110 Routing BGP Peers Summary Information field descriptions

Field	Description
FSM Time	This timer indicates how long (in seconds) this peer has been in the Established state or how long since this peer was last in the Established state. It is set to zero when a new peer is configured or the router is booted.
Hold Time	Time interval in seconds for the Hold Timer established with the peer.
Keep Alive	Time interval in seconds for the KeepAlive timer established with the peer.
Time Since Last Update	Elapsed time in seconds since the last BGP UPDATE message was received from the peer. Each time the bgpPeerInUpdates is incremented, the value of this object is set to zero (0).

Monitoring BGP Routing—BGP Routing Table

Device Console > Monitor > Layer 3 > BGP > *Routing Table*

Table 111 Routing BGP Routing Table field descriptions

Field	Description
Index	BGP router index.
Network	BGP network address.
Next Hop	BGP NextHop addresses from this network.
Metric	BGP metric from this network.
Local Preference	BGP local preference from this network.
Weight	Total weight of AS paths from this network.
Path	AS paths from this network.
Origin	BGP route origin from this network.

How to Monitor RIP Routing

Select Monitor's **Routing > RIP** category to monitor RIP Routing Statistics and Information. This section covers the following RIP Routing statistics and information topics:

Monitoring RIP Routing—RIP V2 Statistics

Device Console > Monitor > Layer 3 > RIP > *RIP V2 Statistics*

Table 112 Routing RIP V2 field descriptions

Field	Description
Packets Received	The number of RIPv2 packets received.
Packets Sent	The number of RIPv2 packets sent.
Requests Received	The number of RIPv2 requests received.
Responses Received	The number of RIPv2 responses received.
Requests Sent	The number of RIPv2 requests sent.
Responses Sent	The number of RIPv2 responses sent.
Route Timeouts	The number of RIPv2 route timeouts.
Bad Size Received	The number of RIPv2 packets with a bad size received.
Bad Version Received	The number of RIPv2 packets with a bad version received.
Bad Zero Received	The number of RIPv2 packets with a bad zero received.
Bad Source Port Received	The number of RIPv2 packets with a bad source port received.
Bad Source IP Received	The number of RIPv2 packets with a bad source IP received.
From Self Received	The number of RIPv2 packets received from the originating switch.

Monitoring RIP Routing—RIP Route Information

Device Console > Monitor > Layer 3 > RIP > *RIP Route Information*

Table 113 Routing RIP Route Information field descriptions

Field	Description
RIP Route Index	Index number of the RIP route.
Destination IP Address	Destination IP address for the route.
RIP Route Mask	Destination IP mask for the route
RIP Route Gateway	IP address for the next-hop router.
RIP Route Metric	Metric value for the route.

How to Monitor OSPF Routing

Select Monitor's **Routing > OSPF** category to monitor OSPF Routing Statistics and Information. This section covers the following OSPF Routing statistics and information topics:

Monitoring OSPF Routing—General OSPF Statistics

Device Console > Monitor > Layer 3 > OSPF > *General OSPF Statistics*

Table 114 Routing General OSPF field descriptions

Field	Description
Packets In	The total number of OSPF packets received for this OSPF interface.
Packets Out	The total number of OSPF packets transmitted for this OSPF interface.
Hello In	The total number of Hello packets received for this OSPF interface.
Hello Out	The total number of Hello packets transmitted for this OSPF interface.
Database Description In	The total number of Database Description packets received for this OSPF interface.
Database Description Out	The total number of Database Description packets transmitted for this OSPF interface.
Link State Request In	The total number of Link State Request packets received for this OSPF interface.
Link State Request out	The total number of Link State Request packets transmitted for this OSPF interface.
Link State Acks In	The total number of Link State Acknowledgement packets received for this OSPF interface.
Link State Acks Out	The total number of Link State Acknowledgement packets transmitted for this OSPF interface.
Link State Updates In	The total number of Link State Update packets received for this OSPF interface.
Link State Updates Out	The total number of Link State Update packets transmitted for this OSPF interface.
Neighbor Hello In	The sum total of all Hello packets received from neighbors on all OSPF areas and interfaces.
Neighbor State	The sum total number of neighbors in this state (i.e. an indication that Hello packets should now be sent to the neighbor at intervals of HelloInterval seconds), across all OSPF areas and interfaces.
Neighbor Adjoint Ok	The sum total number of decisions to be made (again) as to whether an adjacency should be established/maintained with the Neighbor across all OSPF areas and interfaces.
Neighbor Negotiation Done	The sum total number of neighbors in this state wherein the Master/slave relationship has been negotiated, and sequence numbers have been exchanged, across all OSPF areas and interfaces.

Table 114 Routing General OSPF field descriptions (continued)

Field	Description
Neighbor Exchange Done	The sum total number of neighbors in this state (i.e. in an adjacency's final state) having transmitted a full sequence of Database Description packets, across all OSPF areas and interfaces.
Neighbor Bad Link State Request	The sum total number of Link State Requests that have been received for a link state advertisement that is not contained in the database across all interfaces and OSPF areas.
Neighbor Bad Sequences	The sum total number of Database Description packets which have been received that either: • has an unexpected DD sequence number, or • has had the init bit set unexpectedly, or • has an options field differing from the last Options field received in a Database Description packet. Any of these conditions indicate that some error has occurred during adjacency establishment for all OSPF areas and interfaces.
Neighbor Loading Done	The sum total number of link state updates received for all out-of-date portions of the database across all OSPF areas and interfaces.
Neighbor Hello 1 way	The sum total number of Hello packets received from neighbors, in which this router is not mentioned across all OSPF interfaces and areas.
Neighbor Reset Adjacency	The sum total number of times the Neighbor adjacency has been reset across all OPSF areas and interfaces.
Neighbor Down	The total number of Neighboring routers down (i.e. in the initial state of a neighbor conversation) across all OSPF areas and interfaces.
Neighbor Hello 2 way	The sum total number of Hello packets received from neighbors, in which this router is mentioned across all OSPF interfaces and areas.
Interface Up	The sum total number of interfaces up in all OSPF areas.
Interface Down	The sum total number of interfaces down in all OSPF areas.
Interface Not Connected	The sum total of interfaces no longer connected to the attached network across all OSPF areas and interfaces.
Interface Connected	The sum total number of interfaces, connected to the attached network in all OSPF areas.
Interface Wait Timer Fired	The sum total number of times the Wait Timer has been fired, (indicating the end of the waiting period that is required before electing a (Backup) Designated Router) across all OSPF areas and interfaces.
Interface Backup Routers	The sum total number of Backup Designated Routers on the attached network for all OSPF areas and interfaces.
Interface Bidirectional Changes	The sum total number of changes in the set of bidirectional neighbors associated with any interface across all OSPF areas.

Table 114 Routing General OSPF field descriptions (continued)

Field	Description
Hello Timer Fired	The sum total number of times the Hello timer has been fired (which triggers the send of a Hello packet) across all OPSF areas and interfaces.
Retransmit Timer Fired	The sum total number of times the Retransmit timer has been fired across all OPSF areas and interfaces.
Link State Lock Timer Fired	The sum total number of times the LSA Lock timer has been fired across all OSPF areas and interfaces.
Link State Ack Timer Fired	The sum total number of times the LSA Ack timer has been fired across all ospf areas and interfaces.
Dbage Fired	The total number of times the Dbage has been fired.
Summary Timer Fired	The total number of times the Summary timer has been fired.
ASE Export Timer Fired	The total number of times the (Autonomous System External route) ASE Export timer has been fired.

Monitoring OSPF Routing—OSPF Area Statistics

Device Console > Monitor > Layer 3 > OSPF > *OSPF Area Statistics*

Table 115 Routing OSPF Area field descriptions

Field	Description
Index	The index of the OSPF Area for which these statistics apply.
Packets In	The total number of OSPF packets received for this OSPF interface.
Packets Out	The total number of OSPF packets transmitted for this OSPF interface.
Hello In	The total number of Hello packets received for this OSPF interface.
Hello Out	The total number of Hello packets transmitted for this OSPF interface.
Database Description In	The total number of Database Description packets received for this OSPF interface.
Database Description Out	The total number of Database Description packets transmitted for this OSPF interface.
Link State In	The total number of Link State Request packets received for this OSPF interface.
Link State Out	The total number of Link State Request packets transmitted for this OSPF interface.
Link State Ack In	The total number of Link State Acknowledgement packets received for this OSPF interface.
Link State Ack Out	The total number of Link State Acknowledgement packets transmitted for this OSPF interface.
Link State Update In	The total number of Link State Update packets received for this OSPF interface.
Link State Update Out	The total number of Link State Update packets transmitted for this OSPF interface.

Monitoring OSPF Routing—OSPF Area Neighbor Statistics

Device Console > Monitor > Layer 3 > OSPF > *OSPF Area Neighbor Statistics*

Table 116 Routing OSPF Area Neighbor Statistics

Field	Description
Index	The index of the OSPF Interface for which these statistics apply.
Hello In	The total number of Hello packets received from neighbors in this OSPF interface.
Start State	The total number of neighbors in this state (i.e. an indication that Hello packets should now be sent to the neighbor at intervals of HelloInterval seconds) in this OSPF interface.
Adjoint Okay	The total number of decisions to be made (again) as to whether an adjacency should be established or maintained with the neighbor for this OSPF interface.
Negotiated Done	The total number of neighbors in this state in which the Master/slave relationship has been negotiated, and sequence numbers have been exchanged, for this OSPF interface.
Exchange Done	The total number of neighbors in this state (i.e. in an adjacency's final state) having transmitted a full sequence of Database Description packets, for this OSPF interface.
Bad Link State Request	The total number of Link State Requests which have been received for a link state advertisement not contained in the database for this interface.
Bad Sequences	The total number of Database Description packets which have been received that either: • has an unexpected DD sequence number, or • has had the init bit set unexpectedly, or • has an options field differing from the last Options field received in a Database Description packet. Any of these conditions indicate that some error has occurred while establishing adjacency for this interface.
Loading Done	The total number of link state updates received for all out-of-date portions of the database for this OSPF interface.
Hello 1 way	The total number of Hello packets received from neighbors, in which this router is not mentioned for this OSPF interface.
Reset Adjacency	The sum total number of times the Neighbor adjacency has been reset on this interface.
Down	The total number of Neighboring routers down (i.e. in the initial state of a Neighbor conversation) for this interface.
Hello 2 Way	The total number of Hello packets received from neighbors, in which this router is mentioned in the OSPF area.

Monitoring OSPF Routing—OSPF Area Interface Statistics

Device Console > Monitor > Layer 3 > OSPF > *OSPF Area Interface Statistics*

Table 117 Routing OSPF Area Interfaces field descriptions

Field	Description
Index	The index of the OSPF Area for which these statistics apply.
Up	The total number of times the interface was up.
Down	The total number of times the interface was down.
Not Connected	The total number of times the interface was no longer connected to the attached network.
Connected	The total number of times the interface connected back to the attached network.
Wait Timer Fired	The total number of times the Wait Timer has been fired, (indicating the end of the waiting period that is required before electing a (Backup) Designated Router) for this OSPF interface.
Backup Routers	The total number of Backup Designated Routers on the attached network for this OSPF interface.
Bidirectional Changes	The total number of changes in the set of bidirectional neighbors associated with the interface for this OSPF interface.

Monitoring OSPF Routing—OSPF Area Receive Error Statistics

Device Console > Monitor > Layer 3 > OSPF > *OSPF Area Receive Error Statistics*

Table 118 Routing OSPF Area Receive Error Statistics field descriptions

Field	Description
Index	Index of the OSPF Area for which these statistics apply.
Wrong Password	Total number of packets received with a wrong password in this area.
Wrong NetMask	Total number of packets received with a wrong netmask in this area.
Wrong Hello Interval	Total number of packets received with a different hello interval in this area.
Dead Interval	Total number of packets received with a different dead interval in this area.
Options	Total number of packets received with a different options in this area.
Unknown Neighbor	Total number of packets received from an unknown neighbor in this area.
Wrong Area	Total number of packets received with a wrong area.
Invalid Self Originated LSA	The total number of packets received with invalid self originated LSAs.

Monitoring OSPF Routing—OSPF Area Interface Receive Error Statistics

Device Console > Monitor > Layer 3 > OSPF > *OSPF Area Interface Receive Error Statistics*

Table 119 OSPF Area Interface Receive Error Statistics field descriptions

Field	Description
Index	Index of the OSPF Area for which these statistics apply.
Wrong Password	Total number of packets received with a wrong password in this area.
Wrong NetMask	Total number of packets received with a wrong netmask in this area.
Wrong Hello Interval	Total number of packets received with a different hello interval in this area.
Dead Interval	Total number of packets received with a different dead interval in this area.
Options	Total number of packets received with a different options in this area.
Unknown Neighbor	Total number of packets received from an unknown neighbor in this area.
Wrong Area	Total number of packets received with a wrong area.

Monitoring OSPF Routing—OSPF Interface Change Statistics

Device Console > Monitor > Layer 3 > OSPF > *OSPF Interface Change Statistics*

Table 120 OSPF Interface Change Statistics field descriptions

Field	Description
Index	The index number.
Interface Up	The sum total number of interfaces that are up in all OSPF areas.
Interface Down	The sum total number of interfaces down in all OSPF areas.
Interface Not Connected	The sum total of interfaces no longer connected to the attached network across all OSPF areas and interfaces.
Interface Connected	The sum total number of interfaces, connected to the attached network in all OSPF areas.
Interface Wait Timer Fired	The sum total number of times the Wait Timer has been fired, (indicating the end of the waiting period that is required before electing a (Backup) Designated Router) across all OSPF areas and interfaces.
Interface Backup Routers	The sum total number of Backup Designated Routers on the attached network for all OSPF areas and interfaces.
Interface Bidirectional Changes	The sum total number of changes in the set of bidirectional neighbors associated with any interface across all OSPF areas.

Monitoring OSPF Routing—OSPF Interface Transmission Statistics

Device Console > Monitor > Layer 3 > OSPF > *OSPF Interface Transmission Statistics*

Table 121 OSPF Interface Transmission Statistics field descriptions

Field	Description
Index	The index of the OSPF Area for which these statistics apply.
Packets In	The total number of OSPF packets received for this OSPF interface.
Packets Out	The total number of OSPF packets transmitted for this OSPF interface
Hello In	The total number of Hello packets received for this OSPF interface,
Hello Out	The total number of Hello packets transmitted for this OSPF interface.
Database Description In	The total number of Database Description packets received for this OSPF interface.
Database Description Out	The total number of Database Description packets transmitted for this OSPF interface.
Link State Request In	The total number of Link State Request packets received for this OSPF interface.
Link State Request Out	The total number of Link State Request packets transmitted for this OSPF interface.
Link State Acks In	The total number of Link State Acknowledgement packets received for this OSPF interface.
Link State Acks Out	The total number of Link State Acknowledgement packets transmitted for this OSPF interface.
Link State Updates In	The total number of Link State Update packets received for this OSPF interface.
Link State Updates Out	The total number of Link State Update packets transmitted for this OSPF interface.

Monitoring OSPF Routing—OSPF Interface Neighbor Statistics

Device Console > Monitor > Layer 3 > OSPF > *OSPF Interface Neighbor Statistics*

Table 122 OSPF Interface Neighbor Statistics field descriptions

Field	Description
Index	The index of the OSPF Area for which these statistics apply.
Hello In	The total number of Hello packets received from neighbors in this OSPF interface.
Start State	The total number of neighbors in this state (i.e. an indication that Hello packets should now be sent to the neighbor at intervals of HelloInterval seconds.) in this OSPF interface.
Adjoint OK	The total number of decisions to be made (again) as to whether an adjacency should be established or maintained with the neighbor for this OSPF interface.
Negotiated Done	The total number of neighbors in this state wherein the Master/slave relationship has been negotiated, and sequence numbers have been exchanged, for this OSPF interface.
Exchange Done	The total number of neighbors in this state (i.e. in an adjacency's final state) having transmitted a full sequence of Database Description packets, for this OSPF interface.
Bad Link State Request	The total number of Link State Requests which have been received for a link state advertisement not contained in the database for this interface.
Bad Sequences	The total number of Database Description packets that have been received that either: • have an unexpected DD sequence number • unexpectedly have had the init bit set • have an options field that differs from the last Options field that was received in a Database Description packet. Any of these conditions indicate that some error has occurred during adjacency establishment for this interface.
Loading Done	The total number of link state updates received for all out-of-date portions of the database for this OSPF interface.
Hello 1 way	The total number of Hello packets received from neighbors, in which this router is not mentioned for this OSPF interface.
Reset Adjacency	The sum total number of times the Neighbor adjacency has been reset on this interface.

Table 122 OSPF Interface Neighbor Statistics field descriptions (continued)

Field	Description
Down	The total number of Neighboring routers down (i.e. in the initial state of a neighbor conversation.) for this interface.
Hello 2 Way	The total number of Hello packets received from neighbors, in which this router is mentioned in the OSPF area.

Monitoring OSPF Routing—OSPF Area Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Area Information*

Table 123 Routing OSPF Area Information field descriptions

Field	Description
Index	The OSPF area number for which the OSPF info table is related.
Area IP Address	The IP address of the OSPF area.
Interfaces	The total number of interfaces for this OSPF area.
Interfaces Up	The number of interfaces that are UP in this area.
Link State Database Entries	The number of Link State Database entries for this OSPF area.
Auth Type	Area authentication.
Accepted LS Type	LS types accepted by this area.
SPF	Number of times the SPF algorithm has been executed.
Area Border Router	Count of ABR local to this area.
AS Boundary Router	Count of ASBR local to this area.
Total Neighbors	The total number of OSPF neighbors.
INIT State	Total neighbors in INIT state.
EXCH State	Total neighbors in EXCH state.
FULL State	Total neighbors in FULL state.

Monitoring OSPF Routing—OSPF Interface Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Interface Information*

Table 124 Routing OSPF Interface Information field descriptions

Field	Description
Index	The OSPF interface number for which the OSPF info table is related.
Interface IP Address	The IP address of the OSPF interface.
Area	The index of the area in which the interface belongs.
Admin Status	Admin Status of the interface: down(0), up(1).
Passive Status	Passive status of the interface: disabled(0), enabled(1).
Router ID	The router ID of the switch.
State	The state of the interface: Down(0), Loopback(1), Waiting(2), P to P(3), DR(4), BackuDR(5), DR Other(6).
Priority	Interface router priority
Designated Router ID	The OSPF Designated Router IP (IP Address) for this OSPF interface.
Designated Router IP	The OSPF Designated Router IP Address for this OSPF interface.
Backup Designated Router ID	The OSPF Backup Designated Router IP for this OSPF interface.
Backup Designated Router IP	The OSPF Backup Designated Router IP Address for this OSPF interface.
Hello Interval	The hello timer for this OSPF interface.
Hello Interval Units	Units of time measurement for Hello interval: seconds(0), milliseconds(1)
Dead Interval	The dead timer for this OSPF interface.
Dead Interval Units	Units of time measurement for Dead interval: seconds(0), milliseconds(1)
Wait Interval	The OSPF Wait interval for this OSPF interface.
Wait Interval Units	Units of time measurement for Wait interval: seconds(0), milliseconds(1)
Retransmit Interval	The retransmit interval for this OSPF interface.
Transit Delay	The transit delay for this OSPF interface.
Total Neighbors	The total number of neighbors for this OSPF interface.
Total Events	The total number of events for this OSPF interface.

Table 124 Routing OSPF Interface Information field descriptions (continued)

Field	Description
Auth Type	Type of authentication being used: none(1) - no authentication, password(2) - use password, md5(3) - use MD5 authentication.
Point To Point Status	Point-to-point status of the interface: disabled(0), enabled(1).

Monitoring OSPF Routing—OSPF Neighbor Interface Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Neighbor Interface Information*

Table 125 Routing OSPF Neighbor Interface Information field descriptions

Field	Description
Interface	The OSPF interface number.
Neighbor	The OSPF neighbor identifier.
Priority	The priority of the OSPF neighbor.
State	The state of the OSPF neighbor: down, attempt, init, twoway, exStart, exchange, loading, full
Designated Router	IP address of the designated router for the OSPF neighbor.
Backup Designated Router	The IP Address of the backup designated router for this OSPF neighbor.
IP Address	The IP Address of the OSPF neighbor.

Monitoring OSPF Routing—OSPF Virtual Interface Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Virtual Interface Information*

Table 126 Routing OSPF Virtual Interface Information field descriptions

Field	Description
Index	The OSPF Virtual Interface number for which this table is related.
IP Address	The IP Address of this virtual interface.
Area	The index of the OSPF area to which this virtual interface belongs.
Router ID	The Router ID
State	State: disabled(0), enabled(1)
Cost	The cost of the virtual interface.
Transit Delay	The transit delay for the virtual interface.
Hello Interval	Hello interval.
Hello Interval Units	Units of time measurement for Hello interval: seconds(0), milliseconds(1)
Dead Interval	Dead interval.
Dead Interval Units	Units of time measurement for Dead interval: seconds(0), milliseconds(1)
Wait Interval	Wait interval.
Wait Interval Units	Units of time measurement for Wait interval: seconds(0), milliseconds(1)
Retransmit Interval	Retransmit interval.
Authentication	Authentication.
Events	Events
Neighbor	The IP Address of the OSPF neighbor for this virtual interface.
Neighbor State	State: down(0), attempt(1), init(2), 2 way(3), exstart(4), exchange(5), loading(6), full(7)
Area ID	The Area ID of the virtual interface.

Monitoring OSPF Routing—OSPF Stats2 Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Stats2 Information*

Table 127 Routing OSPF Stats2 Information field descriptions

Field	Description
Start Time	The time when OSPF has been started.
Up Time	The time since OSPF has been started.
Supported Types	The Link State Types that are supported.
Interfaces for Router	The number of interfaces for this router.
Virtual Links for Router	The number of virtual links for this router.
Total Neighbors	The total number of OSPF neighbors.
Neighbors in Initial State	The number of neighbors in the initial state of exchange.
Neighbors in Exchange State	The number of neighbors in the exchange state.
Neighbors in Full State	The number of neighbors in the initial state of exchange.
Areas	The total number of areas.
Transit Areas	The total number of transit areas.
NSSA Areas	The total number of NSSA areas.

Monitoring OSPF Routing—OSPF Link-State DB Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Link-State DB Information*

Table 128 Routing OSPF Link-State DB Information field descriptions

Field	Description
Area of Link-state Advertisement	The 32 bit identifier of the Area from which the Link-state Advertisement was received.
Type	The type of the link state advertisement. Each link state type has a separate advertisement format.
Link-state ID	The Link State ID is an LS Type Specific field containing either a Router ID or an IP Address; it identifies the piece of the routing domain that is being described by the advertisement.
Originating Router	The 32 bit number that uniquely identifies the originating router in the Autonomous System.
Sequence	The sequence number field is a signed 32-bit integer. It is used to detect old and duplicate link state advertisements. The space of sequence numbers is linearly ordered. The larger the sequence number the more recent the advertisement.
Age	This field is the age of the link state advertisement in seconds.
Checksum	This field is the checksum of the complete contents of the advertisement, excepting the age field. The age field is excepted so that an advertisement's age can be incremented without updating the checksum. The checksum used is the same that is used for ISO connectionless datagrams; it is commonly referred to as the Fletcher checksum.
Advertisement	The entire Link State Advertisement, including its header.

Monitoring OSPF Routing—OSPF External Link-State DB Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF External Link-State DB Information*

Table 129 Routing OSPF External Link-State DB Information field descriptions

Field	Description
Type	The type of the link state advertisement. Each link state type has a separate advertisement format.
ID	The Link State ID is an LS Type Specific field containing either a Router ID or an IP Address; it identifies the piece of the routing domain that is being described by the advertisement.
Router	The 32 bit number that uniquely identifies the originating router in the Autonomous System.
Sequence	The sequence number field is a signed 32-bit integer. It is used to detect old and duplicate link state advertisements. The space of sequence numbers is linearly ordered. The larger the sequence number, the more recent the advertisement.
Age	This field is the age of the link state advertisement in seconds.
Checksum	This field is the checksum of the complete contents of the advertisement, excepting the age field. The age field is excepted so that an advertisement's age can be incremented without updating the checksum. The checksum used is the same that is used for ISO connectionless datagrams; it is commonly referred to as the Fletcher checksum.
Advertisement	The entire Link State Advertisement, including its header.

Monitoring OSPF Routing—OSPF Summary Range Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Summary Range Information*

Table 130 Routing OSPF Summary Range Information field descriptions

Field	Description
Index	The OSPF range index.
Area	The area associated for this OSPF range.
Network	The network associated for this OSPF range.
Mask	The mask associated for this OSPF range.
Action	The action (propagate/hide) assigned to this OSPF range.
List Type	The summary address list (Non-NSSA/NSSA) assigned to this OSPF range.

Monitoring OSPF Routing—OSPF Routes Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Routes Information*

Table 131 Routing OSPF Routes Information field descriptions

Field	Description
Index	The OSPF route table index.
Destination	The destination associated with this OSPF route.
Mask	The mask associated with this OSPF route.
Via	The next hop for this OSPF route.
Type	The route type code: • IA - OSPF inter area • N1 - OSPF NSSA external type 1 • N2 - OSPF NSSA external type 2 • E1 - OSPF external type 1 • E2 - OSPF external type 2 • * - best

Monitoring OSPF Routing—OSPF Loopback Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Loopback Information*

Table 132 Routing OSPF Loopback Information field descriptions

Field	Description
Index	The OSPF interface number to which the OSPF information table is related.
Interface IP Address	The IP address of the OSPF interface.
Area	The index of the area that the interface belongs.
Admin Status	Admin Status of the interface: down(0), up(1).
Passive Status	Passive status of the interface: disabled(0), enabled(1).
Router ID	The router ID of the switch.
State	The state of the interface: Down(0), Loopback(1), Waiting(2), P to P(3), DR(4), BackuDR(5), DR Other(6).
Priority	Interface router priority.
Designated Router ID	The OSPF Designated Router IP (IP Address) for this OSPF interface.
Designated Router IP	The OSPF Designated Router IP Address for this OSPF interface.
Backup Designated Router ID	The OSPF Backup Designated Router IP for this OSPF interface.
Backup Designated Router IP	The OSPF Backup Designated Router IP address for this OSPF interface.
Hello Interval	The hello timer for this OSPF interface.
Hello Interval Units	Units of time measurement for Hello interval: seconds(0), milliseconds(1)
Dead Interval	The dead timer for this OSPF interface.
Dead Interval Units	Units of time measurement for Dead interval: seconds(0), milliseconds(1)
Wait Interval	The OSPF Wait interval for this OSPF interface.
Wait Interval Units	Units of time measurement for Wait interval: seconds(0), milliseconds(1)
Retransmit Interval	The retransmit interval for this OSPF interface.
Transit Delay	The transit delay for this OSPF interface.
Total Neighbors	The Total number of neighbours for this OSPF interface.
Total Events	The total number of events for this OSPF interface.

Table 132 Routing OSPF Loopback Information field descriptions (continued)

Field	Description
Auth Type	Type of authentication being used: none(1) - no authentication, password(2) - use password, md5(3) - use MD5 authentication.
Point To Point Status	Point-to-point status of the interface: disabled(0), enabled(1).

How to Monitor IGMP Routing

Select Monitor's **Routing > IGMP** category to monitor IGMP Routing Statistics and Information. This section covers the following IGMP Routing statistics and information topics:

Monitoring IGMP Routing—IGMP Information

Device Console > Monitor > Layer 3 > IGMP > *IGMP Information*

Table 133 Routing IGMP Information field descriptions

Field	Description
Index	Displays a numeric identifier for the IGMP instance.
Source	Displays the Source IP address of the IGMP group.
Group	Displays the IGMP group address received.
VLAN	Displays the VLAN on which the IGMP group is registered.
Trunk	The downstream trunk number.
Port	Displays the port on which the IGMP group is registered.
Version	Displays the IGMP group version.
Mode	Displays the IGMPv3 filter mode for this host (either INCLUDE, EXCLUDE, or N/A)
Expires	Displays the IGMP group expiration time.
Fwd	Displays the IGMPv3 fowarding state for this source/group IP address.

Monitoring IGMP Routing—Multicast Router Information

Device Console > Monitor > Layer 3 > IGMP > *Multicast Router Information*

Table 134 Routing IGMP MRouter Information field descriptions

Field	Description
Index	Displays a numeric identifier for the IGMP instance.
VLAN	Displays the VLAN on which the Mrouter is connected.
Port	Displays the port on which the Mrouter is connected.
Version	Displays the IGMP version.
Expires	Displays the Mrouter expiration time.
Max Query Response Time	Displays the maximum query response time interval.
Querier Robustness	The Querier Robustness value of this IGMP Mrouter.
Querier Query Interval Code	The Querier query interval code of this IGMP Mrouter.
Source IP	The source IP address of this IGMP Mrouter.

Monitoring IGMP Routing—IGMP Snooping Statistics

Device Console > Monitor > Layer 3 > IGMP > *IGMP Snooping Statistics*

Table 135 Routing IGMP Snooping Statistics field descriptions

Field	Description
VLAN	The index of the VLAN for which these statistics apply.
Received Valid Packets	Total number of valid IGMP packets received on this VLAN.
Received Invalid Packets	Total number of invalid IGMP packets received on this VLAN.
Received General Queries	Total number of IGMP General Query packets received on this VLAN.
Received Specific Queries	Total number of IGMP Group Specific Query packets received on this VLAN.
Received Leave Packets	Total number of IGMP Leave packets received on this VLAN.
Received Report Packets	Total number of IGMP Report packets received on this VLAN.
Sent Specific Queries	Total number of IGMP Group Specific Query packets transmitted on this VLAN.
Sent Report Packets	Total number of IGMP Report packets transmitted on this VLAN.
Sent Leave Packets	Total number of IGMP Leave packets transmitted on this VLAN.
Received PIM Hello Packets	Total number of PIM Hello packets received on this VLAN
Received Group Source Specific Queries	Total number of Group Source Specific queries (GSSQ) received on this VLAN
Received Current State Records	Total number of IGMP Current State records (CSRs) received on this VLAN
Received Source List Changed Records	Total number of IGMP Source List Change records (SLCRs) received on this VLAN
Received Filter Changed Records	Total number of IGMP Filter Mode Change records (FMCRs) received on this VLAN
Sent General Query Packets	Total number of IGMP General Query packets sent on this VLAN
Received Discarded Packets	Total number of IGMP packets discarded on this VLAN

How to Monitor Virtual Routing

Select Monitor's **Virtual Routing** category to monitor Virtual Routing Statistics and Information. This section covers the following Virtual Routing statistics and information topics:

Monitoring Virtual Routing Statistics

Device Console > Monitor > Layer 3 > Virtual Routing > *Virtual Routing Statistics*

Table 136 Virtual Routing field descriptions

Field	Description
VRRP Advertisements In	The total number of VRRP advertisements that were received.
VRRP Advertisements Out	The total number of VRRP advertisements that were transmitted.
Bad VRRP Advertisements	The total number of bad VRRP advertisements that were received. Bad VRRP advertisements are the advertisements that are ignored.
VRRP Bad Version	The total number of VRRP advertisements that had a bad version number.
VRRP Bad Address	The total number of VRRP advertisements that had a bad address.
VRRP Bad Password	The total number of VRRP advertisements that had a bad password.
VRRP Bad VRID	The total number of VRRP advertisements that had a bad virtual router ID.
VRRP Bad Data	The total number of VRRP advertisements that had bad data.
VRRP Bad Interval	The total number of VRRP advertisements that had a bad interval.

Monitoring Virtual Routing State

Device Console > Monitor > Layer 3 > Virtual Routing > *Virtual Routing State*

Table 137 Virtual Routing State field descriptions

Field	Description
Virtual Router Index	The index number of the VRRP virtual router.
State	The state of the VRRP virtual router, as follows: • **init** identifies the initialization state which essentially announces each VRRP participating routers parameters such as capability, priority. • **master** identifies the elected master virtual router. • **backup** identifies that the virtual router is in backup mode. • **holdoff** identifies the state when a router changes the state from backup to master.
VRRP Ownership	The ownership status of the VRRP virtual router, as follows: • **owner** identifies the preferred master virtual router. A virtual router is the owner when the IP address of the virtual router and its IP interface are the same. • **renter** identifies virtual routers which are not owned by this device.

How to Monitor Access Control Lists

Select Monitor's **Access Control List** category to monitor Access Control Lists (ACL) statistics. This section covers the following ACL statistics topics:

Monitoring ACL Statistics

Device Console > Monitor > Access Control List > *ACL Statistics*

Table 138 ACL Statistics field descriptions

Field	Description
ACL	ACL Index Number.
Total Hits	Total number of hits (matches) for the ACL.

Monitoring ACL Port Statistics

Device Console > Monitor > Access Control List > *MAC ACL Statistics*

Table 139 ACL Statistics field descriptions

Field	Description
ACL	ACL index number.
Port	Port index number.
Total Hits	Total number of hits (matches) for the ACL.

Monitoring MAC ACL Statistics

Device Console > Monitor > Access Control List > *MAC ACL Statistics*

Table 140 ACL Statistics field descriptions

Field	Description
MAC ACL No	MAC ACL index number.
MAC Match Count	Total number of matches for the ACL.
MAC ACL Stats	Total number of hits for the ACL.

Monitoring IP ACL Statistics

Device Console > Monitor > Access Control List > *IP ACL Statistics*

Table 141 ACL Statistics field descriptions

Field	Description
IP ACL No	IP ACL index number.
IP Match Count	Total number of matches for the ACL.
IP ACL Stats	Total number of hits for the ACL.

How to Monitor Fiber Channel over Ethernet (FCoE)

Select Monitor's FCoE category to view information about FCoE Initialization Protocol (FIP) Snooping information and statistics. This section covers the following topics:

Viewing FIP Snooping Port Information

Device Console > Monitor > FCoE > *FIP Snooping Port Information*

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 142 FIP Snooping Port Information field descriptions

Field	Description
Port	Port index for FIP Snooping.
ACL Sequencer	FIP sequence number for an ACL in the corresponding port.
ACL	FIP Snooping ACL entry.

Viewing FIP Snooping Statistics

Device Console > Monitor > FCoE > *FIP Snooping Statistics*

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 143 FIP Snooping Statistics field descriptions

Field	Description
Index	The index of FIP snooping statistics.
FCF Added	Number of FCF (Fiber Channel Forwarder) added to the FCoE database.
FCF Removed	Number of FCF (Fiber Channel Forwarder) removed from the FCoE database.
FCoE Connection Added	Number of FCoE connections added to the FCoE database.
FCoE Connection Removed	Number of FCoE connections removed from the FCoE database.

Viewing FIP Snooping Information

Device Console > Monitor > FCoE > *FIP Snooping Information*

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 144 FIP Snooping Information field descriptions

Field	Description
Total number of FCFs detected	The total number of FCFs detected.
Total number of FCoE connections	The total number of FCoE connections.

Viewing FIP Snooping FCF Detected Information

Device Console > Monitor > FCoE > *FIP Snooping FCF Detected*

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 145 FIP Snooping FCF Detected field descriptions

Field	Description
Index	FCF index
FCF MAC	FCF MAC address
Port	FCF port
VLAN	FCF VLAN

Viewing FIP Snooping FCoE Connections Detected Information

Device Console > Monitor > FCoE > *FIP Snooping FCoE Connections Detected*

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 146 FIP Snooping FCoE Connections Detected field descriptions

Field	Description
Index	FCoE connection index.
VN Port MAC	FCoE connection VN Port MAC.
FCF MAC	FCoE connection FCF MAC.
Port	FCoE connection Port.
VLAN	FCoE connection VLAN.

Viewing FIP Snooping VLAN Information

Device Console > Monitor > FCoE > *FIP Snooping VLAN Information*

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 147 FIP Snooping VLAN field descriptions

Field	Description
FCOE VLAN Index	The FCoE VLAN index.
Feature Index	The FCoE VLAN feature index. The feature index will accept values from 1 to the maximum SPAR ID (8) for the VLANs created by SPAR and 0 for other types of VLANs.
FCOE VLAN Creator	The FCoE VLAN Creator.
VLAN Ports	The port list information in the VLAN.

How to Monitor QoS Information

Select Monitor's **QoS** category to view information about QoS. This section covers the following topics:

Monitoring QoS Counters

Device Console > Monitor > QoS > *QoS Counters*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this information if it does not apply to your switch.

Table 148 QoS Counters field descriptions

Field	Description
Port Index	The index of the port
Queue Index	The index of the queue per port
Total Tx Packets	The total transmitted packets
Dropped Packets	The dropped packets
Total Tx Bytes	The total transmitted bytes
Dropped Bytes	The dropped bytes
Tx Packets Rate	The transmitted packets rate
Dropped Packets Rate	The dropped packets rate
Tx Bytes Rate	The transmitted bytes rate
Dropped Bytes Rate	The dropped bytes rate

How to Monitor Virtualization

Select Monitor's **Virtualization** category to view information about the association of various ports with Virtual Switch Groups, trunk groups and LACP keys, as well as VM information listing the details of all Virtual Machines discovered by the VMready switch. This section covers the following topics:

Viewing VMready Port Information

Device Console > Monitor > Virtualization > *VMready Port Info*

Note: This tab is available only for the VMready capable switches. Please disregard this information if it does not apply to your switch.

Uplink Port

This section lists all uplink (non-server) ports showing the status, Group number, Trunk number, and LACP key number.

Table 149 Uplink Port field descriptions

Field	Description
Status	Status of the uplink port. Green icon indicates Up status and Red icon indicates Down status.
Port	Alias of uplink port.
Group	Group number to which the uplink port is associated.
Trunk #	Trunk number to which the uplink port is associated.
LACP Key #	LACP key number to which the uplink port is associated.

Server Port

This section lists all server (or internal) ports showing the status, Group number, Trunk number, and LACP key number.

Table 150 Server Port field descriptions

Field	Description
Status	Status of the server ports. Green icon indicates Up status and Red icon indicates Down status.
Port	Alias of server port.
Group	Group number to which the server port is associated.
Trunk #	Trunk number to which the uplink port is associated.
LACP Key #	LACP key number to which the uplink port is associated.

Viewing VMready VM Information

Device Console > Monitor > Virtualization > *VMready VM Info*

This section lists all Virtual Machines (VMs) discovered by the switch. You can filter the Virtual Machines list based on the Virtual Switch Groups (Groups) to which they belong.

Note: This table will be blank if no VM have been discovered by the switch. This table will not be shown in the tab if Virtual Machine Groups have not been enabled on the switch.

Table 151 VMs Discovery field descriptions

Field	Description
Virtual MAC	MAC address of the Virtual Machine.
Group	Group number to which the Virtual Machine is associated.
IP Address	IP Address of the Virtual Machine.
VM Name	Name of the virtual machine discovered on the selected port. If the VM Management Server Connector is not configured, this field is blank.
Hypervisor	Name of the Hypervisor on which the VM is running. If the VM Management Server Connector is not configured, this field is blank.
VLAN	VLAN to which the Virtual Machine is associated.
Port	Server port on which Virtual Machine was discovered.

How to Monitor Edge Virtual Bridging (EVB)

Select Monitor's Virtualization > EVB category to view information about Edge Virtual Bridging (EVB) information. This section covers the following topics:

Viewing VDP TLV (VSI Discovery Protocol Type-Length-Value) Information

Device Console > Monitor > Virtualization > EVB > *VDP TLV Info*

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 152 VDP TLV Information field descriptions

Field	Description
Index	VDP Type-Length-Value (TLV) Index.
Type	TLV Type.
Length	TLV length.
TLV OUI	Organizationally Unique Identifier (OUI) associated with TLV.
Sub Type	TLV sub type.
Request	Request information.
Response	Response information.
Manager ID	Manager ID.

Viewing VSI (Virtual Station Interface) Information

Device Console > Monitor > Virtualization > EVB > *VSI Info*

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 153 VSI Information field descriptions

Field	Description
Index	VSI index number.
VSI Type ID	VSI Type ID.
Version	VSI version.
MAC Address	MAC address associated with the VSI type.
VLAN	VLAN associated with the VSI type.
Port	Port associated with the VSI type.
Tx ACL	Transmit ACL number.
Rx Entry	Receive Entry.

Viewing VM Information

Device Console > Monitor > Virtualization > EVB > *VM Info*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 154 Virtual Machine Information field descriptions

Field	Description
Index	VM index number.
VSI Type ID	VSI Type ID associated with this VM.
Version	VSI Type version information.
MAC Address	VSI MAC associated with this VM.
VLAN	VLAN associated with this VM.
Port	The VSI Port.
Tx ACL	The transmit ACL information of this VM.
Rx Info	The receiver information of this VM.
ACL Info	ACL information of this VM.
VPort	The VSI virtual port information of the active VM. A value of 0 means the VM is over the physical port but not the virtual port.

Viewing VSI DB Information

Device Console > Monitor > Virtualization > EVB > *VSI DB Info*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 155 VSI Database Information field descriptions

Field	Description
Index	VM index number.
DB Name	VSI database (DB) name.
VSI Type ID	VSI Type ID associated with this VM.
Version	VSI Type version information.
Manager ID	VSI DB Manager ID.
VLANs	VLANs associated with this VSI DB.
Tx Rate	The transmit rate.
Tx Burst	The transmit burst count.
Rx Rate	The receive rate.
Rx Burst	The receive burst count.

Viewing VSI DB ACL Information

Device Console > Monitor > Virtualization > EVB > *VSI DB ACL Info*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 156 VSI Database ACL Information field descriptions

Field	Description
Index	VM index number.
ACL	The ACL index number.
VSI Type ID	VSI Type ID.
Version	The VSI database version.
Manager ID	The VSI manager ID.
Source MAC	The source MAC address.
Source MAC Mask	The source MAC address mask.
Destination MAC	The destination MAC address.
Destination MAC Mask	The destination MAC address mask.
VLAN	The virtual LAN.
Ethernet Type	The ethernet type.
Source	The source IP address.
Source Mask	The source IP address mask.
Destination	The destination IP address.
Destination Mask	The destination IP address mask.
ToS	Type of Service.
IP Proto	The IP protocol.
TCP Flags	TCP flags.
TCP Flags Mask	TCP flags mask.
Source Port	The source port.
Source Port Mask	The source port mask.
Destination Port	The destination port.
Destination Port Mask	The destination port mask.
ACL Action	The ACL action.
New Priority	The new priority value.

How to Monitor Unified Fabric Port Information

Select Monitor's **UFP** category to view information about Unified Fabric Port (UFP). This section covers the following topics:

Monitoring CDCP Information

Device Console > Monitor > Virtualization > UFP > *CDCP Information*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 157 CDCP Information field descriptions

Field	Description
Index	The CDCP port index
Status	The CDCP port status

Monitoring Port Information

Device Console > Monitor > Virtualization > UFP > *Port Information*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 158 Port Information field descriptions

Field	Description
Index	The port index.
State	The port state information.
Virtual Ports	The virtual ports information.
Channel 1 State	The Channel 1 State.
Channel 2 State	The Channel 2 State.
Channel 3 State	The Channel 3 State.
Channel 4 State	The Channel 4 State.

Monitoring QoS Information

Device Console > Monitor > Virtualization > UFP > *QoS Information*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 159 QoS Information field descriptions

Field	Description
Port Index	The port index.
Virtual Port Index	The Virtual Port index.
Min Bandwidth per vPort	The minimum bandwidth per vPort.
Max Bandwidth per vPort	The maximum bandwidth per vPort.

Monitoring TLV Information

Device Console > Monitor > Virtualization > UFP > *TLV Information*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 160 TLV Information field descriptions

Field	Description
Index	The TLV port index.
Status	The TLV port status.

Monitoring VLAN Information

Device Console > Monitor > Virtualization > UFP > *VLAN Information*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 161 VLAN Information field descriptions

Field	Description
Index	The VLAN index.
Virtual Port List	The virtual ports list.
External Port List	The external ports list.
Internal Port List	The internal ports list.
UFP Port List	The UFP ports list.

Monitoring Virtual Port Information

Device Console > Monitor > Virtualization > UFP > *Virtual Port Information*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 162 Virtual Port Information field descriptions

Field	Description
Port Index	The port index.
Virtual Port Index	The virtual port index.
State	The virtual port state.
Mode	The virtual port mode.
SV ID	The virtual port Svid.
Default VLAN	The virtual port default VLAN.
Default Tag	The virtual port default tag.
Virtual Ports VLAN	The virtual port VLANs.
EVB Profile ID	The EVB Profile ID.

How to Monitor iSwitch Information

Select Monitor's **iSwitch** category to view information about iSwitch information. This section covers the following topics:

Viewing Port Information

Device Console > Monitor > iSwitch > *Port Information*

Table 163 Port Information field descriptions

Field	Description
Port ID	The OS port ID mapping to the distributed virtual port ID on vDS.
vDS Port ID	The distributed virtual port ID on virtual distributed switch (vDS).
Profile	The PortGroup to which the distributed virtual port ID belongs.
Connected	The name of the entity (example: VM name) connected to the port.
MAC Address	The MAC address of the entity (example: VM MAC address) connected to the port.
Host	The VMware host on which the entity (example: VM) connects to the port.
State	The status (Link Up/down/blocked) of the port.

Viewing Host Uplink Information

Device Console > Monitor > iSwitch > *Host Uplink Information*

Table 164 Host Uplink Information field descriptions

Field	Description
Host Name	The name of the VMware host.
Port ID	The OS uplink port ID.
Device Name	The name of the entity (ex: physical nic) connected to the uplink port.
State	The status (Link Up/down/blocked) of the uplink port.
MAC Address	The MAC address of the entity connected to the uplink port.
Port Group	The PortGroup to which the port ID belongs to.

How to Launch a Chart

Real-time charting facility is supported for all statistics data. The chart feature plots the trend (the difference between the previous value and the current value) of either the Absolute Value—for statistics that show Absolute, Cumulative, Average/sec, Minimum/sec, Maximum/sec and LastVal/sec (such as **Monitor > Switch > SNMP Statistics**—or the selected columnar value (such as “Bytes In” from the **Monitor > Port > Summary** page).

You can launch a chart using the following steps:

1. Select a switch and click any Monitor page showing statistics data.
2. In the statistics page, select a row that you want to plot.
3. For statistics pages showing Absolute, Cumulative values (such as **Monitor > Switch > SNMP Statistics**), click the **Chart** button to start plotting the graph.
4. For statistics pages that show only Absolute values for various parameters (such as the **Monitor > Port > Summary** page that show values for Bytes In, Bytes Out and so on), do the following:
   a. Select the column for which you want to plot the graph. You can do so by making use of the drop-down list next to Chart button.
   b. Click the **Chart** button to start plotting the graph.

Figure 62 on page 380 shows an example graph plotting the trend for the Bytes In parameter of a port.

Figure 62 Bar Chart

When plotting charts from tables of statistics that include Absolute, Cumulative, Average values (such as the **Monitor > Switch > SNMP Statistics** page), you can perform the following actions:

- Change the chart type to Bar or Line by using **Select Chart Type** drop-down list.
- You can change to a different row by using **Select Row** drop-down list.
- You can Print a snap-shot of the graph by clicking the **Print** button.

When plotting charts from tables having multiple parameters (such as the **Monitor > Port > Summary** page), you can perform the following actions:

- Change the chart type to Bar or Line by using **Select Chart Type** drop-down list.
- You can change to a different row by using **Select Row** drop-down list.
- You can change to a different column by using **Select Column** drop-down list.
- You can Print a snap-shot of the graph by clicking the **Print** button.

How to Export a Statistical Summary

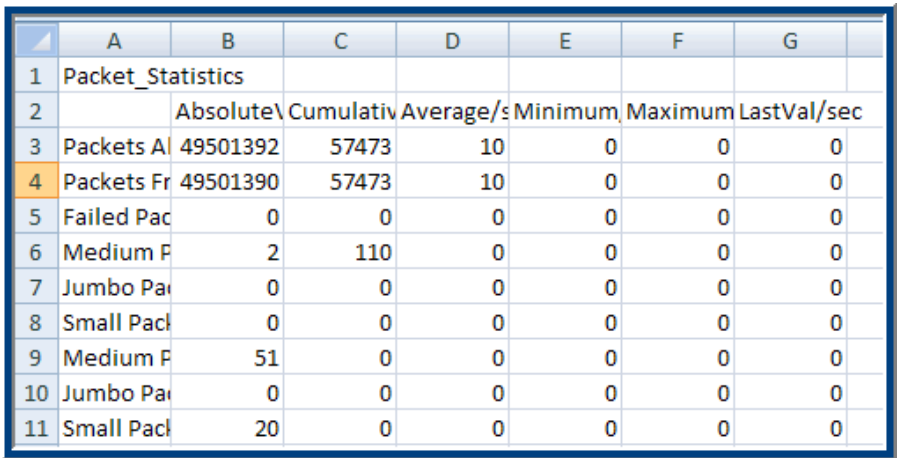
Switch Center gives you the option to export statistical data to a comma separated value (`.csv`) file that you can open in any spreadsheet program, such as Microsoft Excel or OpenOffice.

1. Select a switch.
2. Click **Monitor**.
3. Select a category, such as **Switch**.
4. Click a statistic category, such as packet statistics.
5. Click **Export** (see Figure 63 on page 381).
   a. Click **OK** to accept the default settings.
   b. Click **Save to Disk** to save the file on your computer.
   c. Click **Do this automatically for files like this from now on** to preserve your settings.

Process the file as you would any other spreadsheet. Figure 63 on page 381 shows an example of an exported spreadsheet that contains packet statistics.

Tip: If you open the spreadsheet in Microsoft Office Excel 2007, you can save the spreadsheet as an Excel 97-2003 Workbook so that Microsoft Office Excel 2003 users can open it.

Figure 63 Packet Statistics Spreadsheet example



	A	B	C	D	E	F	G
1	Packet_Statistics						
2		Absolute\	Cumulativ	Average/s	Minimum	Maximum	LastVal/sec
3	Packets Al	49501392	57473	10	0	0	0
4	Packets Fr	49501390	57473	10	0	0	0
5	Failed Pac	0	0	0	0	0	0
6	Medium P	2	110	0	0	0	0
7	Jumbo Pa	0	0	0	0	0	0
8	Small Pacl	0	0	0	0	0	0
9	Medium P	51	0	0	0	0	0
10	Jumbo Pa	0	0	0	0	0	0
11	Small Pacl	20	0	0	0	0	0

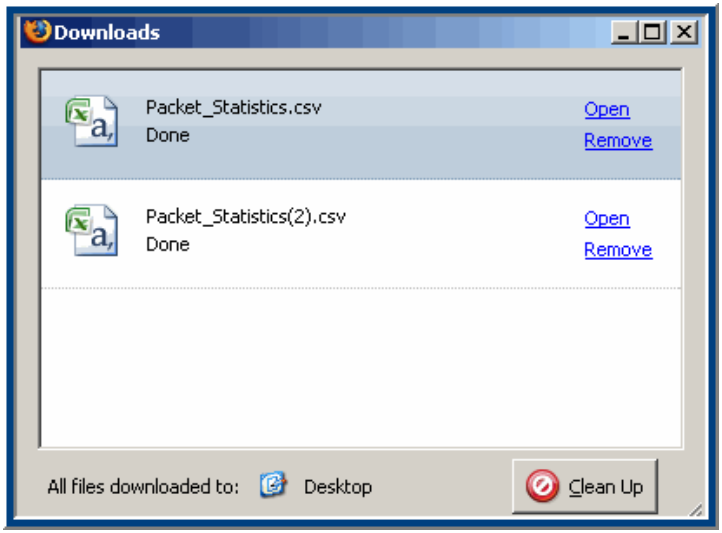
Administering Exported Files

After you export a file, Switch Center opens a window that displays the name of the exported file and the download status of the file. Click the 

icon in your task bar to open the Downloads window (see Figure 64 on page 382). You can perform the following tasks:

- Click **Open** to view the exported spreadsheet.
- Click **Remove** to delete the exported spreadsheet from your desktop.
- Click **Clean Up** to clear all information about exported files from the Downloads window.

Figure 64 Downloads window



How to Print a Statistical Summary

The statistical summary is printed in portrait format and might contain multiple pages, depending on the volume of data.

1. Select a switch.
2. Click **Monitor**.
3. Select a category, such as **Switch**.
4. Click a statistic category, such as packet statistics.
5. Click **Print.**

Configuring the Switch

Using the configuration facility in System Networking Switch Center (SNSC), you can configure various parameters of a selected switch. The configuration facility is provided as part of the Device Console page (see Figure 11 on page 88).

Note: The configuration feature is available for certain firmware versions. You can see the list of supported switch types along with the firmware version from About dialog (see “How to View Information About Switch Center” on page 129).

Note: You must be logged in using the administrator account to change switch configuration settings.

The topics in this chapter cover the following main switch configuration features:

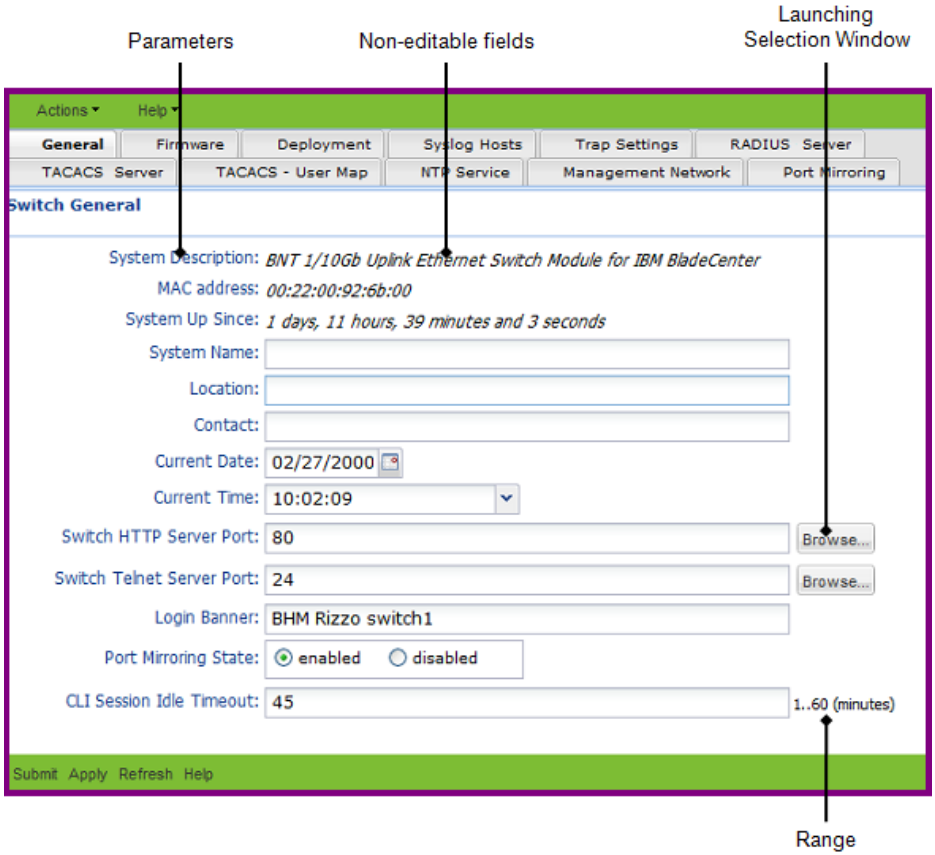
Configuration Steps

This topic covers the steps involved in configuring switch parameters:

Editing in Form Pane

The Form pane (see Figure 65 on page 388) is mainly displayed for those configurable features associated with scalar variables. You can configure the parameters either by entering new values in the text fields or by selecting the value from the drop-down list or using radio-buttons. The non configurable parameters' values are shown in italics.

Figure 65 Configuration: Form Pane

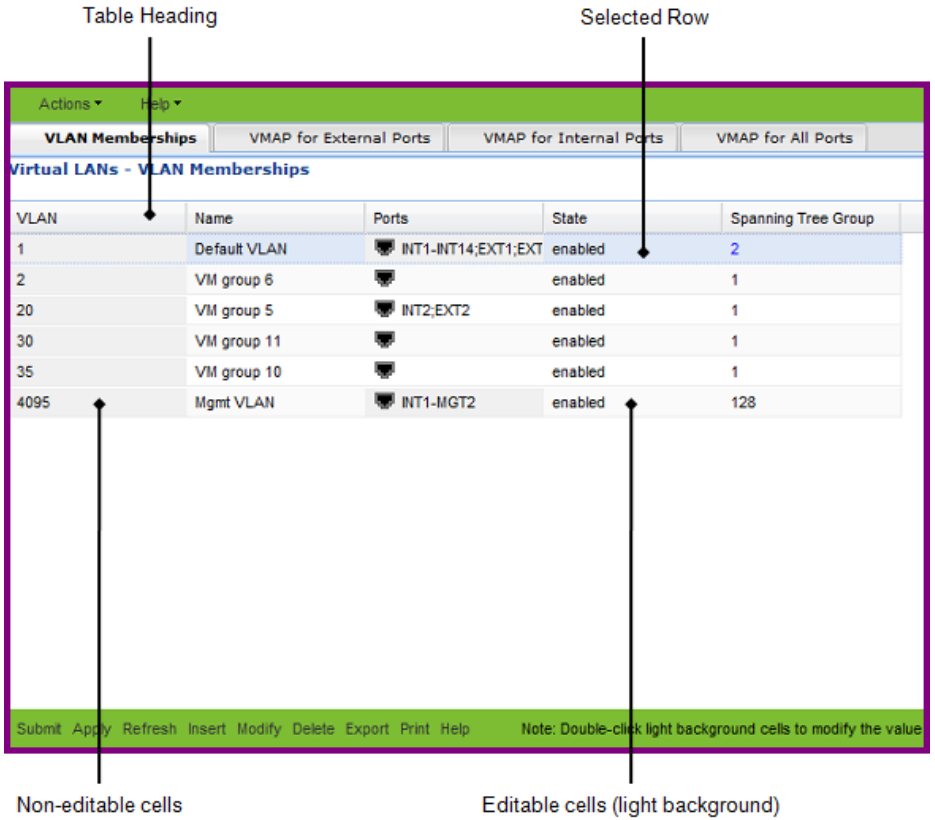


Editing in Tabular Pane

The Tabular pane (see Figure 66 on page 389) is mainly displayed for those configurable features associated with tables. Unlike form pane, tabular pane allows you to configure the parameters either through inline cell editing or in a separate window that can be launched by clicking **Modify**. While inline editing, you can configure the parameters either by entering new values in the editable cell or by selecting the value from the drop-down list associated with the cell. The non configurable parameters are shown in non-editable cells with a slightly dark background.

Note: When you modify data in a cell, the cell appears blue until the change is saved.

Figure 66 Configuration: Tabular Pane



Selection Windows

Selection windows appear throughout Switch Center's configuration panels to let you select from a list of values.

To use a Selection window:

1. Click **Browse...** beside a field that displays it. The resultant window shows the already configured value with checked check box along with a slightly dark background for the row color.
2. From the Selection window, select the desired item.
3. Some Selection windows allow for multiple selections and some only allow for one selection.
4. Click **OK**.

Submitting and Applying Changes

You can submit your changes using the following steps:

1. Click **Submit** in the bottom of form or tabular pane. By default, the **Submit** button is disabled. However, when you make an edit, it is enabled. The Submit action results in sending your changes to the switch. Note that Submit action is specific to the panel.
2. Click **Apply**. This action results in applying the changes that you had submitted in the previous step.
3. Click **Save** for saving the changes to the flash memory.
4. You can activate **Apply** and **Save** actions from any configuration panel. In other words, they are not specific to any panel.
5. Use the Save indicator located at the right top corner of the Device Console window (see Figure 11 on page 88) to decide whether **Save** should be activated or not.

About Various Configure Tabs

Some **Device Console > Configure** tabs might not be available for the selected switch. For some switch types, though the tabs are present, but some fields might not be available.Please disregard the corresponding information if it does not apply to your switch.

General Switch Configuration

The following sections describe general switch configuration tasks you can perform with Switch Center (SNSC):

General Configuration

Device Console > Configure > Switch > *General*

The following table describes the fields of the **General** configuration tab.

Table 165 Switch General Configuration field descriptions

Field	Description
System Description	Displays the product name of the switch.
Management/Switch MAC Address	MAC address of the switch.
System Up Since	Displays the date and time when the switch was last booted.
System Name	The administrative-assigned name for the managed node. You may enter the name of the device in this field to show up in the tool tip.
Location	The physical location of the node, such as telephone closet, 3rd floor.
Contact	Information about the contact person for this managed node.
Current Date	Displays the date on the real time clock.
Current Time	Displays the time on the real time clock.
Switch HTTP Server Port	Sets the TCP port number that the switch uses for any HTTP traffic. The default is port 80. Click **Browse...** to list all available TCP ports.
Switch Telnet Server Port	Sets the TCP port number that the switch uses for Telnet traffic. The default is HTTP port 23. Click **Browse...** to list all available TCP ports.
Login Banner	Displays the user-defined login banner. The message is displayed whenever you log into the switch using the Command Line Interface.
Port Mirroring State	Enables or disables the port mirroring state of the switch. The mirroring and monitoring ports are configured under the Mirror tab.
CLI Session Idle Timeout	Sets the idle timeout for CLI sessions, in minutes.
Service Required LED	Enables or disables the Service Required LED.
Logging Option	The logging option specifying whether the logging is to be done at console or not.
Login Authentication	Sets the login mechanism to local, remoteRadius or remoteTacacs.
Time Zone	Shows the configuration save status.
Telnet Access	Sets the Telnet access on the switch.
Switch Tftp Server Port	Sets the TFTP server listening port.

Table 165 Switch General Configuration field descriptions

Field	Description
System Banner	Sets the banner text.
DayLight Savings Time	Enables or disables Daylight Saving Time (DST).
Display Host in CLI Prompt	Enables or disables displaying the host name in CLI prompt.
Default IP Address on Data Interface	Enables or disables the use of default IP address on Data interface.
Default IP Address on Mgmt Interface	Enables or disables the use of default IP address on Management interface.
Default IP Address on MgmtA Interface	Enables or disables the use of default IP address on ManagementA interface.
Default IP Address on MgmtB Interface	Enable or disable the use of default IP address on ManagementB interface.
DCBX Feature	Enables or disables DCBX features.
Reminders	Enables or disables the Reminders feature.

Software Image Configuration

Device Console > Configure > Switch > *Firmware*

Use the Firmware tab to manage the switch software images. The following table describes the fields of the **Firmware** configuration tab.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 166 Switch Firmware Configuration field descriptions

Field	Description
Running Software Version	The version of the software image that is currently running on the system.
Boot Code Version	The software version of the switch boot code.
Image 1 Software Version	The software version of the image stored in the first image storage area.
Image 2 Software Version	The software version of the image stored in the second image storage area.
Image For Next Reset	Selects the software image to use during after the next reboot.
Configuration For Next Reset	Selects the configuration information to load during the next reboot.
CLI Mode for Next Reset	Selects the CLI mode used after the next reboot.
Selectable CLI Mode	Selects the next status of the CLI mode prompt.
Use BOOTP	Enables or disables the usage of BOOTP for obtaining an IP address for the switch.
Use DHCP	Enables or disables Dynamic Host Control Protocol for setting the management IP address. When enabled, the IP address obtained from the DHCP server overrides the static IP address.
Use DHCP for MGTA	Enables or disables DHCP for setting the management IP address on management port A. When enabled, the IP address obtained from the DHCP server overrides the static IP address.
Use DHCP for MGTB	Enables or disables DHCP for setting the management IP address on management port B. When enabled, the IP address obtained from the DHCP server overrides the static IP address.
Use DHCP for EXTM	Enables or disables DHCP for setting the management IP address on external management port. When enabled, the IP address obtained from the DHCP server overrides the static IP address.

Table 166 Switch Firmware Configuration field descriptions

Field	Description
Apply Pending	Indicates whether any pending changes must be applied to the switch configuration.
Save Pending	Indicates whether any applied changes to the switch configuration must also be saved.
SNMP Free Resources Timeout	The SNMP Free Resources Timeout indicates the number of minutes before the resources are freed and the state is set back to idle. Once SNMP operations that use the machine state are finished, the resources used by these operations must be freed by setting the state back to idle so that other commands can be issued via SNMP. One such operation would be an SNMP apply. This setting normally would not require modification unless you are using a MIB browser or performing debugging operations that might require a shorter or longer timeout period for SNMP operations.
Boot Profile For Next Reset	The profile to use after the next reboot.
Configuration Save Option	Indicates whether the configuration of the switch has to be saved or not.
Configuration Save File Name	The file in which the switch configuration to be saved.
Configuration Save Status	Shows the configuration save status.
Configuration Restore Option	Indicates whether the configuration of the switch has to be restored or not.
Configuration Restore File Version	The file in which the switch configuration to be restored.
Configuration Restore Status	Shows the configuration restore status.
MTM	Sets the value for Machine Type Model (MTM).

Syslog Hosts Configuration

Device Console > Configure > Switch > *Syslog Hosts*

Use the **Syslog Hosts** tab to configure where syslog messages are sent and the severity of messages to be sent.

Table 167 Syslog Hosts Configuration field descriptions

Field	Description
1st Syslog Host IP Address	The IP address of the first Syslog host. The Syslog host is where syslog messages are to be sent.
Transfer Port for 1st Syslog Host	Selects the transfer port to use for sending syslog message to first Syslog host: • DATA: Data port • EXTM: External management port • MGT, MGTA, MGTB: Internal management port
2nd Syslog Host IP Address	The IP address of the second Syslog host. The Syslog host is where syslog messages are to be sent.
Transfer Port for 2nd Syslog Host	Selects the transfer port to use for sending syslog message to second Syslog host: • DATA: Data port • EXTM: External management port • MGT, MGTA, MGTB: Internal management port
1st Syslog Host Facility	Syslog Facility: Messages are dumped from the 1st Syslog Host to the selected bucket: local0 to local7.
2nd Syslog Host Facility	Syslog Second Facility: Messages are dumped from the 2nd Syslog Host to the selected bucket: local0 to local7.
1st Syslog Host Severity	This option sets the severity level of the first syslog host displayed. The default is 7, which logs all severity levels. For a detailed description of the severity levels, see “Levels of Severity”, next. The severity levels of the 1st Syslog Host are separate from those of the 2nd Syslog Host.
2nd Syslog Host Severity	This option sets the severity level of the second syslog host displayed. The default is 7, which logs all severity levels. For a detailed description of the seven levels of severity, see “Levels of Severity”. The severity levels of the 2nd Syslog Host are separate from those of the 1st Syslog Host.
Source Loopback Interface	Sets the loopback interface used for the source IP of the Syslog message.

Table 167 Syslog Hosts Configuration field descriptions

Field	Description
Syslog Console Severity	This option sets the severity level of the syslog console. The default is 7, which logs all severity levels. For a detailed description of the seven levels of severity, see “Levels of Severity”.
Syslog Buffer Severity	This option sets the severity level of the syslog buffer. The default is 7, which logs all severity levels. For a detailed description of the seven levels of severity, see “Levels of Severity”.

Levels of Severity

All Syslog messages have a level of severity attached to them. The following table describes the severity levels.

Table 168 Syslog Severity Level descriptions

Number	Name	Description
0	Emergency	The system is unusable.
1	Alert	Take action immediately.
2	Critical	The condition of the system is critical.
3	Error	The system has errors.
4	Warning	The system is giving a warning.
5	Notice	The condition of the system is normal but with significant conditions that need attention.
6	Informational	The system is working but information about certain conditions is available.
7	Debug	The system is giving out debug-level messages.

SNMP Trap Settings

Device Console > Configure > Switch > *SNMP Trap Settings*

Use the **SNMP Trap Settings** tab to enable or disable SNMP traps on a per-feature basis. The following tables describe various fields.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 169 SNMP Trap Settings field descriptions

Field	Description
Send Authentication Traps	Enables or disables the switch to generate authentication failure traps.
UFD Trap	Enables or disables generation of Uplink Failure Detection traps.
Logging	Enables or disables syslog and email alert features.
Time Stamp	Enables or disables timestamp option.
Console	Enables or disables console logging.
System Buffers	Sets the number of log buffers to be allocated.
SNMP Trap Source Interface	SNMP Trap Source Interface

Syslog Settings

Device Console > Configure > Switch > *Syslog Settings*

Use the **Syslog Settings** tab to enable or disable Syslog messages on a per-feature basis. The following tables describe various fields.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 170 Syslog Settings field descriptions

Field	Description
Console	Enables or disables logging of messages to the console.
System	Enables or disables system level alerts.
Management (flash, config, login)	Enables or disables management (flash, config, login) alerts.
CLI	Enables or disables CLI generated error messages.
Spanning Tree	Enables or disables spanning tree-related alerts.
VLAN	Enables or disables VLAN-related alerts.
SSH	Enables or disables SSH-related alerts.
VRRP	Enables or disables VRRP-related alerts.
NTP	Enables or disables NTP-related alerts.
IP	Enables or disables IP-related alerts.
WEBUI	Enables or disables Browser Based Interface-related alerts.
OSPF	Enables or disables OSPF-related alerts.
RMON	Enables or disables RMON-related alerts.
UFP	Enables or disables UFP-related alerts.
802.1x	Enables or disables 802.1-related alerts.
Config	Enable or disable switch configuration-related syslog and SNMP traps.
Config Change	Enable or disable switch configuration change related alerts.
BGP	Enables or disables BGP-related alerts.
Hot Links	Enables or disables Hot Links-related alerts.
Server	Enables or disables Server-related alerts.
Difftrak	Enables or disables Difftrak-related alerts.
LLDP	Enables or disables LLDP-related alerts.
VM	Enables or disables VM-related alerts.

Table 170 Syslog Settings field descriptions

Field	Description
Failover	Enables or disables Failover-related alerts.
DCBX	Enables or disables DCBX-related alerts.
FCoE	Enables or disables FCoE-related alerts.
VLAG	Enables or disables VLAG-related alerts.
LACP	Enables or disables LACP-related alerts.
Link	Enables or disables Link-related alerts.
VNIC	Enables or disables VNIC-related alerts.
TFTP	Enables or disables TFTP-related alerts.
Stacking	Enables or disables Stacking-related alerts.
MLD	Enables or disables all MLD-related alerts.
IGMP Group	Enables or disables all IGMP Group-related alerts.
IGMP Mrouter	Enables or disables all IGMP Mrouter-related alerts.
IGMP Querier	Enables or disables all IGMP Querier-related alerts.
OSPFv3	Enables or disables OSPFv3-related alerts.
IPV6	Enables or disables IPv6-related alerts.

General RADIUS Configuration

Device Console > Configure > Switch > *RADIUS General*

Use the **RADIUS General** tab to configure general parameters associated with RADIUS Server.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 171 RADIUS General field descriptions

Field	Description
Ext Debug Mask	Mask for enabling or disabling the Debug/Trace prints in the RADIUS module.
Maximum Number of Users	Maximum number of User entries stored. The value of this object will be stored for the MemPool Initialization.
Secure Backdoor Status	Status of RADIUS Server Secure Backdoor. If it is enabled allow noradius user to login with admin password otherwise it won't allow noradius user to login.
Port	Specify the RADIUS port number.
Server Enabled	Flag to denote whether the server is enabled or not.
Acct Port	Specify the RADIUS Accounting port number.
Accounting Enabled	Flag to denote whether the RADIUS Accounting is enabled or not.

RADIUS Server Configuration

Device Console > Configure > Switch > *RADIUS Server*

Use the **RADIUS Server** tab to configure parameters to access RADIUS Server for authentication.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 172 RADIUS Server Settings field descriptions

Field	Description
Primary RADIUS Server IP Address	Sets the IP address for the primary RADIUS server.
Secondary RADIUS Server IP Address	Sets the IP address for the secondary RADIUS server.
Transfer Port for Primary RADIUS Server	Selects the type of port to which the primary RADIUS server is connected: • data: Data port • extm: External management port • mgt: Internal management port
Transfer Port for Secondary RADIUS Server	Selects the type of port to which the secondary RADIUS server is connected: • data: Data port • extm: External management port • mgt: Internal management port
Port	Sets the user-configurable RADIUS application port. The default is RADIUS port number 1645.
Timeout	Sets the time-out in seconds.
Retries	Sets the number of retries to the RADIUS server before timing out.
RADIUS Authentication	Enables or disables RADIUS authentication.
Primary Secret	Sets the shared secret password between the switch and the primary RADIUS server.
Secondary Secret	Sets the shared secret password between the switch and the secondary RADIUS server.
Source Loopback Interface	Sets the loopback interface used for the source IP of the RADIUS message.

Table 172 RADIUS Server Settings field descriptions

Field	Description
RADIUS Backdoor	Enables or disables access through the RADIUS backdoor. Enabling this feature allows telnet, HTTP/HTTPS, and SSH access.
Secure Backdoor	Enables or disables the RADIUS backdoor using secure password for telnet/SSH/ HTTP/HTTPS.

Note: In case of IBM System Networking Distributed Switch 5000V, the RADIUS Server Configuration is listed in a table form with the parameters listed in the following table.

Table 173 RADIUS Server Table field descriptions

Field	Description
Server Index	RADIUS server index.
Server IP Address	Sets the IP address for the given RADIUS server.
Server Type	Sets the RADIUS server type (`auth`, `acct`, `both`).
Server Secret	Sets the shared secret password between the switch and this RADIUS server.
Timeout	Sets the time-out interval, in seconds.
Retries	Set the number of retries to the RADIUS server before timing out.

General TACACS+ Configuration

Device Console > Configure > Switch > *TACACS General*

Use the **TACACS General** tab to configure general parameters associated with TACACS+ Server.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 174 TACACS General field descriptions

Field	Description
Server	The active server address. Setting this object to zero disables the active server concept.
Trace Level	The debug trace level for TACACS+ client implementation. This is bit mapped data. Each bit of this object represent a trace level as given below: 0x00000001 - Information 0x00000002 - Errors 0x00000004 - Tx. packet dump 0x00000008 - Rx. packet dump 0xffffffff - All of the above 0x00000000 - No trace
Retransmit	Number of times the TACACS+ client searches the list of TACACS+ servers.
Privilege Level	Enable/disable Cisco type privilege level mapping. By default, privilege level mapping is disabled and the privilege levels are mapped as follows: 0 = CLI_AUTH_USER 3 = CLI_AUTH_OPER 6 = CLI_AUTH_ADMIN Once the privilege level is enabled, the following privilege levels are mapped: 0 - 1 = CLI_AUTH_USER 6 - 8 = CLI_AUTH_OPER 14 - 15 = CLI_AUTH_ADMIN
Secure Backdoor Status	Status of TACACS Server Secure Backdoor.
Server Enabled	Flag to denote whether the server is enabled or not.

TACACS+ Server Configuration

Device Console > Configure > Switch > *TACACS Server*

Use the **TACACS Server** tab to configure parameters to access TACACS+ Server for authentication.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 175 TACACS+ Server Settings field descriptions

Field	Description
Primary Server	Sets the IP address for the primary TACACS+ server.
Secondary Server	Sets the IP address for the secondary TACACS+ server.
Transfer Port for Primary Server	Selects the port type to which the primary TACACS+ server is connected: • data: Data port • extm: External management port • mgt: Internal management port
Transfer Port for Secondary Server	Selects the type of port to which the secondary TACACS+ server is connected: • data: Data port • extm: External management port • mgt: Internal management port
Port	Sets the user-configurable TACACS+ application port. The default is TACACS+ port number 49.
Timeout	Sets the time-out in seconds.
Retries	Sets the number of retries to the TACACS+ server before timing out.
TACACS+ Authentication	Enables or disables TACACS+ authentication.
Password Change	Enables or disables password change.
Primary Secret	Sets the shared secret password between the switch and the primary TACACS+ server.
Secondary Secret	Sets the shared secret password between the switch and the secondary TACACS+ server.
TACACS+ Backdoor	Enables or disables access through the TACACS+ backdoor. Enabling this feature allows Telnet access and HTTP/HTTPS/SSH access.
Secure Backdoor	Enables or disables the TACACS+ backdoor using secure password for telnet/SSH/ HTTP/HTTPS.

Table 175 TACACS+ Server Settings field descriptions

Field	Description
Privilege Level Mapping	Enables or disables TACACS+ privilege-level mapping.
Command Authorization	Enables or disables command authentication.
Command Logging	Enables or disables command logging.
Directed Request	Enables or disables TACACS+ directed request.
Login Attempts	Sets the number of login attempts to the TACACS+ server.
Accounting	Enables or disables TACACS+ accounting.
Source Loopback Interface	Sets the loopback interface used for the source IP of the TACACS+ message.

Note: In case of IBM System Networking Distributed Switch 5000V, the TACACS+ Server Configuration is listed in a table form with the parameters listed in the following table.

Table 176 TACACS+ Server Table field descriptions

Field	Description
Server IP Address	Sets the IP address for the given TACACS+ server.
Server Single Connect	Enables (yes) or disables (no) server single connect.
Port	Sets the user-configurable TACACS+ application port. The default port is 49.
Timeout	Sets the time-out interval, in seconds.
Server Secret	Sets the shared secret password between the switch and this TACACS+ server.

TACACS+ User Map Configuration

Device Console > Configure > Switch > *TACACS User Map*

Use the **TACACS User Map** tab to configure TACACS User Mappings.

Note: This feature might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 177 TACACS+ User Mapping field descriptions

Field	Description
User ID	The remote privilege identifier
Mapping	The user mapping. It can be one of the following: `none`, `user`, `oper` and `admin`

TACACS+ Command Authorization Configuration

Device Console > Configure > Switch > *TACACS Command Auth*

Use the **TACACS Command Auth** tab to configure TACACS command authorization parameters.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 178 TACACS+ Command Auth field descriptions

Field	Description
Privilege Level	Privilege level associated with the CLI command.
Authorization Status	If command authorization status is true, then all commands with specified privilege level will be sent to TACACS+ server for authorization.
Accounting Status	If command accounting status is true, then all commands with specified privilege level will be sent to TACACS+ server for accounting.

LDAP Server Configuration

Device Console > Configure > Switch > LDAP Server

Use the **LDAP Server** tab to configure parameters to access LDAP Server for authentication.

Note: This tab or some fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 179 LDAP Server Settings field descriptions

Field	Description
Primary Server	Sets the IP address for the primary LDAP server.
Transfer Port for Primary Server	Selects the type of port to which the primaryLDAP server is connected: • **data**: Data port • **mgt**: Management port • **extm**: External management port
Secondary Server	Sets the IP address for the secondary LDAP server.
Transfer Port for Secondary Server	Selects the type of port to which the secondary LDAP server is connected: • **data**: Data port • **mgt**: Management port • **extm**: External management port
Port	Sets the user-configurable LDAP application port. The default is LDAP port number 389.
Timeout	Sets the time-out in seconds.
Retries	Sets the number of retries to the LDAP server before timing out.
LDAP Authentication	Enables or disables LDAP authentication.
LADP Backdoor	Enables or disables the LDAP backdoor.
Domain Name	Sets the LDAP domain name.

Network Time Protocol Configuration

Device Console > Configure > Switch > *NTP Service*

Use the **NTP Service** tab to configure Network Time Protocol settings.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 180 NTP Server Settings field descriptions

Field	Description
NTP Service	Enables or disables the Network Time Protocol (NTP) switch.
Primary NTP Service IP Address	Sets the IP address of the primary NTP server.
Secondary NTP Service IP Address	Sets the IP address of the secondary NTP server.
Transfer Port for Primary Server	Selects the type of port to which the primary NTP server is connected: • data: Data port • ext7/extm: External management port • mgt: Internal management port
Transfer Port for Secondary Server	Selects the type of port to which the secondary NTP server is connected: • data: Data port • ext7/extm: External management port • mgt: Internal management port
Server Resync Interval	Specifies how often to resynchronize the switch clock with the NTP server:
Source Loopback Interface	Sets the loopback interface used for the source IP of the NTP message.
Admin Status	Sets the Admin Status (`up, down, testing`).
Ops Poll Server	Enables (yes) or disables (no) the trigger for the NTP client to transmit a request to the designated servers.
Primary Server Key	Sets the NTP Authentication primary server key.
Secondary Server Key	Sets the NTP Authentication secondary server key.
NTP Authentication State	Sets the NTP Authentication state. Enabled=1 and Disabled=0

NTP MD5 Key Configuration

Device Console > Configure > Switch > NTP MD5 Key

Use the **NTP MD5 Key** tab to configure NTP MD5 key parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 181 NTP MD5 Key Settings field descriptions

Field	Description
Index	The index for the NTP MD5 key.
MD5 Key	The NTP MD5 key code.

Management Network Configuration

Device Console > Configure > Switch > *Management Network*

Use the **Management Network** tab to define IP address ranges allowed to manage the switch using both the data and management ports.

Table 182 Switch Management Network field descriptions

Field	Description
Index	The index for the Management Network.
IP Address	The IP address for the Management Network.
IP Mask	The IP Mask for the Management Network.

Port Mirroring Configuration

Device Console > Configure > Switch > *Port Mirroring*

Use the **Port Mirroring** tab to configure, enable, and disable the monitored port. When port mirroring is enabled, network packets being sent and/or received on a target port are duplicated and sent to a monitoring port. You can attach a network analyzer to the monitoring port to collect detailed information about your network performance and usage.

Table 183 Port Mirroring field descriptions

Field	Description
Monitoring Port	The selected port for monitoring: Receives the duplicated packets delivered by the Mirrored Port.
Mirrored Port	Sets the selected port for mirroring: Packets received by or delivered from this port are delivered to the Monitoring Port.
Direction Mirrored	This field lets you specify the direction in which packets are received by the mirrored port: • **in**: Packets received by the mirrored port. • **out**: Packets transmitted from the mirrored port. • **both**: Packets received by or transmitted from the mirrored port. It is necessary to specify the direction because: • If the source port of the frame matches the mirrored port and the mirrored direction is set to **in**, then no frame is sent to the monitor port; if the direction is set to **both**, then only packets sent out by the mirrored port are sent to monitor port. • If the destination port of the frame matches the mirrored port and the mirrored direction is set to **out**, then no frame is sent to the monitor port.

Configuration, Image, and Dump Control

Device Console > Configure > Config/Image/Dump Control > *Config/Image/Dump Control*

Use the Config/Image/Dump Control to configure an FTP, TFTP, or SFTP server required for software image or configuration upgrade/download operations, and for downloading Panic and Tech Support Dump from the switch. The following table describes the fields of the **Config/Image/Dump Control** configuration tab.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 184 Config/Image/Dump Control field descriptions

Field	Description
User Name	User name for FTP operation. If specified, the transfer mode is set to FTP. If this field is blank, the transfer mode is set to TFTP.
Password	Password required for FTP operation. Blank for TFTP mode.
Server	Domain name or IP address of the FTP/SFTP/TFTP server.
Configuration File Name	Name of the file to be used in get/put configuration action selected in the Action drop-down list.
Dump File Name	Name of the file to be used in put dump action selected in the Action drop-down list.
TS Dump File Name	Name of the file to be used in put tsdump action selected in the Action drop-down list.
Image File Name	Name of the file to be used in combination with the action selected in the Action drop-down list.
Port for Transfer	Selects the transfer port to use for config/image/dump control operation: • **data**: Data port • **extm**: External management port • **mgt**: Internal management port
Image	Selects the image file slot to use in file transfer operations that pertain to the switch image files. The choices are `image1`, `image2`, and `boot`.

Table 184 Config/Image/Dump Control field descriptions (continued)

Field	Description
Action	Select the FTP/SFTP/TFTP server action: • Image Upgrade: Downloads the file specified in the **Image File Name** field from the FTP/SFTP/TFTP server to one of the switch image slots. The image slot is specified in the Image menu. • Config Upgrade: Downloads the configuration information contained in the file specified in the **Configuration File Name** field from the FTP/SFTP/TFTP server to the switch and makes it the active switch configuration. • Config Backup: Backs up the active configuration by uploading it from the switch to the FTP/SFTP/TFTP server. The backup file name is specified in the **Configuration File Name** field. • Panic Dump: Backs up the core dump from the switch to the FTP/SFTP/TFTP server. The backup file name is specified in the **Dump File Name** field. • Image Backup: Backs up the firmware by uploading it from the switch to the FTP/SFTP/TFTP server. The backup image file name is specified in the **Image File Name** field. • Tech Support Dump: Uploads the TS dump from the switch to the FTP/SFTP/TFTP server. The TS dump file name is specified in the **TS Dump File Name** field. • bkupconfig-upgrade: Downloads the backup configuration information contained in the file specified in the **Configuration File Name** field from the FTP/SFTP/TFTP server to the switch. • bkupconfig-backup: Backs up the backup configuration by uploading it from the switch to the FTP/SFTP/TFTP server. The backup file name is specified in the **Configuration File Name** field. • activeconfig-upgrade: Downloads the active configuration information contained in the file specified in the **Configuration File Name** field from the FTP/SFTP/TFTP server to the switch. • activeconfig-backup: Backs up the active configuration by uploading it from the switch to the FTP/SFTP/TFTP server. The active backup file name is specified in the **Configuration File Name** field.
Transfer Status	The transfer status of the selected Action.
Transfer Protocol	Choose FTP, TFTP, or SFTP
Server Port [22]:	This option only applies to SFTP. The default port is 22. You may change this. This option is only valid if you select SFTP as the Transfer Protocol.

Table 185

Transfer Protocol	Choice here are among FTP/TFTP/SFTP	
Server Port [22]:	This option is applicable for SFTP only. The default port is 22. You may change this. This option comes active only if u select Transfer Protocol as SFTP.	

USB Copy

Device Console > Configure > Config/Image/Dump Control > *USB Copy*

Use the **USB Copy** tab to copy switch image, configuration, syslog and crash dump from switch flash to USB.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 186 USB Copy field descriptions

Field	Description
Operation	Select the operation: • **FromUSB** – copy from USB to Flash • **ToUSB** – copy from Flash to USB
File Name	Name of the USB file to be used for copy operation.
Flash File	Select the flash file slot to use for copy operation, as follows: boot, image1, active, syslog, and crashdump.
Transfer Status	The transfer status of the copy operation.

Configuring Access Users

The following sections describe configuration tasks you can perform for access users:

Configuring Access User

Device Console > Configure > Access User > *Access User*

Use the **Access User** tab to configure access user parameters.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 187 Access User field descriptions

Field	Description
User Identifier	The user identification number.
Class of Service	The Class of Service level for the user.
User Name	The user name.
Password	The user password. Note that <encrypted> is displayed in this field.
State	The state indicating whether the user is enabled or not.

Configuring Layer 2 Protocols

The following sections describe configuration tasks you can perform for Layer 2 protocols:

General Layer 2 Protocol Configuration

Device Console > Configure > Layer 2 > General > *General*

Use the **General** tab to configure Layer 2 protocol settings.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 188 General Layer 2 field descriptions

Field	Description
Spanning Tree State	Enables or disables Spanning Tree State.
PVST+ Compatibility	Enables or disables PVST+ compatibility mode.
VLAN Auto STG	Enables or disables VLAN automatic STG assignment.
STP Loop Guard	Enables or disables STP Loop Guard.
MAC Notification	Enables or disables MAC address Notification.

Configuring Trunks

The following sections describe trunk configuration tasks you can perform:

Trunk Hash Configuration

Device Console > Configure > Layer 2 > Trunk > *Trunk Hash*

Trunk hash parameters are set globally for the switch. Select one or two parameters, to configure any of the following valid combinations:

- SMAC (source MAC only)
- DMAC (destination MAC only)
- SIP (source IP only)
- DIP (destination IP only)
- SIP + DIP (source IP and destination IP)
- SMAC + DMAC (source MAC and destination MAC)

The following table describes the fields of the **Trunk Hash** configuration tab.

Note: Some fields might not be available for the selected switch. Please disregard field descriptions that do not apply to your switch.

Table 189 Trunk Hash field descriptions

Field	Description
Portchannel Source MAC Hash	Enable or disable trunk hashing on the source MAC.
Portchannel Destination MAC	Enable or disable trunk hashing on the destination MAC.
Portchannel Source IP Hash	Enable or disable trunk hashing on the source IP.
Portchannel Destination IP Hash	Enable or disable trunk hashing on the destination IP.
Ingress Port Hash	Enable or disable trunk hashing on the ingress port.
L4 Port Hash	Enable or disable trunk hashing on L4 port.
Use L2 for IP Hash	Enable or disable using L2 for trunk hashing.

Trunk Groups Configuration

Device Console > Configure > Layer 2 > Trunk > *Trunk Groups*

Trunk groups provide super-bandwidth, multi-link connections between switches or other trunk-capable devices. A trunk group is a group of ports that act together, combining their bandwidth to create a single, larger virtual link. For details, see your switch's Application Guide.

The following restrictions apply:

- Any physical switch port can belong to only one trunk group.
- Best performance is achieved when all ports in any given trunk group are configured for the same link parameters (speed, mode, flow control).
- Trunking from non-IBM BLADE devices must comply with Cisco® EtherChannel® technology.

The following table describes the fields of the **Trunk Groups** configuration tab.

Table 190 Trunk Groups field descriptions

Field	Description
Trunk Group	The number of the trunk group.
Ports	The physical ports in the trunk group.
State	Enables or disables the trunk group.

LACP Trunk Group Configuration

Device Console > Configure > Layer 2 > Trunk > *LACP Trunk Groups*

LACP trunk groups provide aggregation of trunk lines to have super-bandwidth, multi-link connections between switches or other trunk-capable devices. An LACP trunk group is a group of trunks that act together, combining their bandwidth to create a single, larger virtual link. For details, see your switch's Application Guide.

The following table describes the fields of the **Trunk Groups** configuration tab.

Table 191 LACP Trunk Groups field descriptions

Field	Description
LACP Trunk Group	The LACP trunk group.
Admin Key	Admin Key.

Configuring LACP

The following sections describe LACP configuration tasks you can perform:

LACP General Configuration

Device Console > Configure > Layer 2 > LACP > *LACP General*

The switch supports the IEEE 802.3ad standard. At the core of the 802.3ad standard is Link Aggregation Control Protocol (LACP). This protocol lets you to group several physical ports into one logical port (LACP trunk group) with any switch that supports IEEE 802.3ad standard (LACP). You can configure the trunk groups manually, called the static trunks, as well as you can configure trunk group using the IEEE 802.3ad standard called the LACP trunks. If more than the maximum number of ports are configured in the LACP trunk, they are put in the standby state to replace any ports that fail.

LACP automatically determines which member links can be aggregated and then aggregates them. It provides for the controlled addition and removal of physical links for the link aggregation.

The following lists LACP modes:

- *off* (default): You can configure this port in to a regular static trunk group. When the system initializes, all ports are in off mode by default.
- *active*: The port is capable of forming an LACP trunk. This port initiates negotiation with the partner system port by sending LACP packets.
- *passive*: The port is capable of forming an LACP trunk. This port only responds to the negotiation requests sent from an LACP active port.

Each LACP *active* or *passive* port must have an admin key, an operational key, and an aggregator for LACP to start negotiation on these ports. You must assign the same admin key to a group of ports to make them aggregatable. Link Aggregation ID (LAG ID) is generated internally based on the operational key. All the aggregatable ports must have the same LAG ID. You can form an active LACP trunk group with all the ports that have the same LAG ID.

The following table describes the fields of the **LACP General** configuration tab.

Table 192 LACP General field descriptions

Field	Description
Actor System Priority	Defines the priority value. Lower numbers provide higher priority.
LACPDU Timeout	Defines the timeout period before invalidating LACP data from a remote partner. You can choose between short (3 seconds) or long (90 seconds) timeout periods.

LACP Ports Configuration

Device Console > Configure > Layer 2 > LACP > *LACP Ports*

Use the **LACP Ports** tab to configure individual ports for LACP operation.

The following table describes the fields of the **LACP Ports** configuration tab.

Table 193 LACP Ports field descriptions

Field	Description
Port	The port number
Mode	The ports can be in the following modes: • off: Using this option, you can turn LACP off for this port. You can use this port to manually configure a static trunk. All ports are in off mode by default. • active: Using this option, you can turn LACP on and set this port to active. Only active ports initiate negotiation with the partner system port by sending the LACP packets. • passive: Using this option, you can turn LACP on and set this port to passive mode. Passive ports do not initiate negotiation, but only respond to the negotiation requests from active ports.
Port Priority	Sets the priority value for the selected port. Lower numbers provide higher priority.
Administrative Key	Sets the admin key for this port. Only ports with the same `admin` key and `oper` key (operational state) can form an LACP trunk group.
Minimum links	Sets the minimum links for this port.

Configuring 802.1x

The following sections describe 802.1x configuration tasks you can perform using:

General 802.1x Configuration

Device Console > Configure > Layer 2 > 802.1x > *General*

Use the **General** tab to configure 802.1x status.

Table 194 General 802.1x field descriptions

Field	Description
Status	Enables or disables 802.1x

Global 802.1x Configuration

Device Console > Configure > Layer 2 > 802.1x > *Global*

Use the **Global** tab to configure 802.1x properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 195 Global 802.1x field descriptions

Field	Description
Authentication Mode	Sets the type of access control as follows: forceUnauth, auto, forceAuth
EAP-Request/ Identity Quiet Period	Sets the wait-time interval before transmitting an EAP-Request/ Identity frame to the client after an authentication failure in the previous round of authentication.
Retransmission Period	Sets the wait time interval for an EAP-Response/Identity frame from the client before retransmitting an EAP-Request/Identity frame.
Supplicant Timeout	Sets the wait-time interval for an EAP-Response packet from the client before retransmitting the EAP-Request packet to the authentication server.
Server Authentication Request Timeout	Sets the wait-time interval for a response from the RADIUS server before declaring an authentication timeout.
Maximum Requests	Sets the maximum number of times the authenticator retransmits an EAP-Request packet to the client.
Re-authentication Period	Sets the wait-time interval before re-authenticating a client.
Re-authentication Status	Sets the re-authentication status (on or off).
Dynamic VLAN Assignment	Sets Dynamic VLAN assignment (on or off).

Guest VLAN Configuration

Device Console > Configure > Layer 2 > 802.1x > *Guest VLAN*

Use the **Guest VLAN** tab to configure 802.1x guest VLANs.

Table 196 Guest VLAN field descriptions

Field	Description
VLAN	VLAN number of the Guest VLAN.
Status	Enables or disables the Guest VLAN.

Port Configuration

Device Console > Configure > Layer 2 > 802.1x > *Port*

Use the **Port** tab to configure 802.1x port parameters.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 197 Port 802.1x field descriptions

Field	Description
Port	Port Index
Authentication Mode	Sets the access control type as follows: forceUnauth, auto, forceAuth
EAP-Request/ Identity Quiet Period	Sets the wait period before transmitting an EAP-Request/Identity frame to the client after an authentication failure in the previous round of authentication.
Retransmission Period	Sets the wait period for an EAP-Response/Identity frame from the client before retransmitting an EAP-Request/Identity frame.
Supplicant Timeout	Sets the wait period for an EAP-Response packet from the client before retransmitting the EAP-Request packet to the authentication server.
Server Authentication Request Timeout	Sets the wait period for a response from the RADIUS server before declaring an authentication timeout.
Maximum Requests	Sets the maximum number of times the authenticator retransmits an EAP-Request packet to the client.
Re-authentication Period	Sets the wait period before re-authenticating a client when periodic re-authentication is enabled.
Re-authentication Status	Sets the re-authentication status (on or off).
Dynamic VLAN Assignment	Sets Dynamic VLAN assignment (on or off).

Configuring MSTP and RSTP

The following sections describe the configuration tasks you can perform to MSTP and RSTP:

MSTP/RSTP Configuration

Device Console > Configure > Layer 2 > MSTP/RSTP > *MSTP*

Use MSTP tab to configure and manage parameters for Multiple Spanning Tree Protocol (MSTP) or to change the spanning tree mode.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **MSTP** configuration tab.

Table 198 MSTP and RSTP field descriptions

Field	Description
MSTP/RSTP	Enables or disables the bridge MSTP or RSTP.
Region's Name	Sets the region name for MST.
MST Region Revision/MST Region Version	Sets the region revision being used for MST.
Maximum Hop Count	Sets the maximum hop count value for the MST.
Spanning Tree Mode	Specifies whether MSTP, RSTP, or PVRST is being used.

Configuring CIST

The following sections describe the configuration tasks you can perform to Common and Internal Spanning Tree (CIST):

CIST Bridge Configuration

Device Console > Configure > Layer 2 > CIST > *CIST Bridge*

Use the CIST Bridge tab to configure CIST bridge parameters.

The following table describes the fields of the **CIST Bridge** configuration tab.

Table 199 CIST Bridge field descriptions

Field	Description
Bridge Priority	Sets the CIST bridge priority value.
Bridge Root Maximum Age	Sets the time (in seconds) for the maximum age of a CIST bridge root.
Bridge Root Forward Delay	Sets the time (in seconds) for a CIST bridge root forward delay.
Virtual LANs	Defines a list of VLANs associated with the CIST.

CIST Port Configuration

Device Console > Configure > Layer 2 > CIST > *CIST Port*

Use the CIST Port tab to configure CIST bridge port parameters.

The following table describes the fields of the **CIST Port** configuration tab.

Note: Some fields might not be available for the selected switch. Please disregard field descriptions that do not apply to your switch.

Table 200 CIST Port field descriptions

Field	Description
Port	Specifies the CIST bridge port being configured.
Priority	Configures the port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Path Cost	Configures the port path cost. The port path cost is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A value of 0 indicates that the default cost is computed for an auto negotiated link speed.
Link Type	Sets the port link type.
Edge Port	Enables or disables this port as an edge port.
Spanning Tree State	Enable or disables STP for this port.
Hello Time	Sets the Hello interval in seconds.
PVST Protection	Enables or disables PVST Protection for this port.

Configuring Spanning Tree Protocol

The following sections describe the configuration tasks you can perform to Spanning Tree Protocol (STP):

Spanning Tree Configuration

Device Console > Configure > Layer 2 > Spanning Tree Protocol > *Spanning Tree*

Use the Spanning Tree tab to configure STP properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **Spanning Tree** configuration tab.

Table 201 Spanning Tree Protocol field descriptions

Field	Description
Protocol Type	Displays the version of Spanning Tree Protocol, as follows: • decLb100(2) indicates the DEC LANbridge 100 Spanning Tree Protocol • ieee8021d(3) indicates IEEE 802.1d
Priority	Configures the bridge priority. The bridge priority parameter controls which bridge on the network is the STP root bridge. To make this switch the root bridge, configure the bridge priority lower than all other switches and bridges on your network. The lower the value, the higher the bridge priority.
Last Topology Change	The time since a topology change was last detected by the bridge. Time is displayed in days:hours:minutes:seconds.
Total Topology Changes	Displays total number of topology changes that were detected by the bridge.
Root Identifier	The bridge identifier of the root of the spanning tree. This value is used as the Root Identifier parameter in all the configuration bridge protocol data units (PDU) that were originated by this node.
Root Cost	The cost of the path to the root as seen from this bridge.
Root Port	The number of the port that offers the lowest cost path from this bridge to the root bridge.
Maximum Age	Configures the bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it re-configures the STP network.

Table 201 Spanning Tree Protocol field descriptions

Field	Description
Hello Interval	Configures the bridge hello time. The hello time specifies how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value. The value is entered in units of 1/100 of a second. Therefore, the default value of 2 seconds is displayed in this field as 200. The time is measured when the bridge is the root of the spanning tree (or trying to become so).
Forwarding Delay	The time for a port to change its spanning state when moving to a Forwarding state. Forwarding Delay determines how long the port stays in the Listening and Learning states that precede the Forwarding state. This value is also used for aging all dynamic entries in the Forwarding Database, after a topology change. Forwarding Delay is displayed in units of 1/100 of a second. The bridge uses this value, unless the bridge becomes the root. In that case, Forwarding Delay becomes the value that all bridges, including this one, use when this bridge becomes the root.
Root Maximum Age	Sets the Maximum bridge age. When this bridge is acting as the root, all bridges use Root Maximum Age for Maximum Age: 6 to 40 seconds. The value is entered into this field in units of 1/100 of a second. Therefore, the default value of 20 seconds is displayed in this field as 2000. Maximum Age is an integer: an error may be returned if the input value is not a whole number.
Root Hello Interval	Sets the value that all bridges use for Hello Interval when this bridge is acting as the root: 1 to 10 seconds. The value is entered into this field in units of 1/100 of a second. Therefore, the default value of 2 seconds is displayed in this field as 200. Hello Root Interval is an integer: an error may be returned if the input value is not a whole number.
Root Forwarding Delay	Sets the state change delay. When this bridge is acting as the root, all bridges use Root Forwarding Delay for Forwarding Delay: 4 to 30 seconds. The value is entered in units of 1/100 of a second. Therefore, the default value of 15 seconds is displayed in this field as 1500. Root Forwarding Delay is an integer: an error may be returned if the input value is not a whole number.
Aging Time	Sets the time-out period, in seconds, for the dynamically-learned forwarding information.
Hold Time	The time value that determines the interval length during which no more than two Configuration bridge PDUs shall be transmitted by this node, in units of 1/100 of a second.

Table 201 Spanning Tree Protocol field descriptions

Field	Description
Uplink Fast	Enables or disables Fast Uplink Convergence, which provides rapid Spanning Tree convergence to an upstream switch during failover. **Note:** When enabled, this feature increases bridge priorities to 65500 for all STGs and path cost by 3000 for all external STP ports.
Station Update Rate	Configures the station update rate, in packets per second.
BPDU Guard	Enables or disables BPDU guard, to avoid spanning-tree loops on ports with Port Fast Forwarding enabled.

STP Groups Configuration

Device Console > Configure > Layer 2 > Spanning Tree Protocol > *STP Groups*

Use the STP Groups tab to configure and maintain Spanning Tree Groups.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **STP Groups** configuration tab.

Table 202 STP Groups field descriptions

Field	Description
Index	The Spanning Tree Group (STG) index number.
State	The current state (on or off) of Spanning Tree Protocol for the Spanning Tree Group.
Priority	Configures the bridge priority. The bridge priority parameter controls which bridge on the network is the STP root bridge. To make this switch the root bridge, configure the bridge priority lower than all other switches and bridges on your network. The lower the value, the higher the bridge priority. The range is 0 to 65535, and the default is 32768 for top of rack switches and 61440 for embedded switches.
Hello Time	Configures the bridge hello time. The hello time specifies how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value. The range is 1 to 10 seconds, and the default is 2 seconds.
Forward Delay	Configures the bridge forward delay parameter. The forward delay parameter specifies the amount of time that a bridge port has to wait before it changes from the listening state to the learning state and from the learning state to the forwarding state. The range is 4 to 30 seconds, and the default is 15 seconds.
Maximum Age	Configures the bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it re configures the STP network. The range is 6 to 40 seconds, and the default is 20 seconds.
Aging Time	Configures the forwarding database aging time. The aging time specifies the amount of time the bridge waits without receiving a packet from a station before removing the station from the forwarding database. The range is 1 to 65535 seconds, and the default is 300 seconds. To disable aging, set this parameter to 0.
VLANs	Displays the VLANs in the Spanning Tree Group.

STG Port Configuration

Device Console > Configure > Layer 2 > Spanning Tree Protocol > *STG Port*

Use the STG Port tab to configure and manage STG ports.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **STG Port** configuration tab.

Table 203 STG Port field descriptions

Field	Description
Group Index	The Spanning Tree Group (STG) number.
Port	The port number that is associated with the Spanning Tree Group.
Port State	Shows the STP port state information as either on or off.
Priority	Configures the port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Path Cost	Configures the port path cost. The port path cost is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A value of 0 indicates that the default cost is computed for an auto negotiated link speed.
Port Link Type	Sets the port link type.
Port Edge State	Enables or disables this port as an edge port.
Fast Forwarding	Enables or disables Port Fast Forward on the port.

Configuring Forwarding Database

The following sections describe the configuration tasks you can perform to Forwarding Database (FDB):

FDB General Configuration

Device Console > Configure > Layer 2 > Forwarding Database > *FDB General*

Use the FDB General tab to configure general FDB properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **FDB General** configuration tab.

Table 204 Forwarding Database General field descriptions

Field	Description
FDB Aging|Value	Configures the aging value for FDB entries.
FDB Learning	Enables or disables the process of learning FDB entries.
Flooding	Enables or disables FDB flooding.

FDB Static Configuration

Device Console > Configure > Layer 2 > Forwarding Database > *FDB Static*

Use the **FDB Static** tab to configure static entries in the FDB.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **FDB Static** configuration tab.

Table 205 Forwarding Database Static field descriptions

Field	Description
Index	Configures the FDB entry number.
MAC Address	Configures the MAC address of the static FDB entry.
VLAN	Configures the VLAN number of the static FDB entry.
Port	Configures the port number of the static FDB entry. This field applies only if the Type is set to `port`.
Type	Sets the type (`port, trunk, adminkey`).
Trunk	Configures the trunk number. This field applies only if the Type is set to `trunk`.
Adminkey	Configures the LACP **adminkey**. This field applies only if the Type is set to `adminkey`.

FDB Static Multicast Configuration

Device Console > Configure > Layer 2 > Forwarding Database > *Static Multicast*

Use the **Static Multicast** tab to configure FBD static multicast entries.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 206 FDB Static Multicast field descriptions

Field	Description
Index	Configures the FDB entry number.
MAC Address	Configures the MAC address of the static multicast FDB entry.
VLAN	Configures the VLAN number of the static multicast FDB entry.
Ports	Configures the port numbers of the static multicast FDB entry.

Configuring Virtual Link Aggregation Groups

The following sections describe the configuration tasks associated with Virtual Link Aggregation Groups (VLAGs):

General Configuration

Device Console > Configure > Layer 2 > VLAG > *General*

Use the **General** tab to configure general VLAG properties.

Table 207 VLAG General field descriptions

Field	Description
System Priority	Sets the VLAG priority for the switch used for election of Primary and Secondary VLAG switches.
Tier ID	Sets the VLAG Tier ID.
StartUp Delay Interval	Sets the VLAG startup Delay Timer interval.
Global State	Enables or disables VLAG globally on the switch.
Auto Recovery Interval	Sets the vLAG Auto Recovery Timer interval. The Timer prevents all vLAG ports from staying in `ErrDisabled` state when booting two vLAG switches but one cannot be up.

Health Check Configuration

Device Console > Configure > Layer 2 > VLAG > *Health Check*

Use the Health Check tab to set VLAG health check parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch. .

Table 208 VLAG Health Check field descriptions

Field	Description
Peer IP Address	Sets the IP address of the peer switch used for health checks.
Peer IPv6 Address	Sets the IPV6 address of the peer switch used for health checks.
Connect Retry Interval	Sets the interval at which the retry attempt will be made to connect to the peer.
Attempts	Sets the number of keep-alive attempts.
Interval	Sets the interval between keep-alive messages sent during health checks.

Trunk Configuration

Device Console > Configure > Layer 2 > VLAG > *Trunk*

Use the **Trunk** tab to configure VLAG trunk groups.

Table 209 VLAG Trunk field descriptions

Field	Description
Trunk Groups	Sets the trunk group as VLAG.
State	Enables or disables VLAG for this trunk group.

LACP Configuration

Device Console > Configure > Layer 2 > VLAG > *LACP*

Use the **LACP** tab to configure LACP trunks for VLAG.

Table 210 VLAG LACP field descriptions

Field	Description
LACP Admin Key	Sets the LACP *admin key*.
State	Enables or disables LACP *admin key*.

Inter-Switch Link (ISL) Configuration

Device Console > Configure > Layer 2 > VLAG > *ISL*

Use the **ISL** tab to configure Inter-Switch Links for VLAG.

Table 211 VLAG ISL field descriptions

Field	Description
Trunk	Sets the trunk group for the VLAG Inter-Switch Link (ISL).
Admin Key	Sets the LACP *admin key* for the VLAG Inter-Switch Link.

Configuring Hot Links

The following sections describe the configuration tasks associated with Hot Links:

Hot Links General Configuration

Device Console > Configure > Layer 2 > Hot Links > *General Configuration*

Use the General Configuration tab to configure general Hot Links properties.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Hot Links** General Configuration tab.

Table 212 Hot Links General field descriptions

Field	Description
Hot Links	Enables or disables Hot Links.
FDB Update	Enables or disables Hot Links FDB Update.
FDB Update Rate	Sets FDB update rate in packets per second.
BPDU Flood	Enables or disables Hot Links BPDU Flooding.

Hot Links Triggers Configuration

Device Console > Configure > Layer 2 > Hot Links > *Triggers*

Use the Triggers tab to configure Hot Links triggers.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Triggers** tab.

Table 213 Hot Links Triggers field descriptions

Field	Description
Trigger ID	The trigger identifier.
Name	The trigger name.
State	Enables or disables Trigger state.
Preemption State	Enables or disables Preemption state.
Forward Delay	Forward Delay setting, in seconds.
Master Port	The master interface port number.
Master Trunk	The master interface trunk number.
Master Adminkey	The master interface *admin key* number.
Backup Port	The backup interface port number.
Backup Trunk	The backup interface trunk number.
Backup Adminkey	The backup interface *admin key* number.

Configuring Virtual LANs

The following sections describe the configuration tasks associated with Virtual LANs (VLANs):

VLAN Memberships Configuration

Device Console > Configure > Layer 2 > Virtual LANs > *VLAN Memberships*

Use Virtual Local Area Networks (VLANs) to split up groups of network users into manageable broadcast domains, to create logical segmentation of workgroups, and to enforce security policies among logical segments.

Note: All ports must belong to at least one VLAN. Any port which is removed from a VLAN and which is not a member of any other VLAN is automatically added to default VLAN 1. A port cannot be removed from VLAN 1 if the port has no membership in any other VLAN. Also, a port cannot be part of more than one VLAN unless it is configured for VLAN tagging.

Use the VLAN Memberships General tab to configure general VLAN properties.

The following table describes the fields of the **VLAN Memberships** configuration tab.

Table 214 VLAN Memberships field descriptions

Field	Description
VLAN	The VLAN identification number. The number can be set when a VLAN is inserted or modified.
Name	The VLAN name. The default is none, except for the first VLAN name, which has a default name of Default VLAN.
Ports	The ports in the VLAN. The default is none except for VLAN 1. By default, all ports belong to VLAN 1. To select the ports belonging to the VLAN group by Click **Ports...** or double-click on the ports column in the table to select the ports belonging to the VLAN group.
State	Enables or disables a VLAN.
Spanning Tree Group	The Spanning Tree Group (STG) assigned to the VLAN. To choose an STG, double-click on the field. Then right-click to select **Browse...**
Management State	Enables or disables Management VLAN.
Virtual Ports	Displays a list of configured virtual ports in the VLAN.

Private VLAN Configuration

Device Console > Configure > Layer 2 > Virtual LANs > *Private VLAN*

Use this feature to configure Private VLANs.

Table 215 Private VLAN field descriptions

Field	Description
VLAN	The VLAN ID configured as Private VLAN.
VLAN Type	The VLAN type, as follows: none, primary, isolated, community
Primary VLAN	Sets Private VLAN mapping between a primary and a secondary VLAN.
State	Enables or disables Private VLAN.

Protocol VLAN Configuration

Device Console > Configure > Layer 2 > Virtual LANs > *Protocol VLAN*

Use this feature to configure Protocol VLANs (PVLANs).

Table 216 Protocol VLAN field descriptions

Field	Description
VLAN	The VLAN ID configured as Protocol VLAN.
Protocol VLAN Identifier	Sets the priority value for this PVLAN.
Frame Type	Sets the frame type for the selected protocol.
Ether Type	Sets the ether type for the selected protocol.
Predefined Protocol	Sets the predefined protocol.
Priority	Sets the protocol priority.
State	Enables or disables the selected protocol on the VLAN.
Ports	List of ports belongs to the selected protocol on this VLAN.
Tagged Ports	List of ports that will be tagged by the selected protocol on this VLAN.

VMAP Configuration for Non-Server Ports

Device Console > Configure > Layer 2 > Virtual LANs > *VMAP for Non Server Ports*

Use this feature to add or remove a VLAN Map to non-server ports.

Note: This tab is available only for VMready capable switches. Please disregard this information if it does not apply to your switch.

Table 217 VMAP for Non-Server Ports field descriptions

Field	Description
VLAN ID	The VLAN Id.
VMAP	List of VLAN Maps

VMAP Configuration for Server Ports

Device Console > Configure > Layer 2 > Virtual LANs > *VMAP for Server Ports*

Use this feature to add or remove a VLAN Map to server ports.

Note: This tab is available only for VMready capable switches. Please disregard this information if it does not apply to your switch.

The following table describes the fields of the **VMAP for Server Ports** configuration tab.

Table 218 VMAP for Server Ports field descriptions

Field	Description
VLAN ID	The VLAN Id.
VMAP	List of VLAN Maps

VMAP Configuration for All Ports

Device Console > Configure > Layer 2 > Virtual LANs > *VMAP for All Ports*

Use this feature to add or remove a VLAN Map to External and Internal ports.

Note: This tab is available only for VMready capable switches. Please disregard this information if it does not apply to your switch.

The following table describes the fields of the **VMAP for All Ports** configuration tab.

Table 219 VMAP for All Ports field descriptions

Field	Description
VLAN ID	VLAN identifier.
VMAP	List of VLAN Maps

Configuring Link Layer Discovery Protocol (LLDP)

The following sections describe the configuration tasks associated with LLDP:

LLDP General Configuration

Device Console > Configure > Layer 2 > LLDP > *General*

Use the LLDP General tab for enabling or disabling LLDP state and configuring general parameters.

Note: This tab or some fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 220 LLDP General field descriptions

Field	Description
LLDP State	Enable or disable LLDP state.
Transmission Interval	Sets the message transmission interval in seconds.
Holdtime Multiplier	Sets the message hold time multiplier.
Notification Interval	Sets the trap notification interval, in seconds.
Transmission Delay	Sets the message transmission delay, in seconds.
Reinitialization Delay	Sets the re-initialization delay, in seconds.

LLDP Port Configuration

Device Console > Configure > LLDP > *LLDP Port*

Use the LLDP Port tab to enable or disable EDCP TLV State of the ports.

Note: This tab is available only for LLDP capable switches. Please disregard this information if it does not apply to your switch.

Table 221 LLDP Port field descriptions

Field	Description
Port	Port number.
Admin Status	Enables or disables the admin status of the LLDP port.
SNMP Trap Notification	Enables or disables the SNMP trap notification state of the LLDP port.
Port Description TLV State	Enables or disables Port Description TLV state of the LLDP port.
System Name TLV State	Enables or disables System Name TLV state of the LLDP port.
System Description TLV State	Enables or disables System Description TLV state of the LLDP port.
System Capabilities TLV State	Enables or disables System Capabilities TLV state of the LLDP port.
Management Address TLV State	Enables or disables Management Address TLV state of the LLDP port.
Port VLAN ID TLV State	Enables or disables Port VLAN ID TLV state of the LLDP port.
Port-Protocol VLAN ID TLV State	Enables or disables Port and Protocol VLAN ID TLV state of the LLDP port.
VLAN Name TLV State	Enables or disables VLAN Name TLV state of the LLDP port.
Protocol Identity TLV State	Enables or disables Protocol Identity TLV state of the LLDP port.
MAC/PHY Config/ Status TLV State	Enables or disables MAC/PHY Configuration/Status TLV state of the LLDP port.
Power Via MDI TLV State	Enables or disables Power Via MDI TLV state of the LLDP port.
Link Aggregation TLV State	Enables or disables Link Aggregation TLV state of the LLDP port.
Maximum Frame Size TLV State	Enables or disables Maximum Frame Size TLV state of the LLDP port.

Table 221 LLDP Port field descriptions

Field	Description
EDCP TLV State	Enables or disables EDCP TLV state.
ALL LLDP Ports State	Set the corresponding state for all the LLDP port's TLVs.
DCBX TLV State	Enables or disables DCBX TLV state of the LLDP port.

Port Global TLV State

Device Console > Configure > Layer 2 > LLDP> *Port Global TLV State*

Use the **Port Global TLV State** tab to set LLDP port's TLV state.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 222 Port Global TLV State field descriptions

Field	Description
Port	The port index.
Global TLV State	Select the global TLV state for the port.

Configuring Failover

The following sections describe the tasks associated with Failover configuration:

General Configuration

Device Console > Configure > Layer 2 > Failover > *General*

Use the **General** tab to enable or disable Layer 2 Failover.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 223 Failover General Configuration field descriptions

Field	Description
Failover State	Enables or disables Failover.
VLAN State	Enables or disables Failover VLAN Monitor.

Triggers Configuration

Device Console > Configure > Layer 2 > Failover > *Trigger*

Use the **Trigger** tab to set Failover Triggers.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 224 Failover Triggers field descriptions

Field	Description
Trigger Identifier	The Failover trigger identifier.
State	Enables or disables the trigger state.
Limit	Sets the minimum number of operational links allowed within each trigger before the trigger initiates a failover event.
	Auto Monitor (AM)
AM Trunk	Adds a trunk group to the Auto Monitor port configuration.
AM Key	Adds a LACP admin key to the Auto Monitor.
	Manual Monitor (MM)
MM Port	Adds the selected port to the Manual Monitor port configuration.
MM Trunk	Adds a trunk group to the Manual Monitor port configuration.
MM Key	Adds an LACP admin key to the Manual Monitor.
	Manual Control (MC)
MC Port	Adds the selected port to the Manual Control port configuration.
MC Trunk	Adds a trunk group to the Manual Control port configuration.
MC Key	Adds an LACP admin key to the Manual Control.

Configuring Active Multipath Protocol (AMP)

The following sections describe the configuration tasks associated with Active Multipath Protocol (AMP):

General Configuration

Device Console > Configure > Layer 2 > AMP > *General*

Use the **General** tab to configure AMP properties.

Table 225 AMP General field descriptions

Field	Description
AMP State	Globally enables or disables Active Multipath Protocol (AMP).
Switch Type	Sets the active multipath switch type to access or aggregator.
Switch Priority	Sets the AMP priority for the switch. A lower priority value denotes a higher precedence. It is recommended that aggregator switches be configured with lower priority values than access switches.
Keep Alive Interval	Sets the time interval between AMP keep alive messages.
Keep Alive Timeout Count	Sets the timeout count, which is the number of unreceived keep-alive packets the switch waits before declaring a timeout due to loss of connectivity with the peer.
Aggregator Link Type	Sets the Aggregator Link Type as follows: port, trunk, lacp
Aggregator Link Id	Sets the consistent value for Aggregator Link Type.

Group Configuration

Device Console > Configure > Layer 2 > AMP > *Group*

Use the **Group** tab to configure AMP groups.

Table 226 AMP Group field descriptions

Field	Description
Index	AMP Group Index.
State	Enables or disables AMP Group.
First Link Type	Sets First AMP Link Type as follows: none, port, trunk, lacp
First Link Id	Sets the consistent value for First Link type.
Second Link Type	Sets Second AMP Link Type as follows: none, port, trunk, lacp
Second Link Id	Sets the consistent value for Second Link type.

Configuring Edge Control Protocol (ECP)

The following sections describe the configuration tasks associated with ECP:

ECP General Configuration

Device Console > Configure > Layer 2 > ECP > *General*

Use the **General** tab to configure ECP properties.

Note: This tab is available only for ECP-capable switches. Please disregard this information if it does not apply to your switch.

Table 227 ECP General field descriptions

Field	Description
Retransmission Interval	Sets ECP retransmission interval in milliseconds.

Configuring IP Interfaces

The following sections describe the configuration tasks associated with IP interfaces:

IP General Configuration

Device Console > Configure > Layer 3 > IP > *General*

Use the **General** tab to set the Router ID.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

IP Interfaces Configuration

Device Console > Configure > Layer 3 > IP > *Interfaces*

Use the IP Interfaces tab to configure IP Interfaces.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **IP Interfaces** tab.

Table 228 IP Interfaces field descriptions

Field	Description
Index	Index number of the interface.
MTU	Sets the maximum transmission unit (MTU) for the interface.
Admin Status	Sets the administrative status (`up, down, testing`).
Port Name	Sets the port name (alias).
IP Interface	The IP interface number. This number can be set when an IP interface is inserted.
Address	The IP address of the interface in IPv4 interfaces.
Mask	The subnet mask of the interface in IPv4 interfaces.
VLAN	The VLAN associated with the interface. Each interface can belong to one VLAN, although any VLAN can have multiple IP interfaces associated with it.
State	Enables or disables the state of the interface.
Boot Relay	Enables or disables the BOOTP relay.

IP Forwarding Configuration

Device Console > Configure > Layer 3 > IP > *Forwarding*

Use the Forwarding tab to configure IP Forwarding.

Table 229 IP Forwarding field descriptions

Field	Description
Forwarding State	Sets the forwarding state (on or off).
Directed Broadcasts	Enables or disables directed broadcasts.
ICMP Redirects	Enables or disables ICMP Redirects.
ICMPv6 Redirects	Enables or disables ICMPv6 Redirects.

Network Filters Configuration

Device Console > Configure > Layer 3 > IP > *Network Filters*

Use this tab to configure network filters.

Table 230 Network Filters field descriptions

Field	Description
Index	The index number of the network filter.
Address	Sets the IP address.
Mask	Sets the IP subnet mask.
State	Enables or disables the network filter.

Loopback Interfaces Configuration

Device Console > Configure > Layer 3 > IP > *Loopback Interfaces*

Use this tab to configure loopback interfaces.

Table 231 Loopback Interfaces field descriptions

Field	Description
Index	The index number of the loopback interface.
Address	Sets the IP address.
Mask	Sets the IP subnet mask.
State	Enables or disables the loopback interface.

Static ARP Configuration

Device Console > Configure > Layer 3 > IP > *Static ARP*

Use this tab to configure static ARP entries.

Table 232 Static ARP field descriptions

Field	Description
Index	The index number of the static ARP entry.
Interface	Sets the IP interface for the entry.
Address	Sets the IP address of the entry.
MAC Address	Sets the MAC address for the entry.

Configuring Gateways

The following sections describe the configuration tasks associated with gateways:

Gateways Configuration

Device Console > Configure > Layer 3 > Gateways > *Gateways*

Use the Gateways tab to configure gateways.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Gateways** tab.

Table 233 Gateways field descriptions

Field	Description
Index	The gateway index number.
IP Address	Sets the IPv4 address of the default gateway.
Interval	Sets the interval between ping attempts.
Retries	Sets the number of failed attempts to declare the default gateway down.
State	Enables or disables the default gateway.
ARP	Enables or disables the Address Resolution Protocol health checks.

Configuring Routes

The following sections describe the tasks associated with Routes configuration:

General Configuration

Device Console > Configure > Layer 3 > Routes > *General*

Use the **General** tab to configure Routes health check and hash parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 234 Routes General Configuration field descriptions

Field	Description
Ping Interval for ECMP Health Check	Sets the ECMP health-check ping interval, in seconds.
Retries for ECMP Health Check	Sets the number of ECMP health-check retries.
ECMP Hash	Sets ECMP hashing parameters: dipsip, sip
Gateway Health Check	Enables or disables Gateway health-check functionality.

IP Static Routes Configuration

Device Console > Configure > Layer 3 > Routes > *IP Static Routes*

Use the **IP Static Routes** tab to configure Static Routes.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 235 IP Static Routes Configuration field descriptions

Field	Description
Index	The index of the static routing table.
Destination IP	Sets the destination IP address for this route.
Subnet Mask	Sets the subnet mask for this route.
Gateway	Sets the IP address of the gateway for this route.
Route IP Interface	Sets the IP interface for this route.

IPMC Ports Configuration

Device Console > Configure > Layer 3 > Routes > *IPMC Ports*

Use the **IPMC Ports** tab to configure IPMC ports.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 236 IPMC Ports Configuration field descriptions

Field	Description
Index	The index of the IPMC static routing table.
Destination IP	Sets the destination IPMC address for this route.
VLAN	Sets the VLAN ID for this IPMC route.
Host Ports	Sets the ports as host ports for this IPMC route.
Primary Ports	Sets the ports as primary ports for this IPMC route.
Backup Ports	Sets the ports as backup ports for this IPMC route.
Virtual Router	Sets the virtual router ID for this IPMC route.
Delete	Clears Host Ports or Primary Ports or Backup Ports from this IPMC route.

IPMC Trunks Configuration

Device Console > Configure > Layer 3 > Routes > *IPMC Trunks*

Use the **IPMC Trunks** tab to configure IPMC trunks.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 237 IPMC Trunks Configuration field descriptions

Field	Description
Index	The index of the IPMC static routing table.
Destination IP	Sets the destination IPMC address for this route.
VLAN	Sets the VLAN ID for this IPMC route.
Host Trunk	Sets the trunk as host trunk for this IPMC route.
Primary Trunk	Sets the trunk as primary trunk for this IPMC route.
Backup Trunk	Sets the trunk as backup trunk for this IPMC route.
Virtual Router	Sets the virtual router ID for this IPMC route.
Host Ports	Shows the ports of host trunks configured for this IPMC route.
Primary Ports	Shows the ports of primary trunks configured for this IPMC route.
Backup Ports	Shows the ports of backup trunks configured for this IPMC route.
Delete	Clears Host Trunk(s) or Primary Trunk(s) or Backup Trunk(s) from this IPMC route.

IPMC Adminkeys Configuration

Device Console > Configure > Layer 3 > Routes > *IPMC Adminkeys*

Use the **IPMC Adminkeys** tab to configure IPMC *admin keys*.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 238 IPMC Adminkeys Configuration field descriptions

Field	Description
Index	The index of the IPMC static routing table.
Destination IP	Sets the destination IPMC address for this route.
VLAN	Sets the VLAN ID for this IPMC route.
Host Adminkey	Sets the adminkey as host adminkey for this IPMC route.
Primary Adminkey	Sets the adminkey as primary adminkey for this IPMC route.
Backup Adminkey	Sets the adminkey as backup adminkey for this IPMC route.
Virtual Router	Sets the virtual router ID for this IPMC route.
Host Ports	Shows the ports of host adminkeys configured for this IPMC route.
Primary Ports	Shows the ports of primary adminkeys configured for this IPMC route.
Backup Ports	Shows the ports of backup adminkeys configured for this IPMC route.
Delete	Clears Host Adminkey(s) or Primary Adminkey(s) or Backup Adminkey(s) from this IPMC route.

Configuring RMAPs

The following sections describe the tasks associated with RMAP configuration:

General Configuration

Device Console > Configure > Layer 3 > RMAP > *General*

Use the **General** tab to configure RMAP parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 239 RMAP General Configuration field descriptions

Field	Description
RMAP	The route map index.
Local Preference	Sets the local preference of the matched route.
AS-Path	Sets AS-Path Prepend of the matched route.
Precedence	Sets the precedence of the route map.
Metric Type	Sets metric-type of the matched route: none, type 1, or type 2
Metric	Sets the metric of the route map.
Weight	Sets the weight of the route map.
State	Enables or disables the route map.

Access List Configuration

Device Console > Configure > Layer 3 > RMAP > *Access List*

Use the **Access List** tab to configure RMAP Access List.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 240 RMAP Access List Configuration field descriptions

Field	Description
RMAP	The route map index.
Access List	Sets the IP access list.
Network Filter	Sets the network filter for the route map access list.
Metric	Sets the metric for the route map access list.
Action	Sets the action for the route map access list: permit or deny
State	Enables or disables the route map access list.

AS-Path Access List Configuration

Device Console > Configure > Layer 3 > RMAP > *AS-Path Access List*

Use the **AS-Path Access List** tab to configure RMAP Autonomous System path Access List.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 241 RMAP AS-Path Access List Configuration field descriptions

Field	Description
RMAP	The route map index.
AS-path Index	Sets the Autonomous System (AS) path index.
AS Number	Sets AS filter's path number.
Action	Sets the AS filter action: permit or deny
State	Enables or disables the AS filter.

Configuring RIP

The following sections describe the tasks associated with RIP configuration:

General Configuration

Device Console > Configure > Layer 3 > RIP > *General*

Use the **General** tab to configure RIP state and update period

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 242 RIP General Configuration field descriptions

Field	Description
Global RIP State	Enables or disables RIP.
Update Period	Sets the time interval for sending for RIP table updates, in seconds.

RIP Interface Configuration

Device Console > Configure > Layer 3 > RIP > *RIP Interface*

Use the **RIP Interface** tab to configure RIP interfaces.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 243 RIP Interface Configuration field descriptions

Field	Description
Index	RIP Interface Index.
Version	Sets the RIP version used by this interface: v1, v2, both
Supplying Route Updates	Enables or disables supplying route updates to other routers.
Listening to Route Updates	Enables or disables listening to route updates from other routers.
Triggered Updates	Enables or disables Triggered Updates, which are used to speed convergence.
Multicast Updates	Enables or disables multicast updates of the routing table.
Poisoned Reverse	Enables or disables the poisoned reverse. When disabled, the switch uses only split horizon.
RIP Protocol	Enables or disables RIP protocol.
Route Metric	Sets the RIP route metric for this interface.
Authentication Type	Sets the authentication type used on this interface: none, password
Authentication Key	Sets the authentication key password.
Default Route action	Sets the default route action: both, supply, listen, none
Split Horizon	Enables or disables split horizon.

Static Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > *Static Route Redistribute*

Use the **Static Route Distribute** tab to configure RIP static route redistribution parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 244 RIP Static Route Redistribute Configuration field descriptions

Field	Description
Metric	Specify the metric to be assigned to RIP Static Route. A value of 0 indicates none.
Route Maps	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window.

BGP External Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > *BGP External Route Redistribute*

Use the **BGP External Route Distribute** tab to configure RIP External BGP redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 245 RIP – BGP External Route Redistribute Configuration field descriptions

Field	Description
Metric	Specify the metric to be assigned to the RIP External BGP Route. A value of 0 indicates none.
Route Maps	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window.

BGP Internal Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > *BGP Internal Route Redistribute*

Use the **BGP Internal Route Distribute** tab to configure RIP Internal BGP redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 246 RIP – BGP Internal Route Redistribute Configuration field descriptions

Field	Description
Metric	Specify the metric to be assigned to the RIP Internal BGP Route. A value of 0 indicates none.
Route Maps	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window.

Fixed Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > *Fixed Route Redistribute*

Use the **Fixed Route Distribute** tab to configure RIP Fixed Route redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 247 RIP – Fixed Route Redistribute Configuration field descriptions

Field	Description
Metric	Specify the metric to be assigned to the RIP Fixed Route. A value of 0 indicates none.
Route Maps	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window.

OSPF Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > *OSPF Route Redistribute*

Use the **Fixed Route Distribute** tab to configure RIP OSPF routes redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 248 RIP – OSPF Route Redistribute Configuration field descriptions

Field	Description
Metric	Specify the metric to be assigned to the RIP OSPF Route. A value of 0 indicates none.
Route Maps	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window.

OSPF External Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > *OSPF External Route Redistribute*

Use the **Fixed Route Distribute** tab to configure RIP OSPF external routes redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 249 RIP – OSPF External Route Redistribute Configuration field descriptions

Field	Description
Metric	Specify the metric to be assigned to the RIP OSPF External Route. A value of 0 indicates none.
Route Maps	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window.

Configuring OSPF

The following sections describe the configuration tasks associated with Open Shortest Path First (OSPF) Routing protocol:

OSPF General Configuration

Device Console > Configure > Layer 3 > OSPF > *General*

Use the General tab to configure OSPF administrative settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **General** tab.

Table 250 OSPF General field descriptions

Field	Description
Route Metric	Sets the metric used for OSPF Configuration. A value of 0 indicates none.
Route Metric Type	Sets the metric type used for OSPF Configuration to none, type 1, or type 2.
State	Enables or disables OSPF. The value enabled denotes that the OSPF Process is active on at least one interface; disabled disables it on all interfaces.
LSBD	Sets the LSDB limit for external LSA.

OSPF Area Configuration

Device Console > Configure > Layer 3 > OSPF > *Areas*

Use the Area tab to configure OSPF Area settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Areas** tab.

Table 251 OSPF Area field descriptions

Field	Description
Index	The OSPF area number for which the OSPF area table is related.
ID	The OSPF area ID. This is a 32-bit integer that uniquely identifies an area. Area ID 0.0.0.0 is used for the OSPF backbone. If you are attempting to delete the OSPF backbone area, make sure there are no configured Virtual Interfaces.
Type	Defines the type of area. For example, when a virtual link has to be established with the backbone, the area type must be defined as transit. • **Transit area**: This area type allows area summary information to be exchanged between routing devices. Any area that is not a stub area or NSSA is considered to be transit area. • **Stub area**: An OSPF area where external routing information is not distributed. Typically, a stub area is connected to only one other area. • **NSSA**: Not-So-Stubby Area (NSSA) is similar to stub area, with additional capabilities. For example, routes originating from within the NSSA can be propagated to adjacent transit and backbone areas. External routes from outside the Autonomous System (AS) can be advertised within the NSSA, but are not distributed into other areas.
Metric	The metric value applied at the indicated type of service. This metric is the metric that is applied to the default route when it is advertised in a Stub/NSSA area.
Authentication Type	Type of authentication being used, as follows: • **None**: No authentication required. • **Password**: Authenticates simple passwords so that only trusted routing devices can participate. • **MD5**: MD5 cryptographic authentication is required.
SPF Interval	The OSPF interval, which is the time interval between two successive SPF calculations of the shortest path tree using the Dijkstra's algorithm.
Status	This variable displays the status of the entry. Currently it is always in active state.

OSPF Interface Configuration

Device Console > Configure > Layer 3 > OSPF > *Interfaces*

Use the Interfaces tab to configure OSPF Interfaces settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Interfaces** tab.

Table 252 OSPF Interfaces field descriptions

Field	Description
Index	The OSPF area index
Area	Configures the area number this OSPF interface.
Priority	The priority of this interface. Used in multi-access networks, this field is used in the designated router election algorithm. The value of 0 (zero) signifies that the router is not eligible to become the designated router on this particular network. In the event of a tie in this value, routers use their Router ID as a tie breaker.
Cost	Configures cost set for the selected path--preferred or backup. Usually the cost is inversely proportional to the bandwidth of the interface. Low cost indicates high bandwidth.
Hello Interval	Configures the interval in seconds or milliseconds (depending on Hello Interval Unit) between the Hello packets for the interfaces.
Hello Interval Unit	Sets the unit of measurement (seconds or milliseconds) for Hello Interval.
Router Dead Interval	The number of seconds or milliseconds (depending on Dead Interval Unit) that a router's hello packets have not been seen before its neighbors declare the router down. This should be some multiple of the hello interval. This value must be the same for all routers attached to a common network.
Router Dead Interval Unit	Sets the unit of measurement (seconds or milliseconds) for Router Dead Interval.
Transit Delay/ Transmission Delay	The estimated number of seconds it takes to transmit a link state update packet over this interface.
Retransmit Interval/ Retransmission Interval	The number of seconds between link-state advertisement retransmissions, for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets.

Table 252 OSPF Interfaces field descriptions

Field	Description
Authentication Key	The Authentication Key. If the Area's Authorization Type is a simple password, and the key length is shorter than 8 octets, the agent left adjusts and zero fills to 8 octets. Note that unauthenticated interfaces need no authentication key, and simple password authentication cannot use a key of more than 8 octets. Larger keys are useful only with authentication mechanisms not specified in this document. When read, the Authentication key always returns an Octet String of length zero.
MD5 Key	MD5 authentication key string.
Passive	Enables or disables Passive mode.
Point-to-Point Interface	Enables or disables point-to-point interface.
Status	Enables or disables the status of the entry.

OSPF Summary Range Configuration

Device Console > Configure > Layer 3 > OSPF > *Summary Ranges*

Use the Summary Ranges tab to configure OSPF Summary Range settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Summary Ranges** tab.

Table 253 OSPF Summary Ranges field descriptions

Field	Description
Index	The current OSPF summary range.
Address	The base IP address for the range.
Mask	The IP address mask for the range.
Area Index	The area index used by the switch.
Hide State	Allows the OSPF summary range to be hidden or visible.
State	Enables or disables the OSPF summary range.

OSPF Virtual Interface Configuration

Device Console > Configure > Layer 3 > OSPF > *Virtual Interfaces*

Use the Virtual Interfaces tab to configure OSPF Virtual Interfaces settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Virtual Interfaces** tab.

Table 254 OSPF Virtual Interfaces field descriptions

Field	Description
Index	The Virtual Interface index.
Area Index	The OSPF area index
Hello Interval	Configures the interval in seconds or milliseconds (depending on Hello Interval Unit) between the hello packets for the interfaces.
Hello Interval Unit	Sets the unit of measurement (seconds or milliseconds) for Hello Interval.
Router Dead Interval	The number of seconds or milliseconds (depending on Dead Interval Unit) that a router's hello packets have not been seen before its neighbors declare the router down. This should be some multiple of the hello interval. This value must be the same for all routers attached to a common network.
Router Dead Interval Unit	Sets the unit of measurement (seconds or milliseconds) for Router Dead Interval.
Transit Delay/ Transmission Delay	The estimated number of seconds it takes to transmit a link-state update packet over this interface.
Retransmit Interval/ Retransmission Interval	The number of seconds between link-state advertisement retransmissions, for adjacencies that belong to this interface. This value is also used when retransmitting database description and link-state request packets. This value should be well over the expected round-trip time.
Neighbor	The Router ID of the Virtual Neighbor.
Authentication Key	The authentication key. If the Authorization Type is a simple password, the device left-adjusts and zero-fills to 8 octets. Simple password authentication cannot use a key of more than 8 octets. **Note**: Unauthenticated interfaces do not require an authentication key.
MD5 Key	MD5 key authentication string.
Status	Enables or disables the status of the entry.

OSPF Host Table Configuration

Device Console > Configure > Layer 3 > OSPF > *Host Table*

Use the Host Table tab to configure OSPF Host Table settings.

Note: You must enable the OSPF Administrative Status (State) for performing this configuration.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Host Table** tab.

Table 255 OSPF Host Table field descriptions

Field	Description
Index	Enter a host entry number. Host routes are used for advertising network device IP addresses to external networks within OSPF.
Host Address	The IP Address of the OSPF host.
Area Number	The OSPF area index number.
Cost	The metric to be advertised.
State	Enables or disables the status of the entry.

OSPF Static Route Redistribution Configuration

Device Console > Configure > Layer 3 > OSPF > *Static Route Redistribute*

Use the Static Route Redistribute tab to configure OSPF Static Route Redistribution settings.

Note: You must enable the OSPF Administrative Status (State) for performing this configuration.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Static Route Redistribute** tab.

Table 256 OSPF Static Route Redistribute field descriptions

Field	Description
Metric	Sets the metric to be assigned to redistributed static routes. A value of 0 indicates none.
Metric Type	Sets the metric type of the redistributed static route as none, type1, or type2.
RMAP	Click the **Browse…** button to open a Browser window. You can select pre-defined route maps in this window.

OSPF Fixed Route Redistribution Configuration

Device Console > Configure > Layer 3 > OSPF > *Fixed Route Redistribute*

Use the Fixed Route Redistribute tab to configure OSPF Fixed Route Redistribution settings.

Note: You must enable the OSPF Administrative Status (State) for performing this configuration.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Fixed Route Redistribute** tab.

Table 257 OSPF Fixed Route Redistribute field descriptions

Field	Description
Metric	The export metric for redistributed fixed routes. A value of 0 indicates none.
Metric Type	Specify the metric type of the redistributed fixed route as none, type1, or type2.
RMAP	Click the **Browse…** button to open a Browser window. You can select pre-defined route maps in this window.

OSPF RIP Route Redistribution Configuration

Device Console > Configure > Layer 3 > OSPF > *RIP Route Redistribute*

Use the RIP Route Redistribute tab to redistribute Routing Information Protocol (RIP) settings into OSPF.

Note: You must enable the OSPF Administrative Status (State) for performing this configuration.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **RIP** tab.

Table 258 OSPF RIP Route Redistribute field descriptions

Field	Description
Metric	Specify the metric to be assigned for redistributed RIP routes. A value of 0 indicates none.
Metric Type	Specify the metric type of the redistributed RIP route to none, type1, or type2.
RMAP	Click the **Browse…** button to open a Browser window. You can select pre-defined route maps in this window.

OSPF MD5 Key Configuration

Device Console > Configure > Layer 3 > OSPF > *MD5 Key*

Use this tab to configure OSPF MD5 keys.

Table 259 OSPF MD5 Key field descriptions

Field	Description
Index	Key index number
Key	Sets the MD5 key for OSPF packets.

OSPF Loopback Interface Configuration

Device Console > Configure > Layer 3 > OSPF > *Loopback Interface*

Use this tab to configure an OSPF loopback interface.

Table 260 OSPF Loopback Interface field descriptions

Field	Description
Index	Sets the index number of the loopback interface.
Area	Sets the area number for the interface.
Status	Enables or disables the OSPF loopback interface.

OSPF BGP External Route Redistribute Configuration

Device Console > Configure > Layer 3 > OSPF > *BGP External Route Redistribute*

Use the BGP External Routes Redistribute tab to redistributed eBGP routes into OSPF.

Table 261 OSPF BGP External Route Redistribute field descriptions

Field	Description
Metric	Sets the metric to be assigned to redistributed BGP external routes . A value of 0 indicates none.
Metric Type	Sets the metric type of redistributed BGP external routes to none, type1, or type2.
RMAP	Click **Browse...** to open a browser window. You can select pre-defined route maps in this window.

OSPF BGP Internal Route Redistribute Configuration

Device Console > Configure > Layer 3 > OSPF > *BGP Internal Route Redistribute*

Use the BGP Internal Routes Redistribute tab to redistributed iBGP routes into OSPF.

Table 262 OSPF BGP Internal Route Redistribute field descriptions

Field	Description
Metric	Sets the metric to be assigned to redistributed BGP internal routes . A value of 0 indicates none.
Metric Type	Sets the metric type of the redistributed BGP internal routes to none, type1, or type2.
RMAP	Click **Browse...** to open a browser window. You can select pre-defined route maps in this window.

Configuring BGP

The following sections describe the tasks associated with BGP configuration:

General Configuration

Device Console > Configure > Layer 3 > BGP > *General*

Use the **General** tab to configure BGP parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 263 BGP General Configuration field descriptions

Field	Description
State	Enables or disables BGP state.
Local Preference	Sets the local preference value. The path with the higher value is preferred.
Autonomous System Number	Sets the autonomous system (AS) number.
Max External BGP Paths	Sets the maximum external BGP paths.
Max Internal BGP Paths	Sets the maximum internal BGP paths.
ASN4 to ASN2 Compatibility	Enables or disables ASN4 to ASN2 compatibility.
DSCP Marking	Sets the BGP DSCP marking value.

Peer Configuration

Device Console > Configure > Layer 3 > BGP > *Peer General*

Use the **Peer General** tab to configure BGP peer parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 264 BGP Peer Configuration field descriptions

Field	Description
Index	BGP Peer index.
Remote Address	Sets the remote IP address for the specified peer.
Remote Autonomous System	Sets the remote autonomous system number for the specified peer.
Local Interface	Sets the Local IP interface.
Local Loopback Interface	Sets the Local IP loopback interface.
Hold Time	Sets the Hold Time.
Keep Alive Time	Sets the keep-alive time for the specified peer in seconds.
Advertisements Time	Sets the minimum time between Advertisements.
Time to Live	Sets the time-to-live value for the specified peer.
Next Hop Self	Enables or disables using this router as next-hop in BGP updates.
Connect Retry Interval	Sets the connection retry interval, in seconds.
Route Originations Time	Sets the minimum time between route originations.
Peer State	Enables or disables the peer.
Password	Sets the peer BGP password.
Passive State	Enables or disables BGP passive peer.
TTL Security Hops	Sets BGP TTL Security Hops.
In-Route Map	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window to add them to the in-route map list.
Out-Route Map	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window to add them to the out-route map list.

Peer Redistribution Configuration

Device Console > Configure > Layer 3 > BGP > Peer Redistribution

Use the **Peer Redistribution** tab to configure BGP redistribution parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 265 BGP Peer Redistribution Configuration field descriptions

Field	Description
Index	BGP Peer index.
Route Metric	Sets the default metric of advertised routes.
Default Route Action	Sets the default route action: none, import, originate or redistribute.
RIP State	Enables or disables advertising RIP routes.
OSPF State	Enables or disables advertising OSPF routes.
Fixed State	Enables or disables advertising fixed routes.
Static State	Enables or disables advertising static routes.

Aggregation Configuration

Device Console > Configure > Layer 3 > BGP > *Aggregation*

Use the **Aggregation** tab to configure BGP aggregation.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 266 BGP Aggregation Configuration field descriptions

Field	Description
Index	Aggregation index
Address	Sets the starting subnet IP address for the aggregation.
Mask	Sets the subnet mask for the aggregation.
State	Enables or disables the aggregation.

Group Configuration

Device Console > Configure > Layer 3 > BGP > *Group*

Use the **Group** tab to configure BGP Groups.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 267 BGP Group Configuration field descriptions

Field	Description
Index	BGP Group index.
Name	Sets the group name.
Remote Address	Sets the remote IP address for the specified group.
Remote Mask	Sets the remote network mask for the specified group.
Local Interface	Sets the Local IP interface.
Local Loopback Interface	Sets the Local IP loopback interface.
Limit	Sets the maximum number of BGP dynamic peers.
Hold Time	Sets the Hold Time.
Keep Alive Time	Sets the keep-alive time for the specified peer in seconds.
Advertisements Time	Sets the minimum time between Advertisements.
Time to Live	Sets the time-to-live value for the specified peer.
Next Hop Self	Enables or disables using this router as next-hop in BGP updates.
Route Originations Time	Sets the minimum time between route originations.
Peer State	Enables or disables the peer.
TTL Security Hops	Sets BGP TTL Security Hops.
Password	Sets the peer BGP password.
In-Route Map	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window to add them to the in-route map list.
Out-Route Map	Click **Browse...** to open a Browser window. You can select pre-defined route maps in this window to add them to the out-route map list.

Group Redistribution Configuration

Device Console > Configure > Layer 3 > BGP > *Group Redistribution*

Use the **Group Redistribution** tab to configure BGP Group Redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 268 BGP Group Redistribution Configuration field descriptions

Field	Description
Index	BGP Group index.
Route Metric	Sets the default metric of advertised routes.
Default Route Action	Sets the default route action: none, import, originate or redistribute.
RIP State	Enables or disables advertising RIP routes.
OSPF State	Enables or disables advertising OSPF routes.
Fixed State	Enables or disables advertising fixed routes.
Static State	Enables or disables advertising static routes.

Configuring IGMP

The following sections describe the tasks associated with IGMP configuration:

General Configuration

Device Console > Configure > Layer 3 > IGMP > *General*

Use the **General** tab to configure IGMP parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 269 IGMP General Configuration field descriptions

Field	Description
State	Enables or disables IGMP state.
Filter State	Enables or disables Filter state.
Querier State	Enables or disables Querier state.

Snooping Configuration

Device Console > Configure > Layer 3 > IGMP > *Snooping*

Use the **Snooping** tab to configure IGMP Snooping.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 270 IGMP Snooping Configuration field descriptions

Field	Description
State	Enables or disables IGMP Snooping state.
Multicast Router Timeout	Sets the timeout value, in seconds, for IGMP Membership queries.
Timeout	Sets the query response interval.
Query Interval	Sets the query interval.
Robustness	Sets the IGMP robustness.
Unregistered IPMC	Enables or disables unregistered IPMC flooding.
Router Alert	Enables or disables sending IGMP router alert messages.
Report Aggregation	Enables or disables IGMP Membership Report aggregation.
Source IP	Sets the IGMP snooping source IP address for the selected VLAN.
Snooping VLANs	Click **Browse...** to open a Browser window. You can select the VLANs in this window to add them to IGMP Snooping.
Fast Leave VLANs	List of configured FastLeave VLANs.

IGMPv3 Snooping Configuration

Device Console > Configure > Layer 3 > IGMP > *V3 Snooping*

Use the **V3 Snooping** tab to configure IGMPv3 Snooping.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 271 IGMPv3 Snooping Configuration field descriptions

Field	Description
State	Enables or disables IGMPv3 Snooping.
Sources	Sets the maximum number of IGMP multicast sources to snoop from within the group record.
Exclude Filter-mode Reports	Enables or disables snooping on IGMPv3 Exclude Reports. When disabled, the switch ignores Exclude Reports.
V1/V2 Report Snooping	Enables or disables snooping on IGMP version 1 and version 2 reports. When disabled, the switch drops IGMPv1 and IGMPv2 reports.

Static Multicast Router Configuration

Device Console > Configure > Layer 3 > IGMP > *Static Multicast Router*

Use the **Static Multicast Router** tab for IGMP static multicast router configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 272 IGMP Static Multicast Router Configuration field descriptions

Field	Description
Port	Sets the port number of the Static Multicast Router entry.
VLAN	Sets the VLAN number of the Static Multicast Router.
Version	Sets the IGMP version of the Static Multicast Router: version1, version2, version3.

Relay Configuration

Device Console > Configure > Layer 3 > IGMP > *Relay*

Use the **Relay** tab for IGMP relay configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 273 IGMP Relay Configuration field descriptions

Field	Description
State	Enables or disables IGMP Relay.
VLANs	Click **Browse...** to open a Browser window. You can select the VLANs in this window to add them to IGMP Relay.
Report Interval	Sets the unsolicited reports interval in seconds.

Relay Multicast Router Configuration

Device Console > Configure > Layer 3 > IGMP > *Relay Multicast Router*

Use the **Relay Multicast Router** tab for IGMP relay multicast router configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 274 IGMP Relay Multicast Router Configuration field descriptions

Field	Description
Index	IGMP Relay Multicast Router index.
Address	Sets the IP address of the IGMP multicast router used for IGMP Relay.
State	Enables or disables the multicast router.
Interval	Sets the time interval, in seconds, between ping attempts to the upstream multicast routers.
Failed Attempts	Sets the number of failed ping attempts required before the switch declares this multicast router as DOWN.
Successful Attempts	Sets the number of successful ping attempts required before the switch declares this multicast router as UP.
Version	Sets the IGMP Version: igmpv1 or igmpv2

Filter Configuration

Device Console > Configure > Layer 3 > IGMP > *Filter*

Use the **Filter** tab for IGMP filter configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 275 IGMP Filter Configuration field descriptions

Field	Description
Index	IGMP Filter index.
Multicast Address1	Sets the IP Multicast Address 1 for the filter.
Multicast Address2	Sets the IP Multicast Address 2 for the filter.
Action	Allows or denies multicast traffic for the specified IP multicast addresses.
State	Enables or disables IGMP filter.

Filter Ports Configuration

Device Console > Configure > Layer 3 > IGMP > *Filter Ports*

Use the **Filter Ports** tab for IGMP filter ports configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 276 IGMP Filter Ports Configuration field descriptions

Field	Description
Port	The port index.
State	Enables or disables IGMP filtering on a port.
Filter	Adds an IGMP filter to this port.

Advanced Configuration

Device Console > Configure > Layer 3 > IGMP > *Advanced*

Use the **Advanced** tab for IGMP advanced configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 277 IGMP Advanced Configuration field descriptions

Field	Description
Query Interval	Sets the interval for IGMP Query Reports, in seconds.
Expected Packet Loss on Subnet	Sets the value of expected packet loss on the subnet.
Timeout	Sets the timeout value for IGMP Membership Reports, in seconds.
Fast leave VLANs	Click **Browse...** to open a Browser window. You can select the VLANs in this window to add them to Fast Leave VLANs list.
Router Alert	Enables or disables the Router Alert option in IGMP messages.
Flood State	Enables or disables the status of the flood unregistered.
Unregistered IPMC to CPU	Enables or disables unregistered IPMC to CPU.

Querier Configuration

Device Console > Configure > Layer 3 > IGMP > *Querier*

Use the **Querier** tab for IGMP Querier configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 278 IGMP Querier Configuration field descriptions

Field	Description
VLAN	The VLAN index.
Source IP	Sets the source IP address used as a proxy for IGMP Group Specific Queries.
Election Type	Sets the IGMP Querier election criteria as IPv4 address or MAC address.
Interval	Sets the interval between IGMP Query broadcasts, in seconds.
Max Response Time	Sets the maximum query response interval, in seconds.
Robustness	Sets the IGMP Robustness variable, which is number of times that the switch sends each IGMP message.
Startup Interval	Sets the Startup Query Interval, in seconds, which is the interval between general queries sent out during startup.
Startup Count	Sets the Startup Query Count, which is the number of IGMP queries sent out during startup. Each query is separated by the Startup Query Interval.
Version	Sets the IGMP Version of the VLAN: igmpv1, igmpv2, igmpv3
State	Enables or disables Querier on the selected VLAN.

Configuring DNS

The following sections describe the tasks associated with DNS configuration:

DNS Server Configuration

Device Console > Configure > Layer 3 > DNS > *DNS Server*

Use the **DNS Server** tab to configure DNS Server.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 279 DNS Server Configuration field descriptions

Field	Description
Primary Server IP Address	Sets the IP address of primary DNS server.
Primary Port	Sets the port of primary DNS server: data, mgt, or extm
Secondary Server IP Address	Sets the IP address of secondary DNS server.
Secondary Port	Sets the port of secondary DNS server: data, mgt, or extm
Domain Name	Sets the default domain name used by the switch.
IP Version	Sets the IP version: currently fixed at IPv4.

Configuring Bootp-Relay

The following sections describe the tasks associated with Bootp-Relay configuration:

General Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > *General*

Use the **General** tab to configure Bootp-Relay state.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 280 Bootp-Relay General Configuration field descriptions

Field	Description
State	Enables or disables Bootp-Relay

Server Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > Server

Use the **Server** tab to configure Bootp-Relay Server.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 281 Bootp-Relay Server Configuration field descriptions

Field	Description
Index	The server index.
Address	Sets the Bootp-Relay server address.

Broadcast Domain Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > *Broadcast Domain*

Use the **Broadcast Domain** tab to configure Bootp-Relay broadcast domain.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 282 Bootp-Relay Broadcast Domain Configuration field descriptions

Field	Description
Index	Broadcast domain index.
VLAN	Sets the VLAN of the broadcast domain. Each broadcast domain must have a unique VLAN.
State	Enables or disables the broadcast domain.

Broadcast Domain Server Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > *Broadcast Domain Server*

Use the **Broadcast Domain Server** tab to configure Bootp-Relay broadcast domain server.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 283 Bootp-Relay Broadcast Domain Server Configuration field descriptions

Field	Description
Index	Broadcast domain index.
Server	Broadcast domain server index.
Address	Sets the broadcast domain server address.

Option82 Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > *Option82*

Use the **Option82** tab for Bootp-Relay option82 configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 284 Bootp-Relay Option82 Configuration field descriptions

Field	Description
State	Enables or disables the Bootp-Relay option 82.
Policy	Sets the policy of Bootp-Relay option 82: replace, drop, or keep

Configuring Flooding

The following sections describe the flooding configuration tasks you can perform:

VLAN Flooding Configuration

Device Console > Configure > Layer 3 > Flooding > *VLAN Flooding*

Use this tab to configure VLAN flooding.

Table 285 VLAN Flooding field descriptions

Field	Description
VLAN	Sets the VLAN ID.
Flood unregistered IPMC	Enables or disables flooding unregistered IPMCs.
Send unregistered IPMC to CPU	Enables or disables flooding unregistered IPMCs to CPU.
Optimized Flooding	Enables or disables Optimized flooding.

Configuring VRRP

The following sections describe the configuration tasks associated with Virtual Router Redundancy Protocol (VRRP) protocol:

VRRP General Configuration

Device Console > Configure > Layer 3 > VRRP > *General*

Use the General tab to configure general VRRP settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **General** tab.

Table 286 VRRP General field descriptions

Field	Description
VRRP Operation State	Globally enables or disables VRRP operation.
Virtual Router Tracking	Sets the increment of VRRP virtual router priority. This priority is adjusted by tracking the state of other virtual routers. The value 254 provides maximum priority.
IP Interface Tracking	Sets the increment of VRRP virtual router priority. This priority is adjusted by tracking the number of active (up) IP interfaces on the switch.
VLAN Switch Port Tracking	Sets the increment of VRRP virtual router priority. The priority is adjusted by tracking the port state of those ports that belong to the same virtual LAN as the virtual router.
Hot Standby	Enables or disables hot-standby processing, in which two or more switches provide redundancy for each other.
Hold Off	Sets the Hold Off value.

VRRP Virtual Router Configuration

Device Console > Configure > Layer 3 > VRRP > *Virtual Router*

Use the Virtual Router tab to configure VRRP Virtual Router settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Virtual Router** tab.

Table 287 VRRP Virtual Router field descriptions

Field	Description
Index	The index number of the VRRP virtual router.
ID	Defines the virtual router ID. This is used in conjunction with addr (below) to define a virtual router on this switch. To create a pool of VRRP-enabled routing devices which can provide redundancy to each other, each participating VRRP device must be configured with the same virtual router: one that shares the same VRID and addr combination. The VRID for standard virtual routers (where the virtual router IP address is not the same as any virtual server) can be any integer as defined on your particular switch model.
IP Address	Defines the IP address for this virtual router using dotted decimal notation. This is used in conjunction with the VRID (above) to configure the same virtual router on each participating VRRP device.
IP Interface	Sets the IP interface that the VRRP virtual router represents. If the IP interface has the same IP address as the IP Address option above, this switch is considered the "owner" of the defined virtual router. An owner has a special priority of the highest available virtual router number, and always assumes the role of master router, even if it must pre-empt another virtual router which has assumed master routing authority. This pre-emption occurs even if the Pre-emption option below is disabled.
Virtual Router State	Enables or disables the virtual router.
Priority	Defines the election priority bias for this virtual server. During the master router election process, the routing device with the highest virtual router priority number wins. If there is a tie, the device with the highest IP interface address wins. If this virtual router's IP address (addr) is the same as the one used by the IP interface, the priority for this virtual router is automatically set to the highest available priority value.
Advertisement Interval	Sets the time interval between VRRP advertisements.

Table 287 VRRP Virtual Router field descriptions

Field	Description
Pre-emption	Enables or disables a higher priority Backup VRRP virtual router to pre-empt a low-priority Master. When enabled, if this virtual router is in backup mode but has a higher priority than the current master, this virtual router pre-empts the lower priority master and assumes control. Note that even when Pre-emption is disabled, this virtual router always pre-empts any other master if this switch is the owner. A switch is the owner when the IP interface address and virtual router address are the same.
Pre-emption Delay	Sets the delay for pre-emption.
Virtual Routes Tracking	Enables or disables tracking other virtual routers for priority adjustment.
IP Interfaces Tracking	Enables or disables tracking other router interfaces for priority adjustment.
VLAN Switch Ports Tracking	Enables or disables tracking the states of VLAN ports for priority adjustment.
Fast Advertisement	Enables or disables fast advertisement.

VRRP Virtual Interface Configuration

Device Console > Configure > Layer 3 > VRRP > *Virtual Interface*

Use the Virtual Interface tab to configure VRRP Virtual Interface settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Virtual Interface** tab.

Table 288 VRRP Virtual Interface field descriptions

Field	Description
Index	The VRRP interface number.
Authentication	Sets the type of authentication in use. • **none**: No authentication. • **password**: use the specified password for authentication.
Password	Sets the password for authentication.

VRRP Virtual Router Group Configuration

Device Console > Configure > Layer 3 > VRRP > *Virtual Router Group*

Use the Virtual Router Group tab to configure VRRP Virtual Router Group settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Virtual Router Group** tab.

Table 289 VRRP Virtual Router Group field descriptions

Field	Description
Index	The number of the VRRP virtual router. **Note**: The index value is always 1 and you can add only one entry in this table.
ID	The VRRP virtual group identifier.
IP Interface	Sets the IP Interface that the VRRP virtual group represents.
Virtual Router Group State	Enables or disables the VRRP virtual router group.
Priority	Sets the priority value to be used by the specified VRRP virtual routers.
Advertisement Interval	Sets the time interval (in seconds) between VRRP advertisements.
Pre-emption	Enables or disables a higher priority Backup VRRP virtual router to pre-empt a low priority Master.
Pre-emptive Delay Interval	Sets the pre-emptive delay interval, in seconds.
IP Interfaces Tracking	Enables or disables tracking other router interfaces for priority adjustment.
VLAN Switch Ports Tracking	Enables or disables tracking port state of VLAN ports for priority adjustment.
Fast Advertisements	Enables or disables fast advertisement.

Configuring ARP

The following sections describe ARP configuration tasks you can perform:

ARP Configuration

Device Console > Configure > Layer 3 > ARP > *ARP*

Use this tab to configure Address Resolution Protocol (ARP) parameters.

Table 290 ARP field descriptions

Field	Description
Cache Timeout	Sets the time after which the entry in cache is deleted.
Cache Pending Time	Sets the time for which an unresolved entry is held until a response is received.
Max Retries	Sets the maximum number of retry attempts.
Re-ARP Period	Sets the Re-ARP period in seconds.

Static ARP Configuration

Device Console > Configure > Layer 3 > ARP > *Static ARP*

Use the **Static ARP** tab to configure ARP parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 291 Static ARP Configuration field descriptions

Field	Description
Index	The static ARP index.
IP Address	Sets the IP address for the ARP entry.
MAC Address	Sets the MAC address for the ARP entry.
VLAN	Sets the VLAN for the ARP entry.
Port	Sets the Port for the ARP entry.

Configuring Ports

Switch Center lets you configure physical properties on a per-port basis.

This section covers the following topics:

Port Properties Configuration

Device Console > Configure > Ports > *Ports*

Use this feature to configure port properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **Ports** configuration tab.

Table 292 Ports field descriptions

Field	Description
Port	Port Index
Name	Port Name
State	Enables or disables the port.
VLAN Tag State	Sets the VLAN tagging of the port: tagged or untagged. You cannot add a port to more than one VLAN unless the port is tagged.
Default VLAN	Sets the default VLAN ID for the port. **Note:** To select another VLAN ID for this port, double-click the cell to display configured VLANs and select any of the VLANs that appear in the list. Then click **Modify**. The Default VLAN field displays the new selection.
PVID Tag State	Sets the PVID tag state: tagged or untagged.
PVID ingress Tag State	Sets the ingress PVID tag state of the port: tagged or untagged.
DSCP Remarking	Enables or disables DSCP re-marking on a port.
Gig Auto Negotiate	Sets the autonegotiation for Gigabit Ethernet connection: on or off.
Gigabit Ethernet Speed	The port speed for Fast Ethernet connection: 10Mbs, 100Mbs, 1000Mbs, or any.
Gigabit Mode	The port mode for Fast Ethernet connection: full-duplex, half-duplex, or full-or half-duplex.
Gig Flow Control	Sets the port flow control for Gigabit Ethernet connection: other, transmit, receive, both, or none.
FDB Learning	Enables or disables Layer 2 FDB learning on the port.
Flood Blocking	Enables or disables port Flood Blocking. When enabled, unicast and multicast packets with unknown destination MAC addresses are blocked from the port.

Table 292 Ports field descriptions

Field	Description
Fast Forwarding Mode	Disables or enables Port Fast Forwarding, which permits a port that participates in Spanning Tree to bypass the Listening and Learning states and enter directly into the Forwarding state. While in the Forwarding state, the port listens to the BPDUs to learn if there is a loop and, if dictated by normal STG behavior (following priorities, etc.), the port transitions into the Blocking state.
RMON	Enables or disables Remote Monitoring.
Link Trap	Enables or disables link trap.
Hold Off	Sets the hold off value.
Flow Control	Sets the port flow control for Gigabit Ethernet connection, as follows: `other, transmit, receive, both, or none`
BPDU Guard	Enables or disables BPDU Guard.
Flood Blocking	Enables or disables port flood blocking. When enabled, unicast and multicast packets with unknown destination MAC addresses are blocked from the port.
Error Disable	Enables or disables error disable recovery.
MAC Addr Notification	Enables or disables the MAC address notification syslog messages on the port.
EVB Profile	Sets the EVB profile.

Ports General Configuration

Device Console > Configure > Ports > *Ports General*

Use this tab to configure the general port properties.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 293 Ports General field descriptions

Field	Description
Port	Port number.
VLAN Tag State	Enables or disables VLAN tag state.
PVID Tag State	Enables or disables VLAN tag persistence. When disabled, the VLAN tag is removed from packets whose VLAN tag matches the port PVID even if the port is a tagged member of that VLAN.
FDB Learning	Enables or disables FDB learning on the port.
Flooding	Enables or disables flooding on the port.
MAC Notification	Enables or disables MAC notification syslog messages on the port.
Link Logging	Enables or disables syslog for interface state change.

Threshold Rate Configuration

Device Console > Configure > Ports > *Threshold Rate*

Use this tab to configure the port threshold rates.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 294 Threshold Rate field descriptions

Field	Description
Port	Port number.
Name	Port name.
State	Enables or disables the port.
Multicast Threshold	Enables or disables the port's multicast threshold. If disabled (`dis`), the port forwards all multicast packets.
Multicast Threshold Rate	Sets the number of multicast packets per second to the specified value.
Broadcast Threshold	Enables or disables the port's broadcast threshold. If disabled (`dis`), the port forwards all broadcast packets.
Broadcast Threshold Rate	Sets the number of broadcast packets per second to the specified value.
DLF Threshold	Enables or disables the port's unknown unicast threshold. If disabled (`dis`), the port forwards all unknown unicast packets.
DLF Threshold Rate	Sets the number of unknown unicast packets per second to the specified value.

Gigabit Link Configuration

Device Console > Configure > Ports > *Gigabit Link*

Use this tab to configure the port link parameters.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 295 Gigabit Link field descriptions

Field	Description
Port	Port number.
Name	Port name.
State	Enables or disables the port.
Auto-Negotiation	Sets the auto-negotiation for Gigabit Ethernet connection (on or off).
Speed	Sets the port speed for Fast Ethernet connection as follows: 10Mbs, 100Mbs, 1000Mbs, any
Mode	Sets the port mode for Fast Ethernet connection as follows: full-duplex, half-duplex, full-or half-duplex
Flow Control	Sets the port flow control for Gigabit Ethernet connection as follows: other, transmit, receive, both, none
Clause 73 Auto Negotiation	Enables or disables Clause 73 auto-negotiation.
Fast Link Down Detection	Enables or disables the non-IEEE Fast Link Down detection.

Unidirectional Link Detection (UDLD) Configuration

Device Console > Configure > Ports > *UDLD*

Use this tab to configure Unidirectional Link Detection (UDLD) for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 296 Port UDLD field descriptions

Field	Description
Port	Port number.
Name	Port name.
State	Enables or disables the port.
UDLD	Enables or disables UDLD.
Mode	Sets the UDLD mode for the port (normal or aggressive).

Operations, Administration and Management (OAM) Configuration

Device Console > Configure > Ports > *OAM*

Use this tab to configure Operations, Administration and Management (OAM) parameters for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 297 Port OAM field descriptions

Field	Description
Port	Port number.
Name	Port name.
State	Enables or disables the port.
OAM	Enables or disables OAM discovery process.
Mode	Sets the OAM mode for the port (active or passive).

ACL Configuration

Device Console > Configure > Ports > *ACL*

Use this tab to configure Access Control Lists (ACLs) for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 298 Port ACL field descriptions

Field	Description
Port	Port number.
ACL	Adds the specified ACL to the port.
ACL Group	Adds the specified ACL group to the port.

STP Configuration

Device Console > Configure > Ports > *STP*

Use this tab to configure Spanning Tree (STP) parameters for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 299 Port STP field descriptions

Field	Description
Port	Port number.
Name	Port name.
State	Enables or disables the port.
Port Edge	Enables or disables the port as an edge port.
Link Type	Sets the link type for the selected port.
Guard Type	Sets the Spanning Tree Guard type (`loop, root, none, default`).

Port Priority Configuration

Device Console > Configure > Ports > *Port Priority*

Use this tab to configure port priority.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 300 Port Priority field descriptions

Field	Description
Port	Port number.
Priority	Sets the priority for the selected port.

Unicast Bandwidth Configuration

Device Console > Configure > Ports > *Unicast Bandwidth*

Use this tab to configure Unicast Bandwidth for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 301 Unicast Bandwidth field descriptions

Field	Description
Port	Sets the index of the row in the port configurations table.
Name	Sets the switch port name.
Unicast Bandwidth	Sets the port unicast bandwidth.

Reflective Relay Configuration

Device Console > Configure > Ports > *Reflective Relay*

Use this tab to configure Reflective Relay for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 302 Reflective Relay field descriptions

Field	Description
Port	Sets the index of the row in the port configurations table.
Name	Sets the switch port name.
Reflective Relay	Enables or disables reflective relay for the port.

MAC Notification Configuration

Device Console > Configure > Ports > *Mac Notification*

Use this tab to configure MAC Notification for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 303 MAC Notification field descriptions

Field	Description
Port	Sets the index of the row in the port configurations table.
Name	Sets the switch port name.
Mac Notification	Enables or disables Mac notification for the port.

WRED/ECN General Configuration

Device Console > Configure > Ports > *WRED/ECN*

Use the **WRED/ECN** tab to set WRED and ECN states for ports.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 304 WRED/ECN Port - General Configuration field descriptions

Field	Description
Port	The port index.
WRED	Turns WRED for the selected port on or off.
ECN	Turns ECN for the selected port on or off.

WRED/ECN Profile Configuration

Device Console > Configure > Ports > *WRED/ECN Profiles*

Use the **WRED/ECN Profiles** tab to configure WRED and ECS profile parameters for ports

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 305 WRED/ECN Port - Profile Configuration field descriptions

Field	Description
Port	The port index.
Transmit Queue	The global transmit queue index.
TCP Min Threshold Rate	Sets the minimum threshold value of the global TCP profile for the port.
TCP Max Threshold Rate	Sets the maximum threshold value of the global TCP profile for the port.
TCP Drop Rate	Sets the drop rate value of the global TCP profile for the port.
Non TCP Min Threshold Rate	Sets the minimum threshold value of the global non TCP profile for the port.
Non TCP Max Threshold Rate	Sets the maximum threshold value of the global non TCP profile for the port.
Non TCP Drop Rate	Sets the drop rate value of the global non TCP profile for the port.
WRED State	Turns on or off WRED state of the global transmit queue for the port.

Configuring QoS – WRED/ECN

The following sections describe the tasks associated with QoS WRED/ECN configuration:

General Configuration

Device Console > Configure > QoS > WRED/ECN > General

Use the **General** tab to set WRED and ECS states globally.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 306 WRED/ECN General Configuration field descriptions

Field	Description
WRED	Turns global WRED state on or off.
ECN	Turns global ECN state on or off.

WRED/ECN Port Configuration

Device Console > Configure > QoS > WRED/ECN > Ports

Use the **Ports** tab to set WRED and ECS states for ports.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 307 WRED/ECN Port Configuration field descriptions

Field	Description
Port	The port index
WRED	Turns WRED state for the selected port on or off.
ECN	Turns ECN state for the selected port on or off.

WRED/ECN Port Profile Configuration

Device Console > Configure > QoS > WRED/ECN > Port Profiles

Use the **Port Profiles** tab to set WRED and ECS profile parameters for ports.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 308 WRED/ECN Port Profile Configuration field descriptions

Field	Description
Port	The port index
Transmit Queue	The global transmit queue index.
TCP Min Threshold Rate	Sets the minimum threshold value of the global TCP profile for the port.
TCP Max Threshold Rate	Sets the maximum threshold value of the global TCP profile for the port.
TCP Drop Rate	Sets the drop rate value of the global TCP profile for the port.
Non TCP Min Threshold Rate	Sets the minimum threshold value of the global non TCP profile for the port.
Non TCP Max Threshold Rate	Sets the maximum threshold value of the global non TCP profile for the port.
Non TCP Drop Rate	Sets the drop rate value of the global non TCP profile for the port.
WRED State	Turns on or off WRED state of the global transmit queue for the port.

Port Priority Configuration

Device Console > Configure > QoS > 802.1p > Port Priority

Use the **Port Priority** tab to configure Port Priority.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 309 Port Priority Configuration field descriptions

Field	Description
Port	Switch Port Number.
Priority	Switch Port Priority; a number between 0 and 7.

Priority CoS Configuration

Device Console > Configure > QoS > 802.1p > Priority CoS

Use the **Priority CoS** tab to configure Priority CoS.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 310 Priority CoS Configuration field descriptions

Field	Description
Priority	Frame Priority Number.
CoS	CoS for a Frame Priority; a number between 0 and 7.

CoS Weight Configuration

Device Console > Configure > QoS > 802.1p > CoS Weight

Use the **CoS Weight** tab to configure CoS Weight.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 311 CoS Weight Configuration field descriptions

Field	Description
CoS	CoS Number.
Weight	Weight of CoS

DSCP General Configuration

Device Console > Configure > QoS > DSCP > General

Use the **General** tab to set the DSCP state globally.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 312 DSCP General Configuration field descriptions

Field	Description
DSCP State	Turns global DSCP state on or off.

DSCP Configuration

Device Console > Configure > QoS > DSCP > DSCP Configuration

Use the **DSCP Configuration** tab to set DSCP Mapped/802.1p Priority.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 313 DSCP Configuration field descriptions

Field	Description
DSCP	DSCP value
New Mapped DSCP	Map DSCP Value
802.1p Priority	Map 802.1p value

Global Profile Configuration

Device Console > Configure > QoS > WRED/ECN > *Global Profile*

Use the **Global Profile** tab to configure WRED and ECS profile parameters

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 314 WRED/ECN Global Profile Configuration field descriptions

Field	Description
Transmit Queue	The global transmit queue index.
TCP Min Threshold Rate	Sets the minimum threshold value of the global TCP profile.
TCP Max Threshold Rate	Sets the maximum threshold value of the global TCP profile.
TCP Drop Rate	Sets the drop rate value of the global TCP profile.
Non TCP Min Threshold Rate	Sets the minimum threshold value of the global non TCP profile.
Non TCP Max Threshold Rate	Sets the maximum threshold value of the global non TCP profile.
Non TCP Drop Rate	Sets the drop rate value of the global non TCP profile.
WRED State	Turns on or off WRED state of the global transmit queue.

Configuring ACLs

This section covers the following ACL topics:

General ACL Properties Configuration

Device Console > Configure > Access Control List > *ACL*

Use this feature to configure the general ACL properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **ACL** configuration tab.

Table 315 ACL field descriptions

Field	Description
ACL	Configures the ACL number
Block	Displays the ACL Block number
Group	Displays the ACL Group number
Egress Ports	Displays the egress port, if applicable.
Statistics	Enables or disables statistics collection for this ACL.
Filter Action	Configures a filter action for packets that match the ACL definitions. You can choose to permit (pass) or deny (drop) packets, or set the Class of Service queue that handles the packets.
Priority	Configures the 802.1p priority (none, 0-7).
Out Prof DSCP Enable	Enables or disables out profile DSCP
CoSq	Configures the Class of Service queue. This section applies only if you set the filter action to setcos.
Mirror Port	Sets the port as the mirror target.
Log	Enables or disables logging for the selected ACL.
Tcp Flags	Sets the TCP flags.
Tcp Flags Mask	Sets the TCP flags mask.
User Priority	Sets user defined priority for the ACL.

Adding an ACL

To add an ACL, click **Insert** in the ACL Congiuration window. (**Device Console > Configure > Access Control List > ACL**).

The following table describes the fields of the Insert ACL window.

Table 316 Insert ACL field descriptions

Field	Description
ACL	Configures the ACL index number.
Egress Ports	Sets the Egress ports. Click **Browse** to select the ports.
Statistics	Enables or disables the ACL statistics.
Log	Enables or disables logging for the selected ACL.
Filter Action	Sets the filter action to `none, permit, deny or setprio` (set priority).
Priority	Sets the priority (`none, prio0-prio7`). Note that this field is enabled only when you set the Filter Action to `setprio`. The default setting is `none`.
Mirror Port	Sets the Mirror ports. Click **Browse** to select the ports.
Filter Action VLAN	Sets the VLAN to be changed. Note that this field is enabled only when you set the Filter Action to `changevlan`. Setting VLAN to 0 automatically disables `changevlan` for this VLAN.
Ethernet Format	Sets the Ethernet format (`none, Ethernet2, SNAP, LLC`).
Tag Format	Sets the Tag format (`disabled, any, none, tagged`).
IP Format	Sets the IP format (`none`, `ipv4`, `ipv6`).
Source MAC address	Sets the source MAC address.
Source MAC Mask	Sets the source MAC mask.
Destination MAC Address	Sets the destination MAC address.
Destination MAC Mask	Sets the destination MAC mask.
Ethernet Type	Sets the Ethernet type (`none, arp, ipv4, ipv6, mpls, rarp, any, other`).
Ethernet Value	Sets the Ethernet value. Note that this field is enabled only when you set the Ethernet type to `other`.
VLAN ID	Sets the VLAN Identifier.
VLAN Mask	Sets the VLAN mask.

Table 316 Insert ACL field descriptions

Field	Description
802.1p Priority	Sets 802.1p priority (none, 0-7).
Type Of Service	Sets the Type Of Service.
Protocol	Sets the protocol.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Source Port	Sets the source port.
Source Port Mask	Sets the source port mask.
Destination Port	Sets the destination port.
Destination Port Mask	Sets the destination port mask.
Tcp Flags	Sets the TCP flags.
Tcp Flags Mask	Sets the TCP flags mask.
Meter Action	Sets the meter action to unconfigured, outdrop or outpass.
Meter Status	Enables or disables port metering.
Committed Rate	Sets the committed rate.
Maximum Burst Size	Sets the maximum burst size.
In Prof User	Sets the in-profile user to 0-7.
In Prof Dscp	Sets the in-profile DSCP value to 0-63.
In Prof ToS	Enables or disables in-profile ToS.
Out Prof Dscp	Sets the out-profile DSCP value to 0-63.
In Profile User Enable	Enables or disables in-profile user.
In Profile Dscp Enable	Enables or disables in-profile DSCP.
Out Profile Dscp Enable	Enables or disables out-of-profile DSCP.

ACL Groups Configuration

Device Console > Configure > Access Control List > *ACL Groups*

Use this tab to compile one or more ACLs and ACL Blocks into an ACL Group. Once you create an ACL Group, you can assign the ACL Group to one or more ports.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **ACL Groups** configuration tab.

Table 317 ACL Groups field descriptions

Field	Description
ACL Group	Configures the ACL Group number.
ACLs	Add ACLs to the ACL Group, or remove ACLs from the ACL Group.
ACL Block	Add ACL Blocks to the ACL Group, or remove ACL Blocks from the ACL Group.

ACL Block Configuration

Device Console > Configure > Access Control List > *ACL Block*

Use the **ACL Block** tab for ACL Block configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 318 ACL Block Configuration field descriptions

Field	Description
ACL Block	Sets the ACL Block number.
ACLs	Adds or removes ACLs to or from the ACL Block.

Management ACL Configuration

Device Console > Configure > Access Control List > *Management ACL*

Use the **Management ACL** tab for Management ACL configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 319 Management ACL Configuration field descriptions

Field	Description
ACL	Sets the Management ACL number.
User Enable	Sets the user-specified update method for this ACL: disabled, enabled.
Statistics	Enables or disables the statistics collection for this ACL.
Filter Action	Sets a filter action for packets that match the ACL definitions. You can choose to permit (pass) or deny (drop) packets.
Protocol	Sets the protocol.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Source Port	Sets the source port.
Source Port Mask	Sets the source port mask.
Destination Port	Sets the destination port.
Destination Port Mask	Sets the destination port mask.

ACL Log Configuration

Device Console > Configure > Access Control List > *Log*

Use this tab to configure ACL logging.

Table 320 ACL Logging field descriptions

Field	Description
Interval	Sets filter log display interval.
Rate Limit	Sets filter log queue rate limit.

ACL VMAPs Configuration

Device Console > Configure > Access Control List > *VMAP*

Use this feature to add or remove a VLAN Map to ACLs.

Note: This tab is available only for VMready capable switches. Please disregard this information if it does not apply to your switch.

The following table describes the fields of the **VMAP** configuration tab.

Table 321 ACL VMAP field descriptions

Field	Description
Index	VMAP index
Egress Ports	Displays the egress ports.
Statistics	Enables or disables statistics collection for this ACL and VMAP.
Filter Action	Configures a filter action for packets that match the ACL VMAP definitions. You can choose to permit (pass) or deny (drop) packets, or set the Class of Service queue that handles the packets.

Adding VMAPs to an ACL

You can add VMAPs to ACL by clicking **Insert** in ACL VMAPs configuration window (**Device Console > Configure > Access Control List >** *VMAP*).

The following table describes the fields of the Insert VMAP window.

Table 322 Insert VMAP field descriptions

Field	Description
Index	The VMAP index.
Egress Ports	Sets the Egress ports. Use Browse button to select the ports.
Statistics	Enables or disables the statistics.
Filter Action	Sets the filter action (none, permit, deny, setprio).
Priority	Sets the priority (0-7, none). Note that this field is enabled only when you set the Filter Action to setprio. Or else, none is taken by default.
Filter Action VLAN	Sets the VLAN to be changed. Note that this field is enabled only when you set the Filter Action to `changevlan`. Setting VLAN to 0 automatically disables `changevlan` for this VLAN.
Ethernet Format	Sets the Ethernet format (none, ethernet2, snap, llc).
Tag Format	Sets the Tag format (disabled, any, none, tagged).
IP Format	Sets the IP format (none, ipv4, ipv6).
Source MAC Address	Sets the source MAC address.
Source MAC Mask	Sets the source MAC mask.
Destination MAC Address	Sets the destination MAC address.
Destination MAC Mask	Sets the destination MAC mask.
Ethernet Type	Sets the Ethernet type (none, arp, ipv4, ipv6, mpls, rarp, any, other)
Ethernet Value	Sets the Ethernet value. Note that this field is enabled only when you set the Ethernet type to “other”.
802.1p Priority	Sets 802.1p priority (0-7, none).
Type of Service	Sets the Type of Service value.
Protocol	Sets the protocol type.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.

Table 322 Insert VMAP field descriptions

Field	Description
Destination IP Mask	Sets the destination IP mask.
Source Port	Sets the source port.
Source Port Mask	Sets the source port mask.
Destination Port	Sets the destination port.
Destination Port Mask	Sets the destination port mask.
Port Metering Status	Enables or disables port metering.
Meter Action	Sets the meter action (unconfigured, outdrop, outpass).
Meter Status	Enables or disables meter status.
Committed Rate	Sets the committed rate.
Maximum Burst Size	Sets the maximum burst size.
In Prof User	Sets the in-profile user value.
In Prof Dscp	Sets the in-profile DSCP value.
In Prof ToS	Enables or disables in-profile ToS.
Out Prof Dscp	Sets the out-of-profile DSCP value.
In Prof User Enable	Sets the in-profile user (disabled, user defined state).
In Prof Dscp Enable	Sets the in-profile DSCP (disabled, user defined state).
Out Prof Dscp Enable	Enables or disables out-of-profile DSCP.
Mirror Port	Sets the port as the mirror target.
Tcp Flags	Sets the TCP flags.
Tcp Flags Mask	Sets the TCP flags mask.

MAC ACL Configuration

Device Console > Configure > Access Control List > *MAC ACL*

Use this tab to configure MAC ACLs.

Table 323 MAC ACL field descriptions

Field	Description
ACL	MAC ACL rule number.
In Ports	Sets the complete set of ports over which if the packet arrives the filter rule will be applicable. If the incoming port list is 0 (zero), the filter rule is applicable for all the incoming ports. By default in-port list is maintained as 0.
Out Ports	This field is applicable only if the filter action is set to `allow`. If the outgoing port list is non-zero, the packet will be sent over the specified ports only. If the outgoing port list is 0 (zero), the port over which the packet is to be switched will be based on further processing on the packet. By default, the out-port list is maintained as 0.
Protocol Type	Sets the non IP protocol type to be filtered. The values are: `aarp, amber, dec-spanning, decnet-iv, diagnostic, dsm, etype-6000, etype-8042, lat, lavc-sca, mop-console, mop-dump, msdos, mump, netbios, vines-echo, vines-ip, xns-idp` A value of 0 (zero) means the filter is applicable for all protocols.
Source Address	Sets the source MAC address to be matched with the packet.
Destination Address	Sets the destination MAC address to be matched with the packet.
VLAN	Sets the VLAN ID to be filtered. A value of 0 (zero) means no VLAN is configured for filtering
Action	Sets the action to be taken on the packet if the filter rule matches. If the action is `allow`, the packet will be forwarded according to the forwarding rules. If the action is `drop`, the packet will be discarded.
Statistics Status	Sets the stats status (true or false).
Mirror	Enables or disable port mirroring.
Mirror Port	Sets the port to which the packets matching the ACLs should be mirrored. This attribute is operational only when mirroring is enabled.
User Priority	Sets the user priority. A value of -1 means no user priority is configured.

IP ACL Configuration

Device Console > Configure > Access Control List > *IP ACL*

Use this tab to configure IP ACLs.

Table 324 IP ACL field descriptions

Field	Description
ACL	IP ACL rule number.
In Ports	Sets the complete set of ports over which if the packet arrives the filter rule will be applicable. If the incoming port list is 0 (zero), the filter rule is applicable for all the incoming ports. By default in-port list is maintained as 0.
Out Ports	This field is applicable only if the Filter Action is set to `allow`. If the outgoing port list is non-zero, the packet will be sent over the specified ports only. If the outgoing port list is 0 (zero), the port over which the packet is to be switched will be based on further processing on the packet. By default out-port list is maintained as 0.
Type	Sets the category of IP filters. Standard IP filter provides the basic IP filter option (IP address/mask) whereas extended IP filter provides additional options (Protocol, TCP/UDP Port numbers, TCP flags, TOS, DSCP and ICMP types). This attribute needs to be set before configuring the other attributes of this table.
Protocol Type	Sets the protocol type to be checked against the packet.
Message Type	Sets the message type to be checked against the packet.
Message Code	Sets the message code to be checked against the packet.
Source Address	Sets the source IP address to be matched with the packet.
Source Mask	Sets the IP subnet mask for source IP address.
Destination Address	Sets the destination IP address to be matched with the packet.
Destination Mask	Sets the IP subnet mask for destination IP address.
Min Source Protocol Port	Sets the minimum port in the source port range.
Min Destination Protocol Port	Sets the minimum port in the destination port range.
Max Source Protocol Port	Sets the maximum port in the source port range.
Max Destination Protocol Port	Sets the maximum port in the destination port range.
ACK Bit	Sets the TCP ACK bit to be checked against the packet.
RST Bit	Sets the TCP RST bit to be checked against the packet.

Table 324 IP ACL field descriptions

Field	Description
FIN Bit	Sets the TCP FIN bit to be checked against the packet.
SYN Bit	Sets the TCP SYN bit to be checked against the packet.
URG Bit	Sets the TCP URG bit to be checked against the packet.
PSH Bit	Sets the TCP PSH bit to be checked against the packet.
IP TOS Bit	Sets the IP TOS bit to be checked against the packet.
DSCP	Sets the IP DSCP value to be checked against the packet.
Action	Sets the action to be taken on the packet if the filter rule matches.
Statistics Status	Sets whether ACL's Hit Count to be maintained or not.
Mirror	Enables or disable port mirroring.
Mirror Port	Sets the port to which the packets matching the ACLs should be mirrored. This attribute is operational only when mirroring is enabled.

Configuring CEE (Converged Enhanced Ethernet)

The following sections describe the configuration tasks associated with CEE:

CEE General Configuration

Device Console > Configure > CEE > *General*

Use the **CEE General** tab to enable or disable the global state.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Priority Allocation Configuration

Device Console > Configure > CEE > *Priority Allocation*

Use the **CEE Priority Allocation** tab to set Priority Group for the configured Priority.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 325 Priority Allocation field descriptions

Field	Description
Priority	Priority value (0-7).
Priority Group	Priority Group configured for the priority (0-7, no bandwidth limit).

Bandwidth Allocation Configuration

Device Console > Configure > CEE > *Bandwidth Allocation*

Use the **CEE Bandwidth Allocation** tab to set Bandwidth for the Priority Groups.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 326 Bandwidth Allocation field descriptions

Field	Description
Priority Group	Priority Group index.
Bandwidth	Bandwidth range (0-100).

PFC (Priority Flow Control) Configuration

Device Console > Configure > CEE > *PFC*

Use the PFC tab to enable or disable the global PFC state.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

PFC Status Configuration

Device Console > Configure > CEE > *PFC Status*

Use the **PFC Status** tab to enable or disable the global PFC status of individual priority.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 327 PFC Status field descriptions

Field	Description
Priority	Priority value (0-7).
Global PFC Status	PFC status (enabled or disabled).

Port PFC Configuration

Device Console > Configure > CEE > *Port PFC*

Use the **Port PFC** tab to enable or disable the PFC status of individual ports.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 328 Port PFC field descriptions

Field	Description
Port	Port number.
PFC status	PFC status for the port (enabled or disabled).

Port PFC Status Configuration

Device Console > Configure > CEE > *Port PFC Status*

Use the **Port PFC Status** tab to enable or disable the PFC status of port and priority combination.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 329 Port PFC Status field descriptions

Field	Description
Port	Port number.
Priority	Priority value.
PFC status	PFC status (enabled or disabled).

DCBX (Data Center Bridging Capability Exchange) Protocol Configuration

Device Console > Configure > CEE > *DCBX*

Use the **DCBX** tab to configure various features of DCBX.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 330 DCBX field descriptions

Field	Description
Port	Port number.
DCBX State	DBCX status (enabled or disabled).
ETS Willing	ETS Willing setting (enabled or disabled).
ETS Advertise	ETS Advertise setting (enabled or disabled).
PFC Willing	PFC Willing setting (enabled or disabled).
PFC Advertise	PFC Advertise setting (enabled or disabled).
App Protocol Willing	App Protocol Willing setting (enabled or disabled).
App Protocol Advertise	App Protocol Advertise setting (enabled or disabled).

Configuring Multicast Priority

Device Console > Configure > CEE > *Multicast Priority*

This provides information on Multicast Priority Allocation.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 331 CEE Multicast priority field descriptions

Field	Description
Multicast Priority	Multicast Priority
Group Number	Multicast Priority Group Number

Configuring Multicast Bandwidth Allocation

Device Console > Configure > CEE > *Multicast Bandwidth Allocation*

This provides information on Multicast Bandwidth Allocation.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 332 CEE Multicast Bandwidth Allocation field descriptions

Field	Description
Multicast Priority Group	Multicast Priority Group
Multicast Group Bandwidth	Multicast Group Bandwidth
Description	Description

Configuring FCoE (Fiber Channel over Ethernet)

The following sections describe the configuration tasks associated with FCoE:

FIP Snooping Configuration

Device Console > Configure > FCoE > *FIP Snooping*

Use the **FIP Snooping** tab to set the FIP Snooping global state and ACL timeout.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 333 FIP Snooping field descriptions

Field	Description
Global State	FIP state (on or off).
ACL Timeout	ACL Timeout setting (enabled or disabled).
Auto VLAN	Auto VLAN setting (enabled or disabled)

FIP Snooping Port Configuration

Device Console > Configure > FCoE > *FIP Snooping Port*

Use the **FIP Snooping** tab configure FIP Snooping Ports.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 334 FIP Snooping Port field descriptions

Field	Description
Port	Port number.
FCF Mode	Fiber Channel Forwarding mode (on, off, auto)
State	FIP Snooping state for the port (enabled or disabled)

Configuring Switch Partition

The following sections describe the configuration tasks associated with Switch Partition (SPAR). This section covers the following topics:

SPAR IDs Configuration

Device Console > Configure > SPAR > *IDs*

Use the **SPAR IDs** tab to configure SPAR IDs.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this information if it does not apply to your switch.

Table 335 SPAR IDs field descriptions

Field	Description
ID	The SPAR ID.
Name	Sets the SPAR name.
State	Enables or disables the SPAR state.
Uplink Type	Sets the Uplink Type: Port, Trunk, or Admin Key.
Uplink Port	Sets the SPAR uplink port.
Uplink Trunk	Sets the SPAR uplink trunk.
Uplink Adminkey	Sets the SPAR uplink adminkey.
Domain Mode	Sets the SPAR domain mode: passthrough, local
Default Domain Server Port List	Sets the SPAR default domain server port list.
Default Domain SPAR VID	Sets the SPAR default domain SPAR VID.

SPAR Local Domains Configuration

Device Console > Configure > SPAR > *Local Domains*

Use the **Local Domains** tab to configure SPAR local domains.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this information if it does not apply to your switch.

Table 336 SPAR Local Domains field descriptions

Field	Description
ID	The local domain SPAR ID.
IVID	The local domain IVID.
Server Port List	Sets the SPAR local domain server port list.
VID	Sets the SPAR local domain VID.
Name	Sets the SPAR local domain name.
State	Enables or disables the SPAR local domain state.

Configuring Virtualization

Use virtualization to configure VMready features. This section covers the following virtualization topics:

Note: The following features are available only for VMready capable switches. Please disregard this information if it does not apply to your switch. vNIC Configuration is presently available only on the VMready switches BNT Rackswitch G8124 and BNT 10-port 10Gb Ethernet Switch Module.

General VM Configuration

Device Console > Configure > Virtualization > *General*

Use this feature to enable or disable VMReady.

The following table describes the fields of the Virtualization's **General** configuration tab.

Table 337 Virtualization General field descriptions

Field	Description
VMReady	Enables or disables VMReady.

Server port configuration allows you to set the server ports on RackSwitches, such as the G8000 and G8124.

Table 338 Virtualization Server Port field descriptions

Field	Description
Server ports	Selects the switch ports to assign as server ports.

VMware vCenter Configuration

Device Console > Configure > Virtualization > *VMware vCenter Access*

Use this feature to set UDP port number used by ESX/ESXi server to send heartbeat message periodically to Virtual Center and configure VMware Virtual Center access information.

The following table describes the fields of the **VMware vCenter Access** configuration tab.

Table 339 VMware vCenter Access field descriptions

Field	Description
ESX/ESXi server to vCenter heartbeat UDP port	Set ESX/ESXi server to vCenter heartbeat UDP port number
Server IP Address	IP address of the system on which Virtual Center is running. You can select the Server IP address from the drop-down list, which shows the Virtual Centers configured in SNSC.
User Name	User name for the Virtual Center
Password	Password for the Virtual Center
Certificate Authentication	Enables or disables certificate authentication.

VM Profiles Configuration

Device Console > Configure > Virtualization > *Profiles*

Use this feature to configure VM Profiles.

Configuration of VMs with the VM Agent requires the use of VM profiles, which ease the configuration and management of VM Agent-based VM groups. The VM profile contains a set of properties that will be configured on the Virtual Switch.

After a VM profile has been defined, it can be assigned to a VM group or exported to one or more VMware hosts

The following table describes the fields of the **Profiles** configuration tab.

Table 340 Virtualization Profiles field descriptions

Field	Description
Name	Name of the profile
Vlan	Sets the VM profile's VLAN ID
Traffic Shaping Parameters - Average Bandwidth	Sets the average traffic, in Kilobits per second for the hypervisor's traffic shaping parameter.
Traffic Shaping Parameters - Burst Size	Sets the maximum burst size, in Kilobytes, for the hypervisor's traffic shaping parameter.
Traffic Shaping Parameters - Peak Bandwidth	Sets the peak traffic, in Kilobits per second, for the hypervisor's traffic shaping parameter.
Egress Shaping Parameters - Egress Average Bandwidth	Sets the Egress average traffic, in Kilobits per second for the hypervisor's traffic shaping parameter.
Egress Shaping Parameters - Egress Burst Size	Sets the maximum Egress burst size, in Kilobytes, for the hypervisor's traffic shaping parameter.
Egress Shaping Parameters - Egress Peak Bandwidth	Sets the Egress peak traffic, in Kilobits per second, for the hypervisor's traffic shaping parameter.

VM Groups Configuration

Device Console > Configure > Virtualization > *Groups*

Use this feature to configure VM Groups.

A VM group is a collection of members, such as VMs, ports, or trunk groups. Members of a VM group share certain properties, including VLAN membership, ACLs (VMAP), and VM profiles.

The following table describes the fields of the **Groups** configuration tab.

Table 341 Virtualization Groups field descriptions

Field	Description
Group Number	VM group number
Validation Mode	Sets the group validation mode: disable, basic, advanced.
Profile	Adds the selected VM profile to the VM group.
Vlan	Assigns a VLAN to this VM group. If you do not assign a VLAN to the VM group, the switch automatically assigns an unused VLAN when adding a port or a VM to the VM Group. **Note:** If you add a VM profile to this group, the group will use the VLAN assigned to the profile.
Tag State	Enables or disables VLAN tagging on ports in this VM group.
Ports	Adds the selected port to the VM group. **Note:** Add a port to a VM group only if no VMs on that port are members of the VM group.
Trunk ID	Assigns the trunk group to the VM group.
LACP Adminkey	Assigns an LACP admin key to the VM group. LACP trunks formed with this admin key will be included in the VM group.
VMAP for Non Server Ports	Assigns the selected VLAN Map to this VM group, limiting the operation of the VLAN Map to non-server ports only.
VMAP for Server Ports	Assigns the selected VLAN Map to this VM group, limiting the operation of the VLAN Map to server ports only.
VMAP for All Ports	Assigns the selected VLAN Map to this VM group with the operation of the VLAN Map extending to non-server and Server ports.

VM Bandwidth Configuration

Device Console > Configure > Virtualization > *Bandwidth*

Use this feature to limit the Transmit Bandwidth for each VM.

The following table describes the fields of the **Bandwidth** configuration tab.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 342 Virtualization Bandwidth field descriptions

Field	Description
MAC	MAC address of the virtual machine.
ACL for Transmit Bandwidth	The ACL assigned to the transmission rate. The ACL is assigned automatically, in sequential order, if not specified. If there are no available ACLs, the Transmit Rate cannot be configured. Each Transmit Rate configuration reduces the number of available ACLs by one.
Control Status	Enables or disables bandwidth control on the VM policy
Committed TX Rate	The amount of bandwidth available to traffic transmitted from the VM to the switch, in kilobits per second. Enter the value in multiples of 64.
Maximum TX Burst Size	The maximum burst size for transmission, in Kilobits. Enter one of the following values: 32, 64, 128, 256, 512, 1024, 2048, 4096.
Committed RX Rate	The amount of bandwidth available to traffic received from the VM to the switch, in kilobits per second. Enter the value in multiples of 64.
Maximum RX Burst Size	The maximum burst size for receiving, in Kilobits. Enter one of the following values: 32, 64, 128, 256, 512, 1024, 2048, 4096.

VM Check Configuration

Device Console > Configure > Virtualization > VMready > *VM Check*

Use the **VM Check** tab for configuring the validations.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 343 VM Check field descriptions

Field	Description
Basic Mode Validation	Sets basic checking mode: log, link
Advanced Mode Validation	Sets advanced checking mode: log, link, acl
Max ACLs for Spoofed MACs	Sets value for the maximum number of ACLs that can be used by MAC Spoofing Check feature.
Trusted Ports	Add ports to configured trusted port list or remove ports from the configured trusted port list.

VM Hello Configuration

Device Console > Configure > Virtualization > VMready > *VM Hello*

Use the **VM Hello** tab for configuring Hello advertising.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 344 VM Hello field descriptions

Field	Description
Hello Advertisements	Sets the Hello advertising status.
Ports	Add ports to configured Hello port list or remove ports from the configured Hello port list.
Hello Address	Sets the VM Hello IP address.
Hello Periodicity	Sets the Hello packet send interval.

VM Ports Configuration

Device Console > Configure > Virtualization > *Ports*

Use this feature to assign the configured VM Group to non-server (Uplink) and server ports.

The following table describes the fields of the **Ports** configuration tab.

Table 345 Virtualization Ports field descriptions

Field	Description
Status	Color coded graphics showing the status: Green for up and Red for down.
Port	The non-server (Uplink) or server port number.
Group	Configured VM Group. Double-click the cell to configure a new value.
Trunk #	Trunk number to which the port is associated.
LACP Key #	LACP key number to which the port is associated.

Virtual Machines Configuration

Device Console > Configure > Virtualization > *Virtual Machines*

Use this feature to assign the configured VM Group to VMs.

The following table describes the fields of the **Virtual Machines** configuration tab.

Table 346 Virtual Machines field descriptions

Field	Description
Filter by Group	Lists only entries associated with the selected VM group.
Virtual MAC	MAC address of the virtual machine.
Group	Configured VM Group. Double-click the cell to configure a new value.
IP Address	IP Address of the Virtual Machine.
VM Name	Name of the discovered virtual machine. If the VM Management Server Connector is not configured, this field is blank.
Hypervisor	Name of the Hypervisor on which the VM is running. If the VM Management Server Connector is not configured, this field is blank.
VLAN	VLAN to which the Virtual Machine is associated.
Port	Server Port on which VM is discovered by the switch

VM Advanced Pre-Provisioning

Device Console > Configure > Virtualization > *Advanced Pre-Provisioning*

Use this feature to Pre-provision the VMs by assigning the VM Group to each selected VM.

Note: The VMs listed in the table are retrieved from Virtual Center and not learned by the switch. In addition, the VMs are listed only if the VM Management Server is configured.

The following table describes the fields of the **Advanced Pre-Provisioning** configuration tab.

Table 347 Advanced Pre-Provisioning field descriptions

Field	Description
Global Group	The VM group to use when VM group is NOT selected for the selected VM.
Virtual MAC	MAC address of the virtual machine.
Group	Configured VM Group. Double-click the cell to configure a new value.
IP Address	IP Address of the Virtual Machine.
VM Name	Name of the discovered virtual machine. If the VM Management Server Connector is not configured, this field is blank.
Hypervisor	Name of the Hypervisor on which the VM is running. If the VM Management Server Connector is not configured, this field is blank.
vCenter Name	The VM ware Virtual Center address
VLAN	VLAN to which the Virtual Machine is associated.
Port Group	Port Group to which the Virtual Machine is associated.

vNIC General Configuration

Device Console > Configure > Virtualization > vNIC > *General*

Use this tab to enable or disable vNIC configuration on the switch.

Table 348 vNIC General field descriptions

Field	Description
Global vNIC On/Off	Enables or disables the vNIC configuration feature.
Uplink Sharing	Enables or disables vNIC uplink sharing.
Egress Metering State	Enables or disables vNIC egress metering.

vNIC Port Configuration

Device Console > Configure > Virtualization > vNIC > *vNIC*

Use this to configure vNICs on switch server ports.

Table 349 vNIC Port field descriptions

Field	Description
Port	Server port on which the vNIC is configured
vNIC	vNIC ID (1-4)
State	Operational state of the vNIC (enabled or disabled)
Max Bandwidth	Maximum bandwidth allocated to the vNIC

vNIC Group Configuration

Device Console > Configure > Virtualization > vNIC > *vNIC Groups*

Use this tab to configure vNIC groups on the switch.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 350 vNIC Groups field descriptions

Field	Description
Group Number	vNIC group ID (1-32).
State	Operational state of the vNIC group (enabled or disabled).
VLAN	VLAN associated with the vNIC group.
Failover state	Failover state of the vNIC group (enabled or disabled).
Key	Uplink LACP admin key in the vNIC group.
vNIC	vNICs associated with the vNIC group.
Server Ports	Server ports associated with the vNIC group.
Uplink Type	Sets the uplink type (port or trunk). Depending on the selection, SNSC chooses either port or trunk data while configuring vNIC groups on the switch.
Port	The port associated with the vNIC group. **Note**: Applicable only if the Uplink Type is set to `Port`.
Trunk	The trunk associated with the vNIC group. **Note**: Applicable only if the Uplink Type is set to `Trunk`.

EVB General Configuration

Device Console > Configure > Virtualization > EVB > *General*

Use this tab to configure Edge Virtual Bridging (EVB) VSI DB update and clean operations.

Table 351 EVB General field descriptions

Field	Description
VSI DB Operation	Sets the VSI DB Operation to none, update or clean. The default setting is none, which indicates no operation. If you select update option and click **Submit**, then the switch will pull VSI Types from the VSI DB Manager. If you select clean option and click **Submit**, the VSI Types on the switch will be deleted.
Clean Associated VSI	Cleans the associated VSI from the switch.

EVB Profiles Configuration

Device Console > Configure > Virtualization > EVB > *Profiles*

Use this tab to configure Edge Virtual Bridging (EVB) profiles.

Table 352 EVB Profiles field descriptions

Field	Description
Profile Number	The profile index number.
Reflective Relay	Enables or disables the reflective relay.
VSI Discovery	Enables or disables VSI discovery.

VSI DB Host Configuration

Device Console > Configure > Virtualization > EVB > *VSI DB Host*

Use this tab to configure the VSI Database Host.

Note: This field might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 353 VSI DB Host field descriptions

Field	Description
Index	The index number. The index is always 1.
VSI DB Host Address	Sets the IP address of VSI DB Manager.
VSI DB Host Port	Sets the port on which VSI DB Manager is listening for processing RESTful requests.
Doc Path	Sets the resource path.
Doc File	Sets the resource name.
Interval	Sets the VSI DB automatic update interval (5-300 s). Set the interval to 0 (zero) to disable automatic updates.
Port	The port the switch uses to connect to the VSI DB server, such as mgt, extm, or data.

Configuring iSwitch Virtual Data Station

The following sections describe iSwitch vCenter and Virtual Data Station configuration tasks you can perform:

vCenter Configuration

Device Console > Configure > Virtualization > iSwitch > *vCenter*

Use this tab to configure iSwitch vCenter parameters.

Table 354 vCenter field descriptions

Field	Description
vCenter IP Address	Sets the IP address of the vCenter.
User Name	Sets the user name associated with the vCenter.
Password	Sets the user password.
Port	Sets the port on which vCenter is listening.
Apply/Delete vCenter Configuration	Applies or deletes the vCenter configuration, depending on the radio button selection.

Virtual Data Station Configuration

Device Console > Configure > Virtualization > iSwitch > *Virtual Data Station*

Use this tab to configure iSwitch Virtual Data Station parameters.

Table 355 Virtual Data Station field descriptions

Field	Description
vDS Name	Sets the name for virtual data station (vDS).
DataCenter Name	Sets the name of the datacenter associated with the vDS.
Apply/Delete VDS Configuration	Applies or deletes the VDS configuration, depending on the radio button selection.

Configuring Unified Fabric Port (UFP)

The following sections describe the configuration tasks associated with UFP:

UFP General Configuration

Device Console > Configure > Virtualization > UFP > *General*

Use this tab to configure general UFP parameters.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 356 UFP General field descriptions

Field	Description
UFP	Enables or disables UFP.

UFP Ports Configuration

Device Console > Configure > Virtualization > UFP > *Ports*

Use the **Ports** tab to configure UFP port parameters.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 357 UFP Port field descriptions

Field	Description
Index	The port number.
State	Enables or disables UFP on the selected port.

UFP Virtual Ports Configuration

Device Console > Configure > Virtualization > UFP > *Virtual Ports*

Use the **Virtual Ports** tab to configure UFP virtual port parameters.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 358 UFP Virtual Port field descriptions

Field	Description
Port Index	The port number of the vPort.
vPort Index	The virtual port number of the vPort.
State	Enables or disables virtual port State.
Network Mode	Sets the virtual port network mode.
Network Default VLAN	Sets the virtual port default VLAN.
Network Default Tag	Enables or disables the virtual port tag state.
QoS Min Guaranteed Bandwidth	Sets the QoS minimum guaranteed bandwidth.
QoS Max Allowed Bandwidth	Sets the QoS maximum allowed bandwidth.

Using the VMready Across the Datacenter Wizard

The VMready Across the Datacenter Wizard provides a step by step approach to configure VMready features across all supported switches. The features include VM Server configuration, Hypervisor configuration, VM Groups configuration, Virtual Machines configuration, VMAP configuration, Server Ports configuration (this is applicable only for RackSwitches), Port Groups, and vSwitch Configuration. It provides an interface to directly deploy the configuration created across the various VMready switches. Some of the steps are not mandatory and can be skipped during the configuration.

The Wizard steps you through the configuration process. The topics in this chapter cover the following procedures:

Configuring VMready Across the Datacenter Wizard

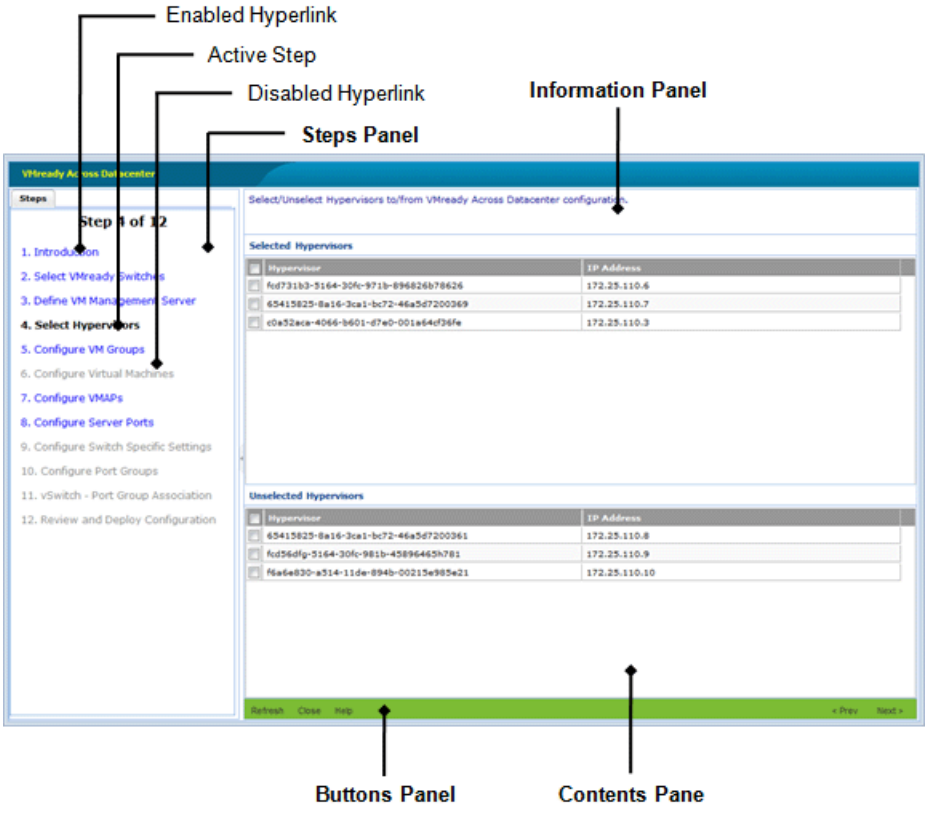
Device List > Virtualization Tools > *VMready Across Datacenter*

Figure 67 on page 644 shows the layout of the Wizard screen, which is comprised of two panels, a left panel indicating the steps of configuration available in the Wizard and a content panel showing the configurations for the corresponding step. Based on the content panel configuration, the corresponding step is highlighted in the left side panel. You also can navigate to any step by clicking on any step, which doubles as a hyperlink. Note that the hyperlink is activated only after visiting that step.

Note 1: Only admin-level users can perform Wizard configuration and deployment.

Note 2: Before you use the VMready Across the Datacenter Wizard for the the TOR G8264CS, G8264-T, and the RackSwitch G8000, G8052, G8124, G8264, and G8316, ensure that the Virtual Machine Groups setting is enabled.

Figure 67 VMready Across the Datacenter—Wizard Layout



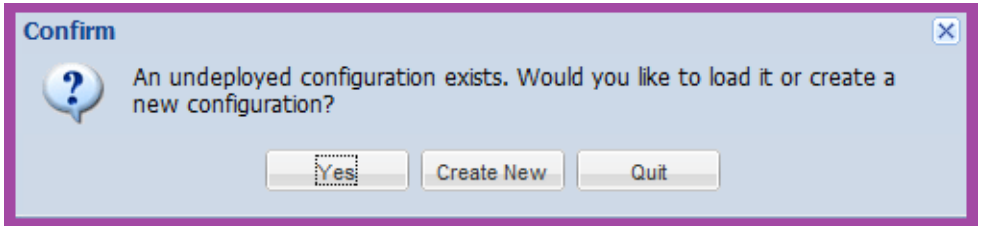
The content panel has three sections, as follows:

- Information panel at the top displays a summary of the configuration for the particular step.
- Content pane in the center allows you to view and edit the configuration. Note: When you modify data in a cell, the cell appears blue until the change is saved.
- Buttons menu at the bottom allows you perform various actions and traverse across the Wizard.

Note 1: The steps listed in the left panel are displayed when the VM Management Server is configured. If VM Management Server is not configured, then some steps are not visible.

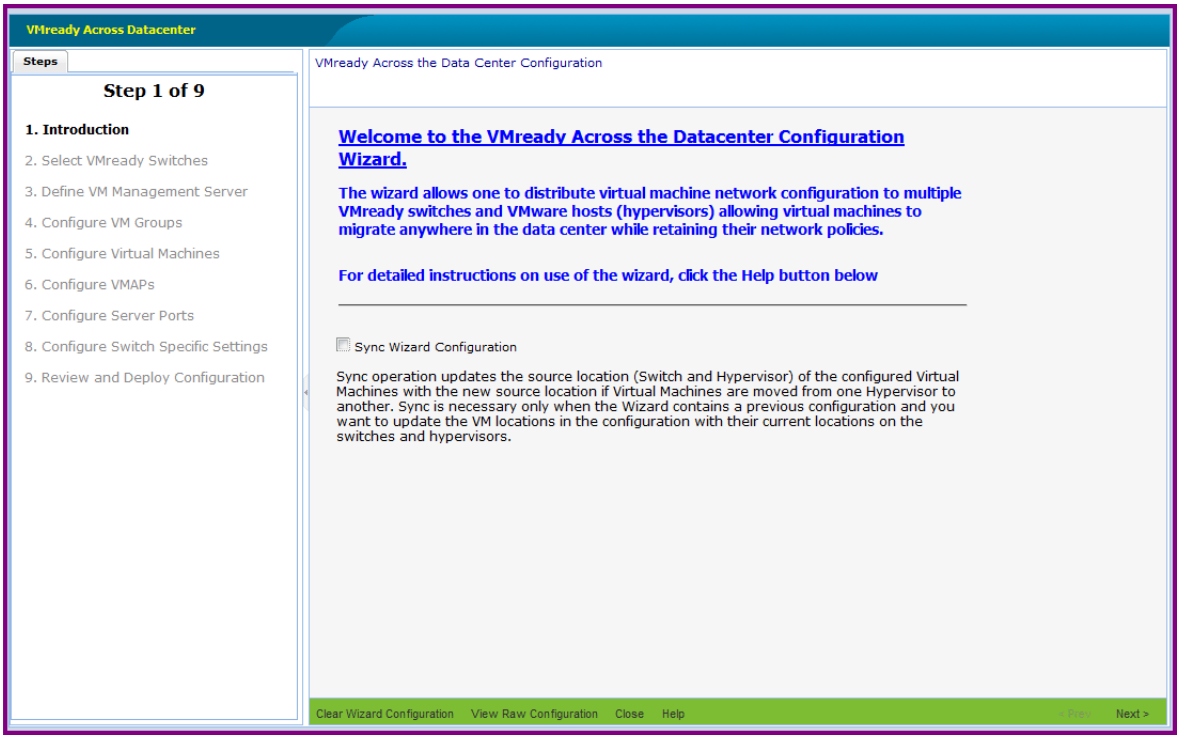
Note 2: If an undeployed configuration exists, upon launch of the Wizard you are presented with a dialog box with options to load an existing configuration or create a new configuration as shown in Figure 68 on page 645.

Figure 68 VMready Across the Datacenter—Launch Dialog



The introduction step of the Wizard does not perform any configuration. However, this step provides an option for the user to synchronize the previous configuration, clear any existing configuration or view the XML configuration in HTML format (see Figure 69 on page 646).

Figure 69 VMready Across the Datacenter—Wizard Introduction



Button/Checkbox	Description
Sync Wizard Configuration	Synchronizes the VM source addresses in the existing configuration by checking with VM Management Server and the configured VMready switches.
Clear Wizard Configuration	Clears the VMready Across the Datacenter Wizard configuration on the SNSC server.
View Raw Configuration	Opens a window showing the XML configuration, in HTML format (see Figure 71 on page 648).
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration.

Figure 70 VMready Across the Datacenter—XML Configuration in HTML Format

vm-domain

name	deployment-status
default	notyet

switches-list

vmready-switches

status	ipaddress	deploy-status	is-deleted	vmap-deploy-status
new	192.168.6.81	notyet	no	notyet
current	192.168.6.82	succeeded	no	succeeded
current	192.168.6.83	failed	no	succeeded

vmgroups-list

vmgroup

status	id	desc	VLAN	tag-state
new	1	vmg1	1	e

vmgroup-switch-conf

	switch-conf							
	status	ipaddress	ports	lacp-adminkey	trunkid	vmap-ports-srvr	vmap-ports-nonsrvr	vmap-ports-all
	new	192.168.6.81	INT1;MGT1	17-18				
	current	192.168.6.82	INT2;MGT1	17-18				
	current	192.168.6.83	INT3;MGT1	17-18				

vmgroup

status	id	desc	VLAN	tag-state
new	2	vmg2	2	e

vmgroup-switch-conf

switch-conf

Step 2: Select VMready Switches

This step lists all VMready switches discovered by Switch Center (SNSC) and allows you to select the VMready switches in the configuration. For a new configuration, the switches are listed in the Unselected VMready Switches table. You can drag-and-drop the switch(es) to the Selected VMready Switches table. You also can drag-and-drop the switch(es) from the Selected VMready Switches table to the Unselected VMready Switches table. See Figure 71 on page 648.

Note: The **Next** button is enabled only when one or more switches are added to the Select VMready Switches table.

Figure 71 VMready Across the Datacenter—Select VMready Switches

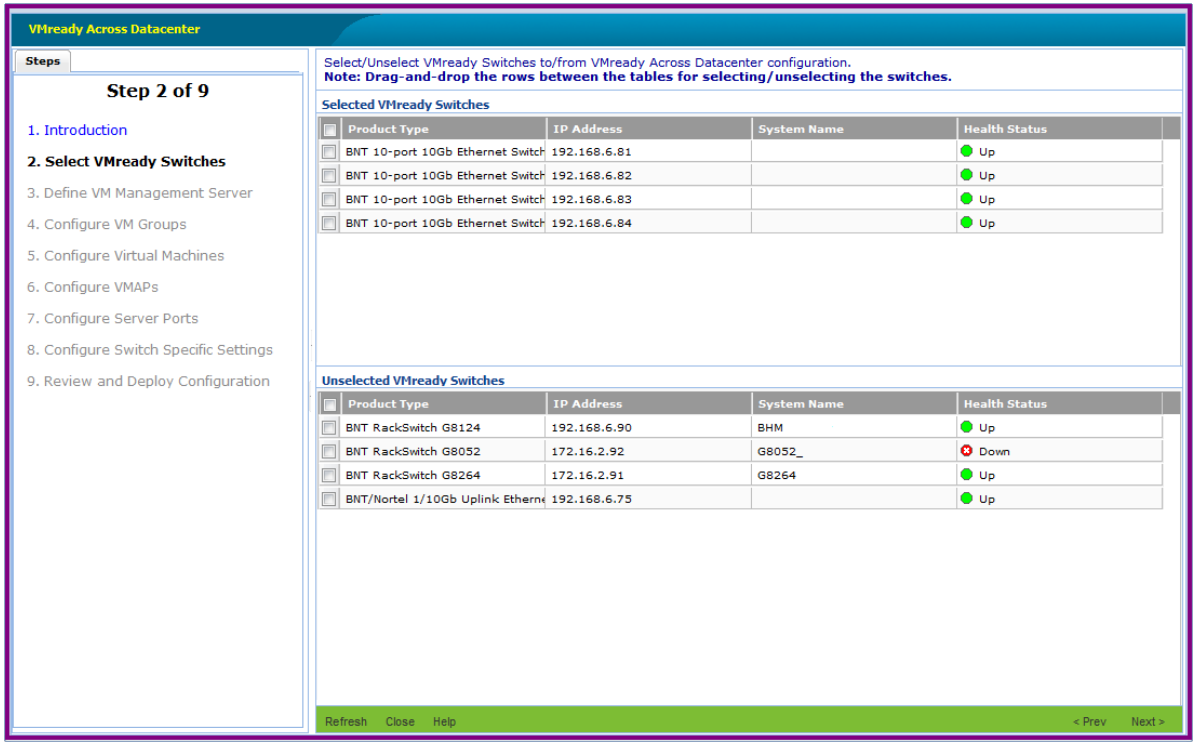


Table 359 Selected VMready Switches field descriptions

Field	Description
Product Type	Switch type (for example, BNT 10-port 10Gb Ethernet Switch Module).
IP Address	IP address of the VMready switch.

Table 359 Selected VMready Switches field descriptions

Field	Description
System Name	Configured system name (sysName)
Health Status	Health status of the switch (Up, Down, Critical or Non-Critical).

This step provides the following primary options:

Button	Description
Refresh	Refreshes the list of switches in the Unselected VMready Switches table.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the **Next** button is disabled until you add a VMready switch.
Prev	Moves to the previous step or page in the configuration.

Step 3: Define the VM Management Server

This step is required only for a VMware environment, for which the VM Management Server (vCenter) can be configured and Hypervisors can be added in the VMready configuration. This step is optional and clicking **Next** will take you to step 4: Configuring VM Groups.

A VM Management Server (vCenter) can be configured by checking the checkbox and specifying the VM Management Server address, login credentials, protocol and port details. It gives an option to test the values configured by clicking **Test**. See Figure 72 on page 651.

Note: The **Test** button is enabled only if the checkbox is selected and required values are entered.

Figure 72 VMready Across the Datacenter—Define VM Server

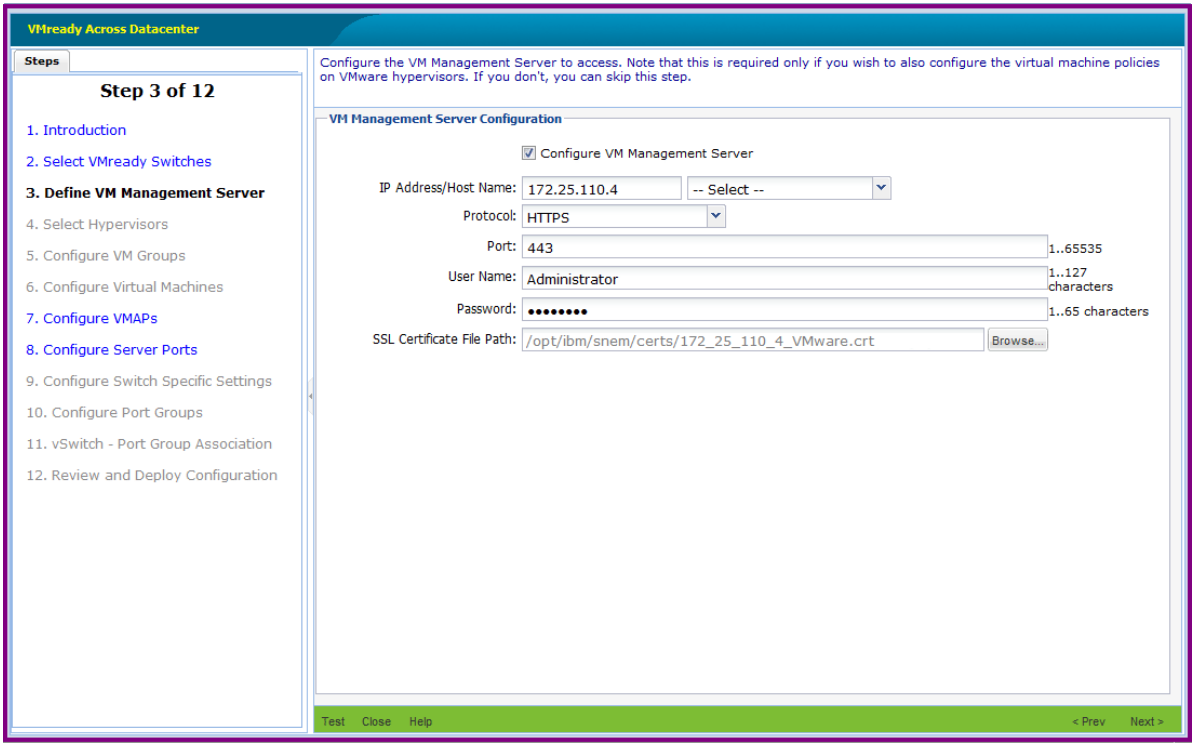


Table 360 Define VM Management Server field descriptions

Field	Description
Configure VM Management Server	Checkbox that enables/disables VM Management Server configuration. By default, it is unchecked (disabled).
Protocol	Protocol to use for communicating with VM Management Server. It is either HTTP or HTTPS.
Port	Port on which the VM Management Server is accessible when the above configured protocol is used.
IP Address/Host Name	IP address or host name of the VM Management Server.You can select the VM Management Server address from the drop-down list, which shows the VM Management Servers configured in SNSC.
User Name	User name to use for accessing the VM Management Server.
Password	Password associated with the user name.
SSL Certificate File Path	Path on the local system containing the SSL certificate to use in case of HTTPS Protocol setting.

Button	Description
Test	Tests the configured parameters for validity.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the **Next** button is disabled until you configure this step.
Prev	Moves to the previous step or page in the configuration.

Step 4: Select Hypervisors

This step is skipped if you did not configure a VM Management Server (vCenter) in step 3.

This page lists all hypervisors that are known to the configured VM Management Server (see “Step 3: Define the VM Management Server” on page 650). For a new configuration, the hypervisors are listed in the Unselected Hypervisors table. You can drag-and-drop the hypervisor(s) to the Selected Hypervisors table to select them. Likewise, you can drag-and-drop the hypervisor(s) from the Selected Hypervisors table to the Unselected Hypervisors. See Figure 73 on page 653.

Note: The **Next** button is enabled only when one or more hypervisors are added to the Select Hypervisors table.

Figure 73 VMready Across the Datacenter—Select Hypervisors

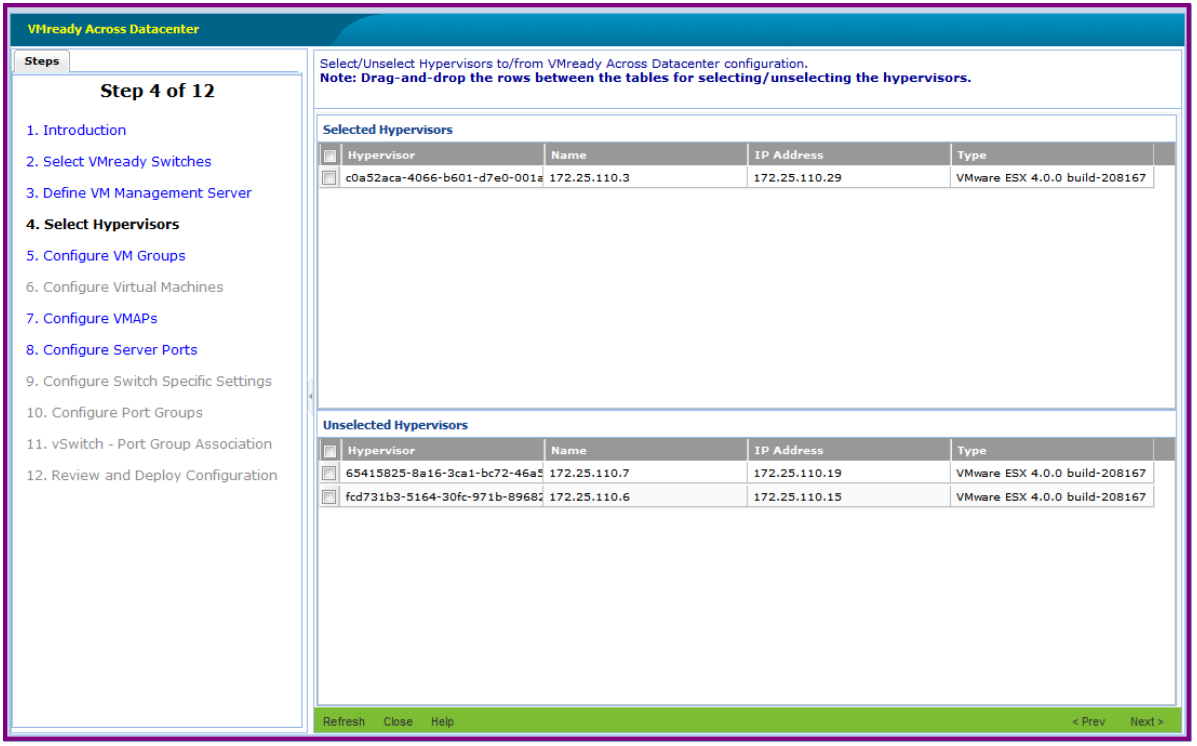


Table 361 Selected Hypervisors field descriptions

Field	Description
Hypervisor	Unique identifier (UUID) of the hypervisor.
Name	Name of the hypervisor.
IP Address	IP address of the hypervisor.
Type	Hypervisor type, including the version number and the build number.

This step provides the following primary options:

Button	Description
Refresh	Refreshes the list of switches in the Unselected Hypervisors table.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the **Next** button is disabled until you add a Hypervisor.
Prev	Moves to the previous step or page in the configuration.

Step 5: Configure VM Groups

This step lists the VM Groups configured by the Wizard. It also allows you to add new groups, modify any existing groups, and remove previously configured groups. See Figure 74 on page 655.

Note: For a new configuration, the VM Groups table is blank and the **Next** button is disabled until a VM Group is added.

Figure 74 VMready Across the Datacenter—Configure VM Groups

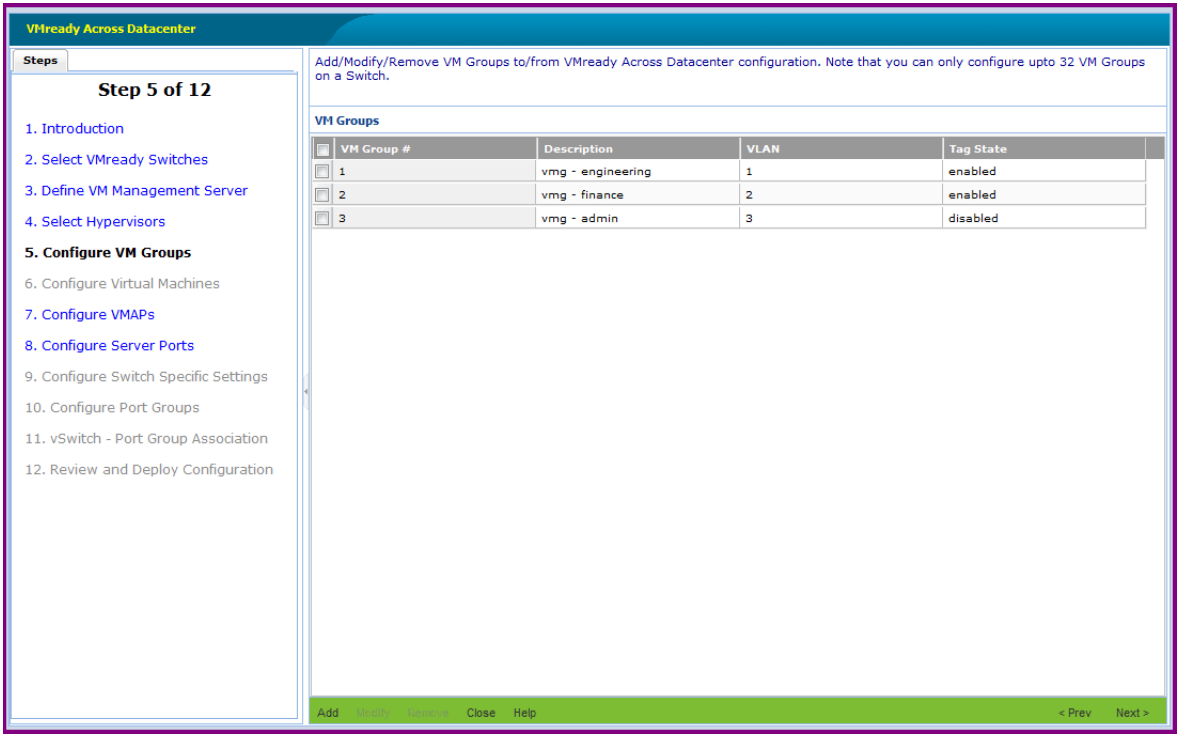


Table 362 Configure VM Groups field descriptions

Field	Description
VM Group #	VM Group number.
Description	Text description given to the VM Group for convenience. This description is local to SNSC and not relayed to the VMready switches.
VLAN	VLAN assigned to the VM Group.
Tag State	Tag state (enabled or disabled).

This step provides the following primary options:

Button	Description
Add	Opens a child window to add a VM Group.
Modify	Opens a child window that allows you to modify the selected VM Group. **Note**: This button is enabled only when a row is selected.
Remove	Removes the selected VM Group(s). **Note**: This button is enabled only when one or more rows are selected.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the **Next** button is disabled until you configure a VM group.
Prev	Moves to the previous step or page in the configuration.

Step 6: Configure Virtual Machines

This step lists the Virtual Machines (VMs) assigned to the VM groups created in step 5. For a new configuration the page is empty and you can add a VM or a pre-provisioned VM MAC to proceed with the Wizard configuration. You can filter the list based on the VM Group selected as shown in Figure 75 on page 657.

Figure 75 VMready Across the Datacenter—Configure Virtual Machines

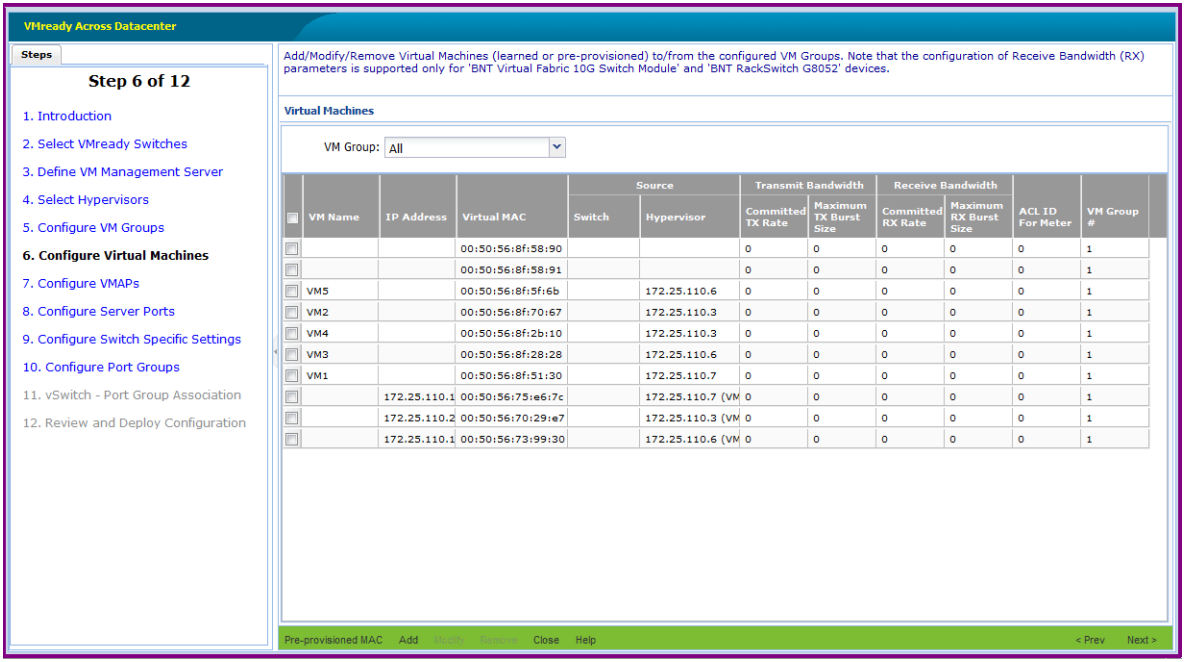


Table 363 Configure Virtual Machines field descriptions

Field	Description
VM Group	The VM Group drop-down list displays the configured VM Groups, plus a selection for “All”, which shows the VMs configured for all VM Groups. **Note**: This field is not part of the table, but is available above the table.
VM Name	Name of the Virtual Machine assigned to the VM Group. **Note**: If the VM is pre-provisioned, this field is blank.
IP Address	IP address of the VM. **Note**: If VM is pre-provisioned, this field is blank.
Virtual MAC	The MAC address of the VM.

Table 363 Configure Virtual Machines field descriptions

Field	Description
	Source
Switch	VMready switch which has discovered this VM. **Note**: This field can be blank.
Hypervisor	Hypervisor which has discovered this VM. **Note**: This field can be blank.
	Bandwidth Control Parameters
Committed TX Rate	Committed transmission rate.
Maximum TX Burst Size	Maximum transmission burst size.
Committed RX Rate	Committed receive rate.
Maximum RX Burst Size	Maximum receive burst size.
ACL ID For Meter	The ACL identifier.
VM Group #	The VM Group for which this VM is added (useful when the "All" option is selected in VM Group filter).

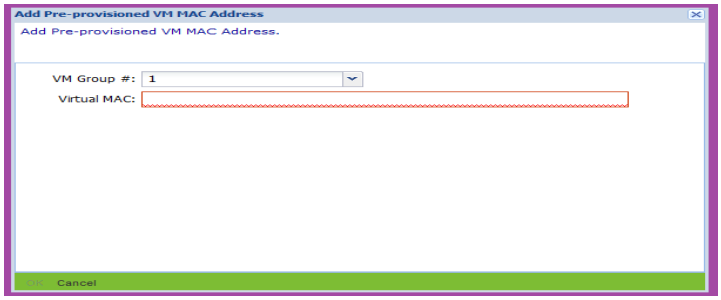
This step provides the following primary options:

Button	Description
Pre-provisioned MAC	Opens a child window to add a pre-provisioned VM MAC.
Add	Opens a child window to add a VM.
Modify	Opens a child window that allows you to modify the selected VM Bandwidth parameters. **Note**: This button is enabled only when a row is selected.
Remove	Removes the selected VM(s). **Note**: This button is enabled only when one or more rows are selected.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the **Next** button is disabled until you configure a Virtual Machine.
Prev	Moves to the previous step or page in the configuration.

Step 6.1: Pre-Provisioned VM MAC

You can pre-provision a VM which is not yet discovered by any of the VMready switches configured for this VMready configuration. On the Virtual Machines page, click **Pre-provisioned MAC**. This action launches a child window enabling the user to specify the VM MAC Address and the VM Group to which this pre-provisioned MAC is to be added. See Figure 76 on page 659.

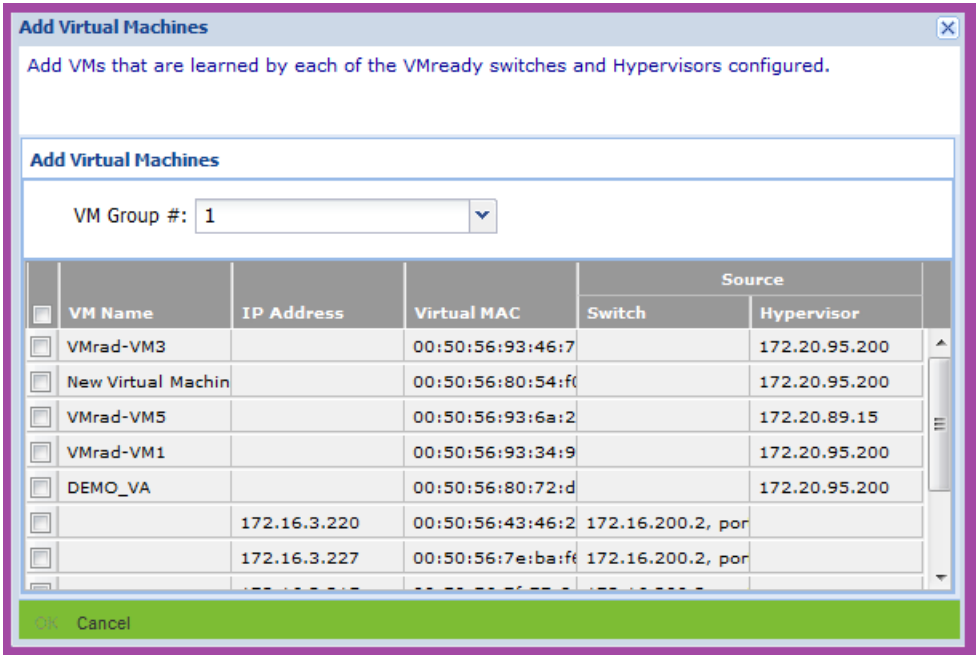
Figure 76 Add Pre-provisioned VM



Step 6.2: Add VMs Learned or Retrieved

Virtual Machines (VMs) can be learned by one or more VMready switches configured for this VMready configuration. VMs also can be retrieved from the VM Management Server (if it is configured). If these VMs are not yet discovered by VMready switches, from the Virtual Machine page you can click **Add**. This action launches a child window listing the VMs that are not yet added. See Figure 77 on page 660.

Figure 77 Add Virtual Machines

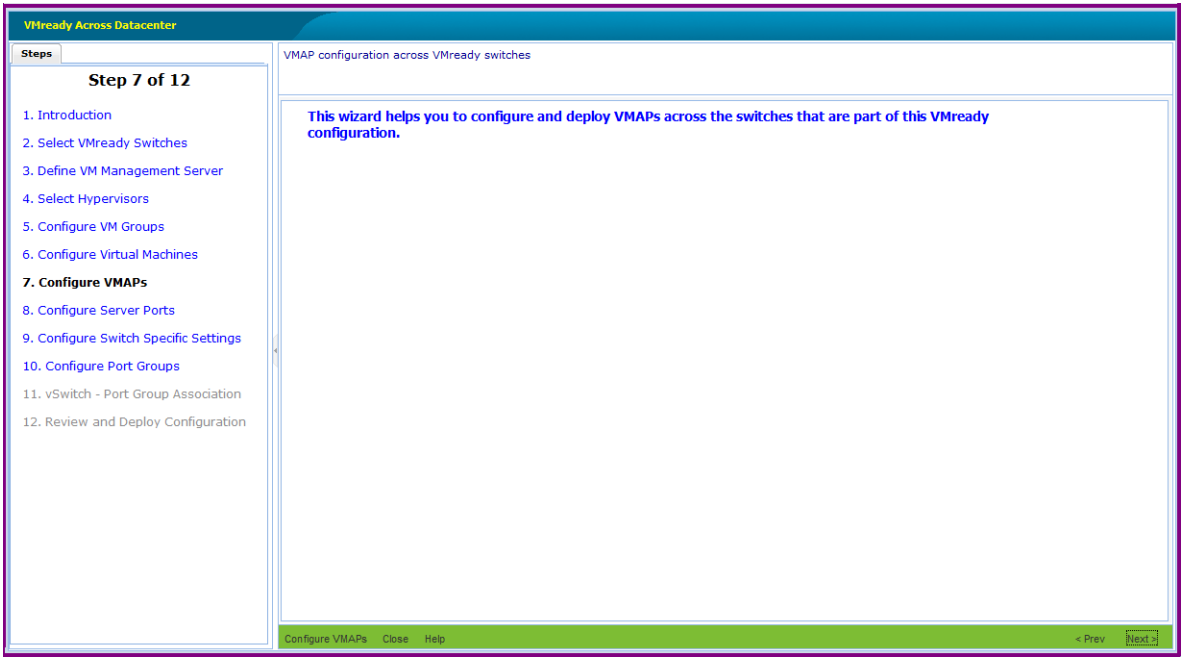


Step 7: VMAPs

This step allows you to create VMAPs across VMready switches specific to the VMready configuration. You can view, configure, and deploy VMAPs across VMready switches contained in the Wizard. See Figure 78 on page 661.

Note: This step is optional. Click **Next** to go to the Configure Switch Setting page.

Figure 78 VMready Across the Datacenter—VMAP Welcome Screen



This step provides the following options:

Button	Description
Configure VMAPs	Opens the window for configuring VMAPs.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration.
Prev	Moves to the previous step or page in the configuration.

Step 7.1: Configure VMAPs

To configure VMAPs, click **Configure VMAP** from the step 6 Welcome page. The VMAP Configuration table lists those VMAPs that are configured. It shows both deployed and Undeployed VMAP configurations on VMready switches. You can add a new VMAP or modify/delete an existing VMAP by clicking the appropriate button. See Figure 79 on page 662.

Note: The VMAP configuration table lists only few parameters associated with the VMAP. To view the complete data, click **Details**.

Figure 79 VMready Across the Datacenter—Configure VMAPs

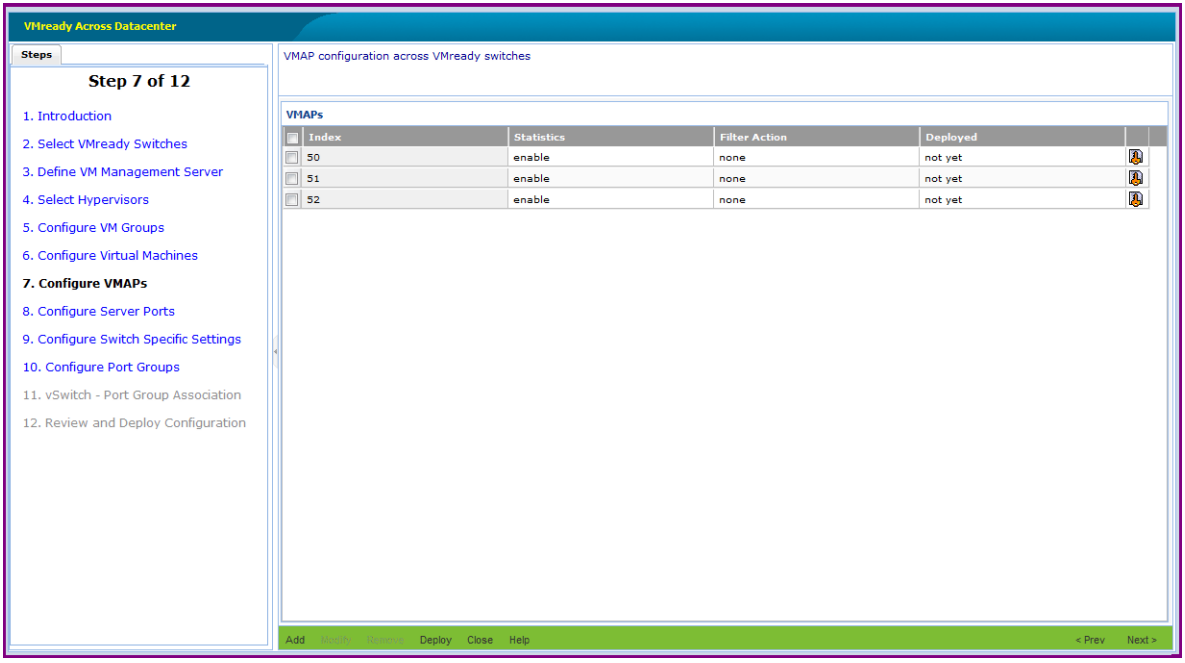


Table 364 Configure VMAPs field descriptions

Field	Description
Index	VMAP index number. Indices from 50 to 110 are reserved for the VMAP Wizard.
Statistics	Shows whether VMAP statistics is enabled or disabled.
Filter Action	Filter action setting.

Table 364 Configure VMAPs field descriptions

Field	Description
Deployed	Shows whether the VMAP is already configured/deployed (yes) on the switches or not (not yet).
Details	By clicking **Details**, you can view the complete VMAP configuration.

This step provides the following primary options:

Button	Description
Add	Opens a child window to add a new VMAP configuration.
Modify	Opens a child window to modify the VMAP configured. **Note**: This button is enabled only when a row is selected.
Remove	Removes the selected VMAP(S) configured. **Note**: This button is enabled only when a row is selected.
Deploy	Initiates the VMAP deployment to the VMready switches available in VMready configuration. **Note**: This button is enabled only if a VMAP entry exists. It deploys all the VMAPs that are in undeployed state.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration.
Prev	Moves to the previous step or page in the configuration.

Step 7.2: Add VMAP Configuration

To create a new VMAP configuration, in the Configure VMAP page, click **Add**. This opens a new dialog with various parameters that can be provided for the VMAP configuration. See Figure 80 on page 664. The fields are placed in different groups for ease of configuration. Enter the parameters in the dialog and click **Ok**.

Figure 80 Add New VMAP

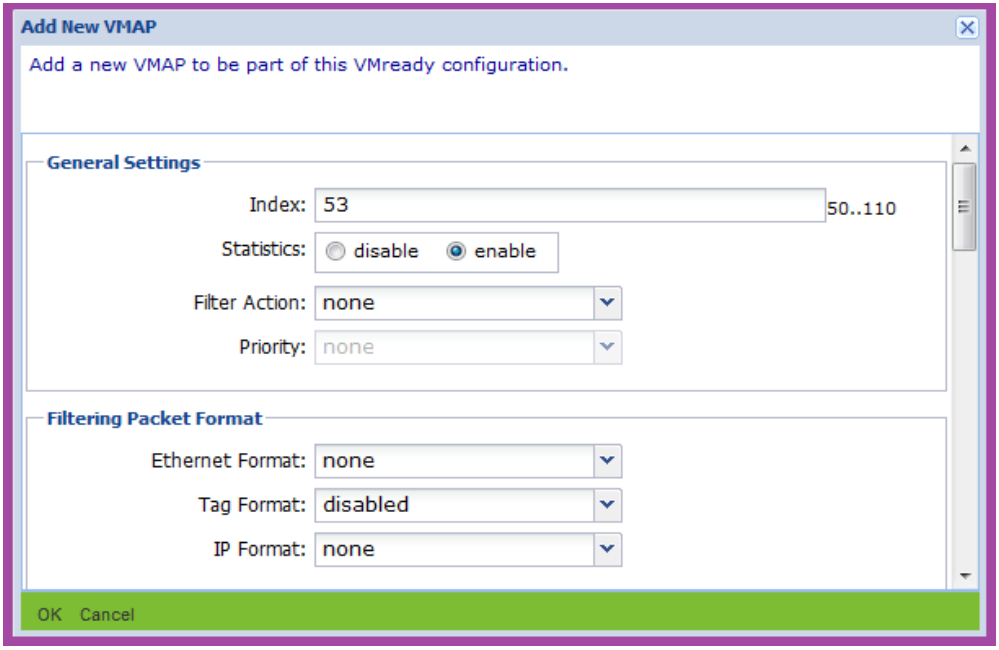


Table 365 Add VMAPs field descriptions

Field	Description
Index	The VMAP index. The value 50 to 110 are reserved for SNSC VMready Wizard.
Statistics	Enables or disables the statistics.
Filter Action	Sets the filter action to none, permit, deny or setprio (set priority).
Priority	Sets the priority to none or 0-7. Note that this field is enabled only when you set the Filter Action to setprio. Or else, none is taken by default.
Ethernet Format	Sets the Ethernet format to none, Ethernet2, SNAP or LLC.
Tag Format	Sets the tag format (disabled, any, none, or tagged).
IP Format	Sets the IP format (none, ipv4 or ipv6).

Table 365 Add VMAPs field descriptions

Field	Description
Source MAC address	Sets the source MAC address.
Source MAC Mask	Sets the source MAC mask.
Destination MAC Address	Sets the destination MAC address.
Destination MAC Mask	Sets the destination MAC mask.
Ethernet Type	Sets the Ethernet type to none, arp, ipv4, ipv6, mpls, rarp, any or other.
Ethernet Value	Sets the Ethernet value. Note that this field is enabled only when you set the Ethernet type to “other”.
802.1p Priority	Sets 802.1p priority to none or 0-7.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Type Of Service	Sets the Type Of Service.
Protocol	Sets the protocol.
Source Port	Sets the source port.
Source Port Mask	Sets the source port mask.
Destination Port	Sets the destination port.
Destination Port Mask	Sets the destination port mask.
Committed Rate	Sets the committed rate.
Maximum Burst Size	Sets the maximum burst size.
Port Metering Status	Enables or disables port metering.
Meter Action	Sets the meter action to unconfigured, outdrop or outpass.
In Profile Dscp Enable	Enables or disables in-profile DSCP.
In Profile Dscp Value	Sets the in-profile DSCP value.
Out Profile Dscp Enable	Enables or disables out-of-profile DSCP.
Out Profile Dscp Value	Sets the out-of-profile DSCP value.

Table 365 Add VMAPs field descriptions

Field	Description
User Priority	Sets the user priority.
ToS Precedence	Enables or disables TOS precedence.

Step 7.3: Deploy VMAP Configuration

To deploy VMAPs on all VMready switches, in the VMAP Configuration page, click **Deploy**. This launches the confirmation dialog for deploying the configuration. If you click **Yes**, it initiates configuration of VMAPs on all the VMready switches of that VMready configuration.

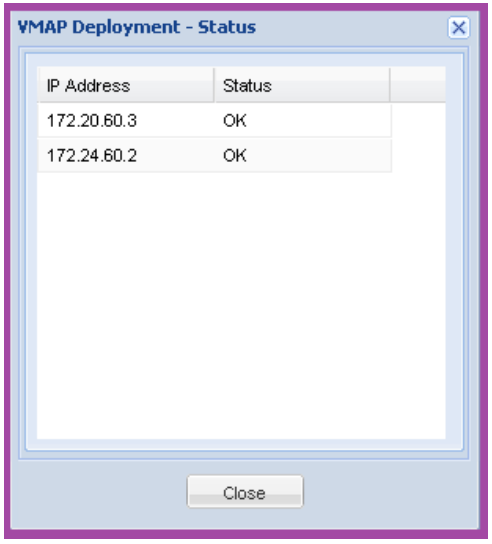
Note 1: Only those VMAPs that have their “Deployed” status set to `not yet` are deployed/configured.

Note 2: If a VMready switch is newly added, all the VMAPs are configured, regardless of their “Deployed on the Switch” setting.

Note 3: The messages associated with this deployment operation are logged in VMAP logs available from **Logs > VMready Deployment > VMready Across the DataCenter > VMAP Log**.

While the deployment operation is in progress, the wizard displays a progress bar and a log window of the deployment messages. After deployment is completed, a dialog appears that indicates the status of deployment (Ok, Failed, Device down) on each of the VMready switches. See Figure 81 on page 667.

Figure 81 VMAP Deployment Status



Step 8: Configure Server Ports

Note: This is an optional step intended for RackSwitches.

This page lists RackSwitches that are selected for the VMready configuration. It allows you to view and configure the Server Ports for the listed RackSwitches. See Figure 79 on page 662.

Figure 82 VMready Across the Datacenter—Configure Server Ports

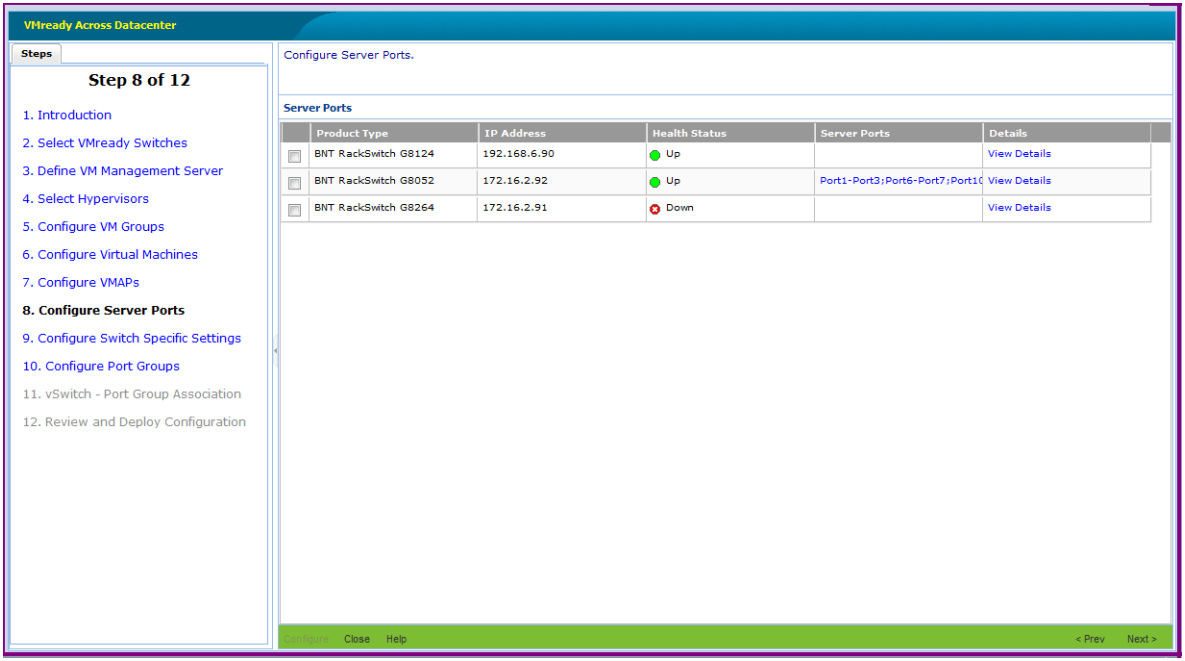


Table 366 Configure Server Ports field descriptions

Field	Description
Product Type	Displays the product description.
IP Address	IP address of the VMready switch.
Health Status	Health Status (Up, Non-Critical, Critical, or Down, depending on global health status of the switch).
Server Ports	Displays a list of configured server ports.
Details	Click **View Details** to display the list of configured server ports in a pop-up window.

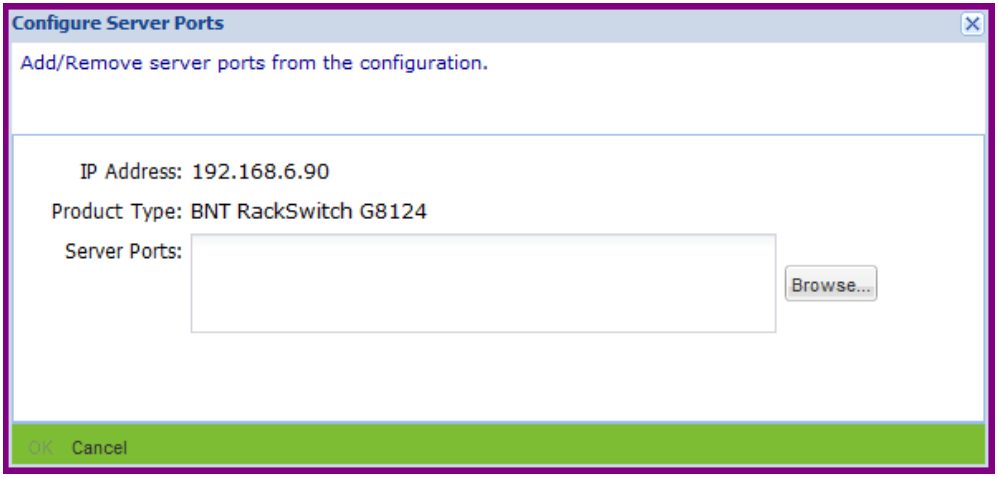
This step provides the following primary options:

Button	Description
Configure	Opens a window for configuring server ports for the selected RackSwitch.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration.
Prev	Moves to the previous step or page in the configuration.

Step 8.1: Configuring Server Ports

To configure the server ports for the selected switch, click **Configure**. This action launches a window that allows you to add or remove the server ports. See Figure 83 on page 670.

Figure 83 Configure Server Ports window



Note: Click **Browse...** to launch the port selection window, which lists the configured ports and the available ports. By check-boxing the rows, the selected entries can be added or removed.

Step 9: Configure Switch-Specific Settings

This step provides an option to configure settings such as Ports, LACP **admin key**, Trunk ID, and VMAPs on the VMready switches. See Figure 84 on page 671.

Note: This step is optional. Click **Next** to skip this step.

Figure 84 VMready Across the Datacenter—Configure Switch-Specific Settings

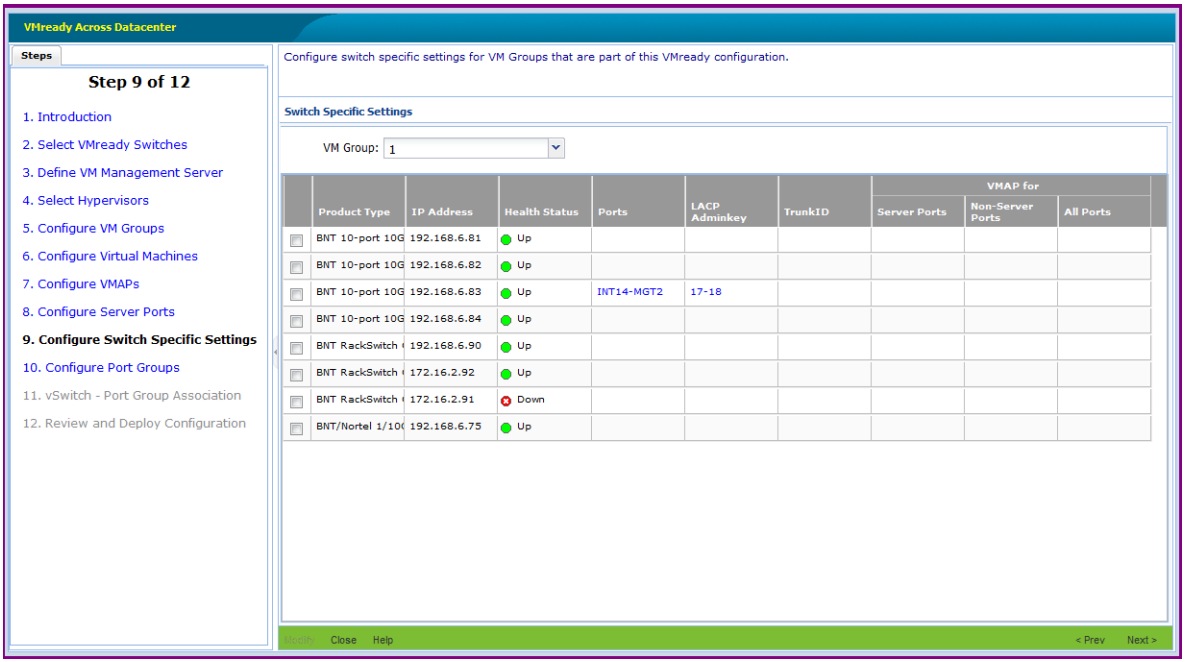


Table 367 Configure Switch-Specific Settings field descriptions

Field	Description
VM Group	VM Group drop-down list that displays the configured VM Groups. Selecting a VM Group shows the switch parameters that are specifically configured for that VM Group. **Note**: This field is not part of the table, but is available above the table.
Product Type	Switch type (for example, HP 1:10Gb Ethernet BL-c Switch).
IP Address	IP address of the VMready switch.
Health Status	Switch Health Status (Up or Down, depending on whether the switch is reachable or not).
Ports	The configured ports for that VM Group in a CSV format. An empty list indicates no configuration is present.

Table 367 Configure Switch-Specific Settings field descriptions

Field	Description
LACP Adminkey	The configured LACP **admin key** for that VM Group in CSV format. An empty list indicates no configuration is present.
Trunk ID	The configured Trunk IDs for the VM Group, in CSV format. An empty list indicates no configuration is present.
	VMAPs for
Server Ports	The configured VMAPs for Server (internal or downlink) ports.
Non-Server Ports	The configured VMAPs for Non-Server (external or uplink) ports.
All Ports	The configured VMAPs for Server and Non-Server ports.

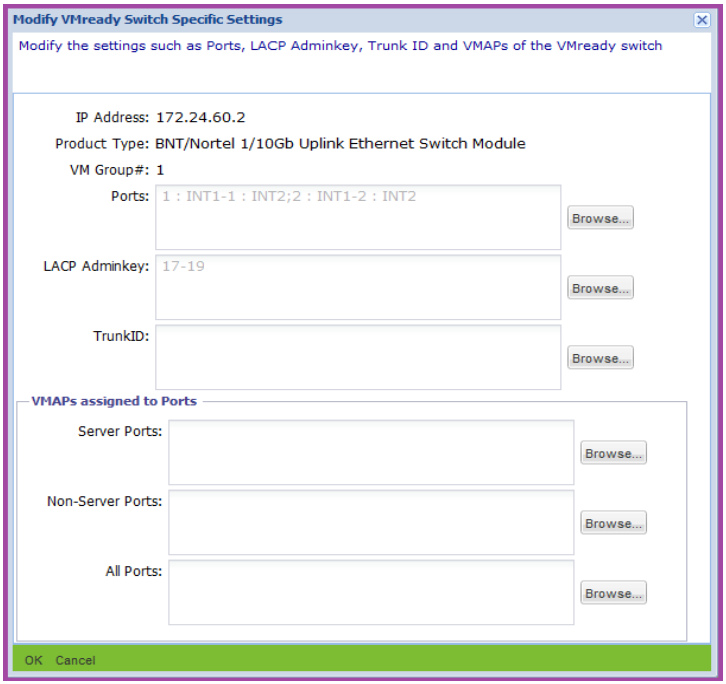
This step provides the following primary options:

Button	Description
Modify/View	Opens a child window enabling the user to see or edit the switch specific settings. **Note**: This button is enabled only when a row is selected.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration.
Prev	Moves to the previous step or page in the configuration.

Step 9.1: Modifying Switch-Specific Settings

To configure VMready switch specific settings for a VMready switch, first select VM Group and a VMready switch entry, then click **Modify** on the Switch Specific Settings page (step 7). This action launches a child window that allows you to edit the parameters. See Figure 85 on page 673.

Figure 85 Modify VMready Switch-Specific Settings

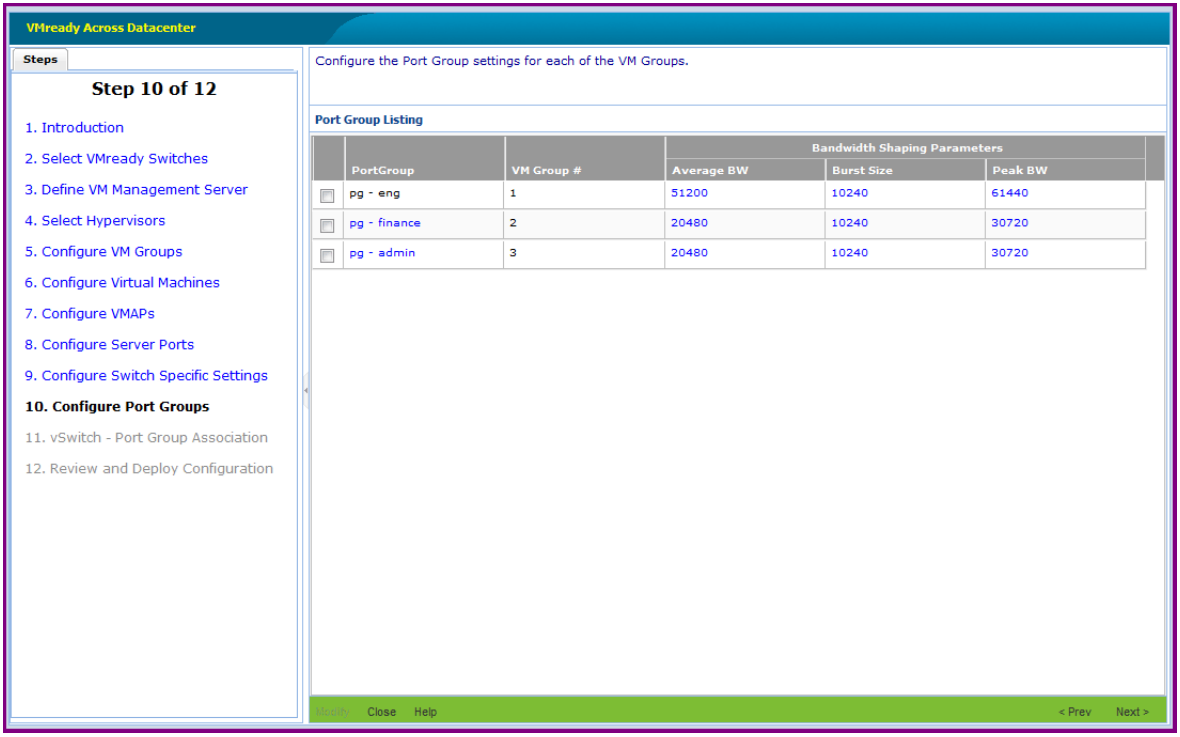


Step 10: Configure Port Groups

If VM Management Server is configured, when you click **Next** in the VMready Switch Specific Settings page, the Port Group Configuration screen is displayed. See Figure 86 on page 674.

Note: If VM Management Server is not configured in step 3, the wizard skips this step.

Figure 86 VMready Across the Datacenter—Configure Port Groups



The Port Group Listing table lists the rows corresponding to each of the configured VM groups along with the associated Port Group. Initially, the Port Group cells are blank.

Note: The **Next** button is enabled only if Port groups are associated to each VM group.

Table 368 Configure Port Groups field descriptions

Field	Description
Port Group	Port Group name.
VM Group #	VM Group associated with the Port Group.
	Bandwidth Shaping Parameters
Average BW	Average bandwidth, in Kilobits per second.
Burst Size	Maximum burst size, in Kilobytes.
Peak BW	Peak bandwidth, in Kilobits per second.

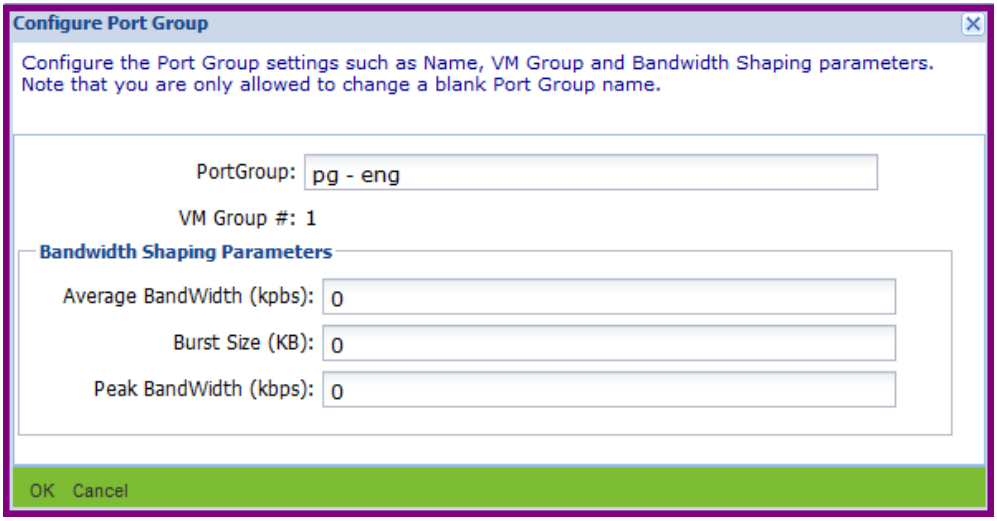
This step provides the following options:

Button	Description
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the **Next** button is disabled until you associate Port groups to each VM group.
Prev	Moves to the previous step or page in the configuration.

Step 10.1: Modify Port Group Settings

To configure Port Group settings for a VM Group, click **Modify** on the Port Groups page. This action launches a child window that allows you to edit the parameters. See Figure 87 on page 676.

Figure 87 Configure Port Group



Step 11: Associate Port Group to a vSwitch

This step allows you to configure Port Groups (defined in step 9) onto one vSwitch on each hypervisor (defined in step 4).

Note: If VM Management Server is not configured in step 3, the wizard skips this step.

Click **Next** in Port Groups to display the screen showing per Hypervisor based vSwitch association for each Port Group. Initially, the vSwitch column shows none, but you can assign a vSwitch using the drop-down list on double click. See Figure 88 on page 678.

Figure 88 VMready Across the Datacenter—vSwitch - Port Group Association

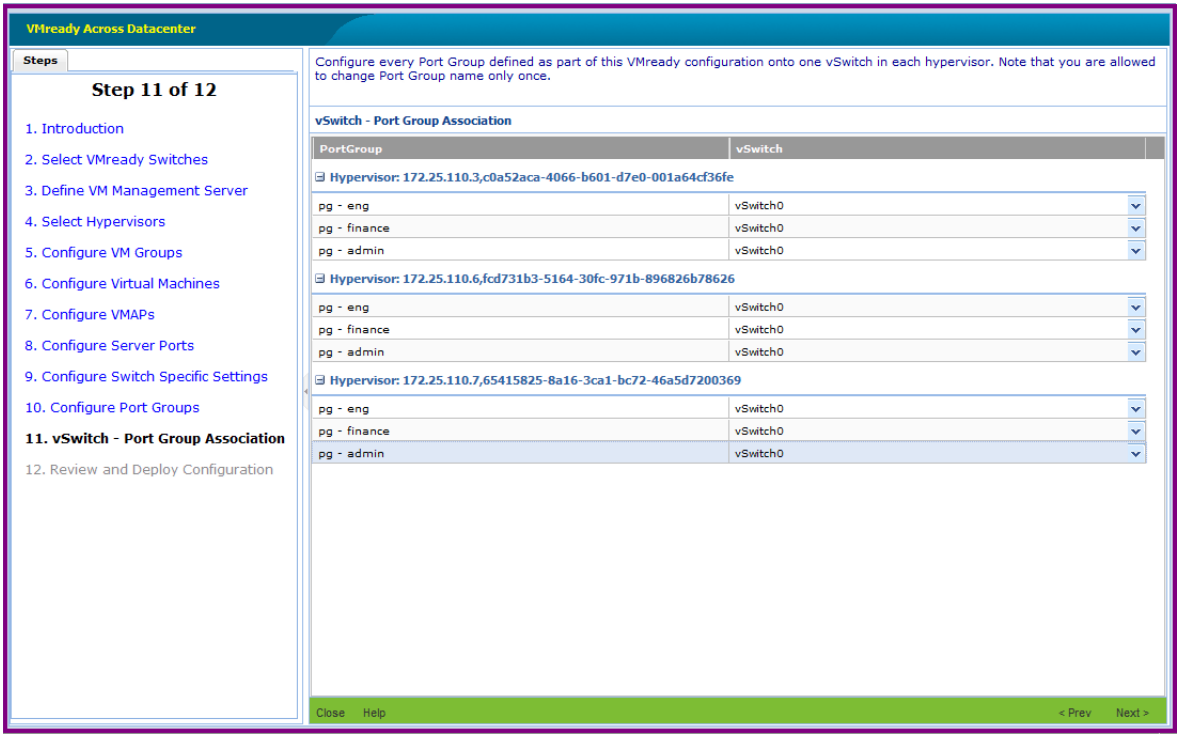


Table 369 vSwitch - Port Group Association field descriptions

Field	Description
Hypervisor	Hypervisor displayed in the following format: `Hypervisor: <Name>, <UUID>` **Note**: Hypervisor cell spans each entire row. Each Hypervisor row lists the Port Groups and the vSwitch of the Hypervisor with which it is associated.
Port Group	Port Group. For each Hypervisor, each Port Group configured is shown in a separate row.
vSwitch	vSwitch of the Hypervisor with which the Port Group is associated. This field contains a drop-down list, which lists all the vSwitches of that Hypervisor along with an additional ‘none’ option.

Note: Each Hypervisor added to the configuration is shown in a separate row. Below each Hypervisor row are the rows for each configured Port Group and the associated vSwitch. The Hypervisor row contains a button that can be used for hiding or showing the Port Group and vSwitch rows associated with that Hypervisor. The **Next** button is enabled only when every Port Group is associated with a Hypervisor vSwitch.

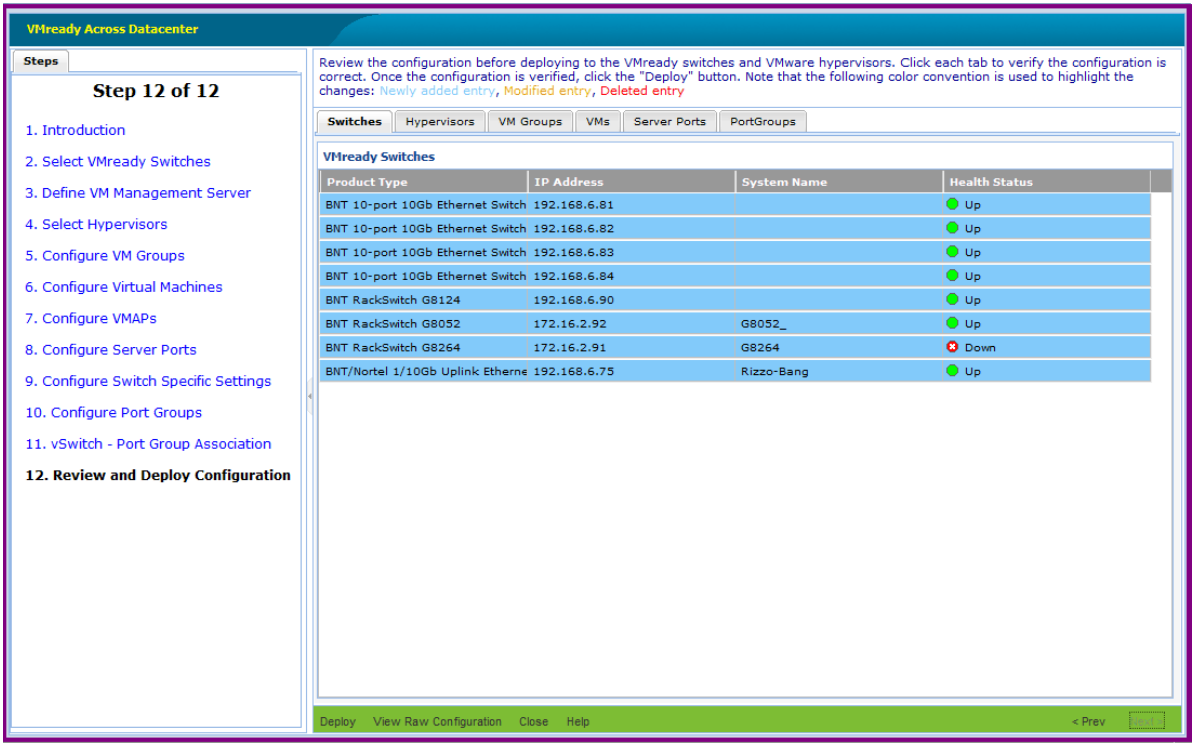
This step provides the following options:

Button	Description
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the **Next** button is disabled until you associate Port groups with a vSwitch.
Prev	Moves to the previous step or page in the configuration.

Step 12: Review and Deploy the Configuration

This step allows you to review the configuration. The reviewing page is a multi-tabbed pane and some of the tabs are present or absent depending on whether VM Management Server is configured. See Figure 89 on page 680.

Figure 89 VMready Across the Datacenter—Review Configuration



The following table provides a summary of the Review tabs.

Table 370 VMready Review tab descriptions

Tab	Description
Switches	Lists the configured VMready switches.
Hypervisors	Lists the configured Hypervisors. **Note**: This tab is present only when the VM Management Server is configured.
VM Groups	Lists the configured VMready switches and the VM Group specific Switch Settings.
VMs	Lists the configured Virtual Machines.

Table 370 VMready Review tab descriptions

Tab	Description
Server Ports	Lists the configured Server Ports for the RackSwitches.
Port Groups	Lists the configured Port Groups and the vSwitch – Port Group association.

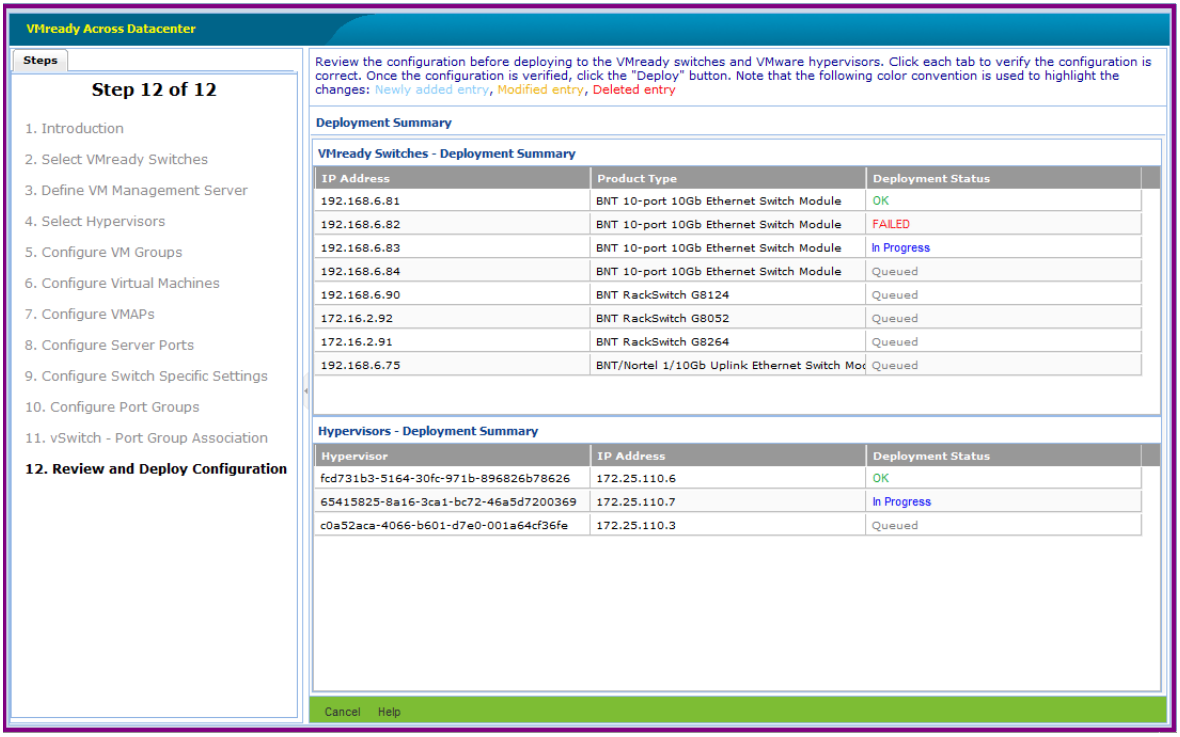
Step 12.1: Deploying the VMready Configuration

Once you have reviewed the configurations, click **Deploy** to display a confirmation dialog. Click **Ok** to initiate the deployment of the VMready configuration to the switches.

When you click **Ok**, the content frame displays a summary of the deployment across the configured VMready switches and Hypervisors (if VM Management Server is configured). See Figure 90 on page 682.

A log window shows the messages logged during deployment. You can view the logs at any time, as explained in “How to View Logs” on page 131.

Figure 90 VMready Across the Datacenter—Deployment Summary



Centralized VSI Database

Some IBM BLADE Switches, such as the *Virtual Fabric 10Gb Switch Module for IBM BladeCenter*, support the *pull* model for deploying 802.1Qbg configuration. The pull model enables those switches to get (or pull) the network configuration such as Virtual Switch Instance (VSI) type and 802.1Qbg parameters from a centralized repository using RESTfulAPI, whenever the switches detects new VMs added to Hypervisors connected to them.

You can configure Switch Center (SNSC) to host centralized VSI database repository, which exposes VSI DB resources through a RESTful API. The following topics describe the centralized VSI database:

VSI Database Overview

Figure 91 illustrates how Switch Center can serve as the centralized VSI database repository.

Figure 91 VSI database

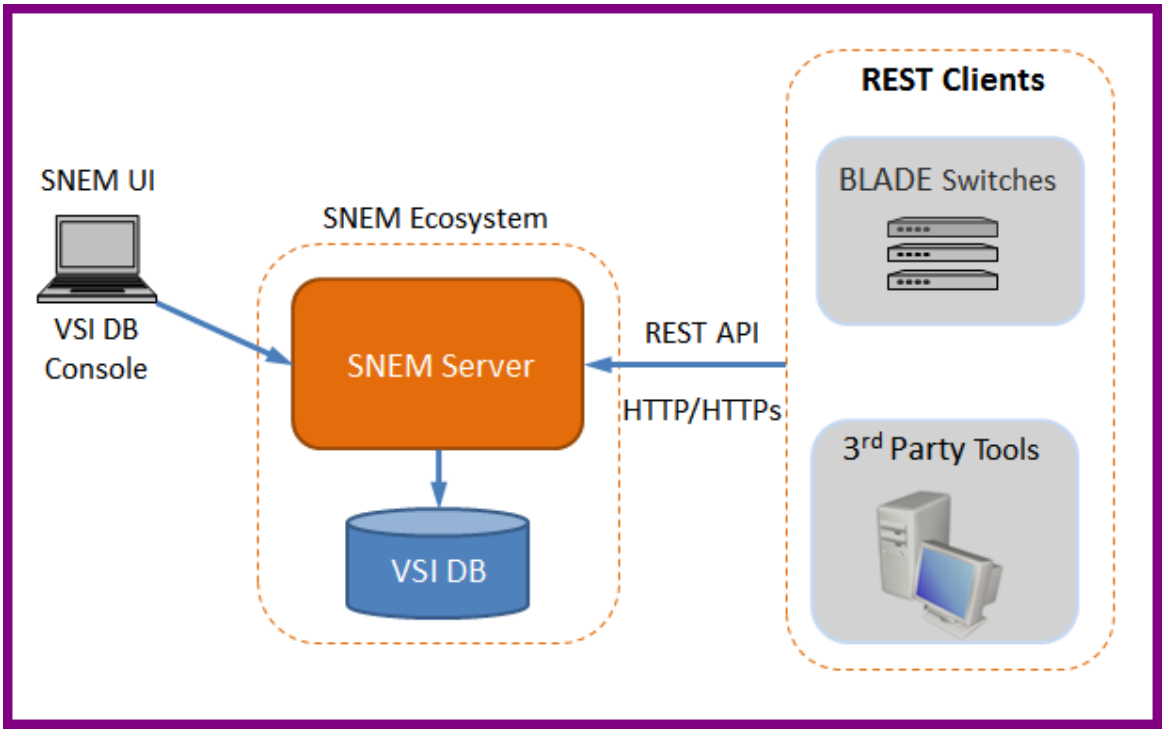


Figure 91 shows the VSI database structure, as follows:

- Switch Center Server hosts the VSI database.
- You can configure VSI database by launching VSI DB Console from Switch Center UI as an administrative privileged user. The VSI DB Console allows you to create, modify or delete VSI Type and 802.1Qbg specific parameters.
- You can also configure VSI database by utilizing RESTful API through any home-grown or 3rd party REST client (Note that Switch Center is not shipped with any REST clients).
- You can configure those IBM BLADE switches supporting REST clients with Switch Center address so that they can retrieve VSI Type and 802.1Qbg policies.

How to Configure VSI DB from the VSI DB Console

From the VSI DB Console, you can configure a VSI database using the following steps:

1. Create (configure) ACLs.
2. Create VSI Type by including ACLs that were created in step 1.

The following sections describe configuring VSI Type and 802.1Qbg parameters in VSI DB from the VSI DB Console:

- "VSI ACL Configuration" on page 686
- "VSI Type Configuration" on page 689

VSI ACL Configuration

You can insert, modify or delete ACLs, using the following steps (see Figure 92):

1. Login to Switch Center as an administrator privileged user.
2. Launch VSI DB Console by choosing menu **Virtualization Tools > VSI DB Console**.
3. Select ACL tab.

   You can add an ACL by clicking **Insert**.

   You can click **Modify** or **Delete** on an existing ACL.

Figure 92 VSI DB Console – ACL Configuration

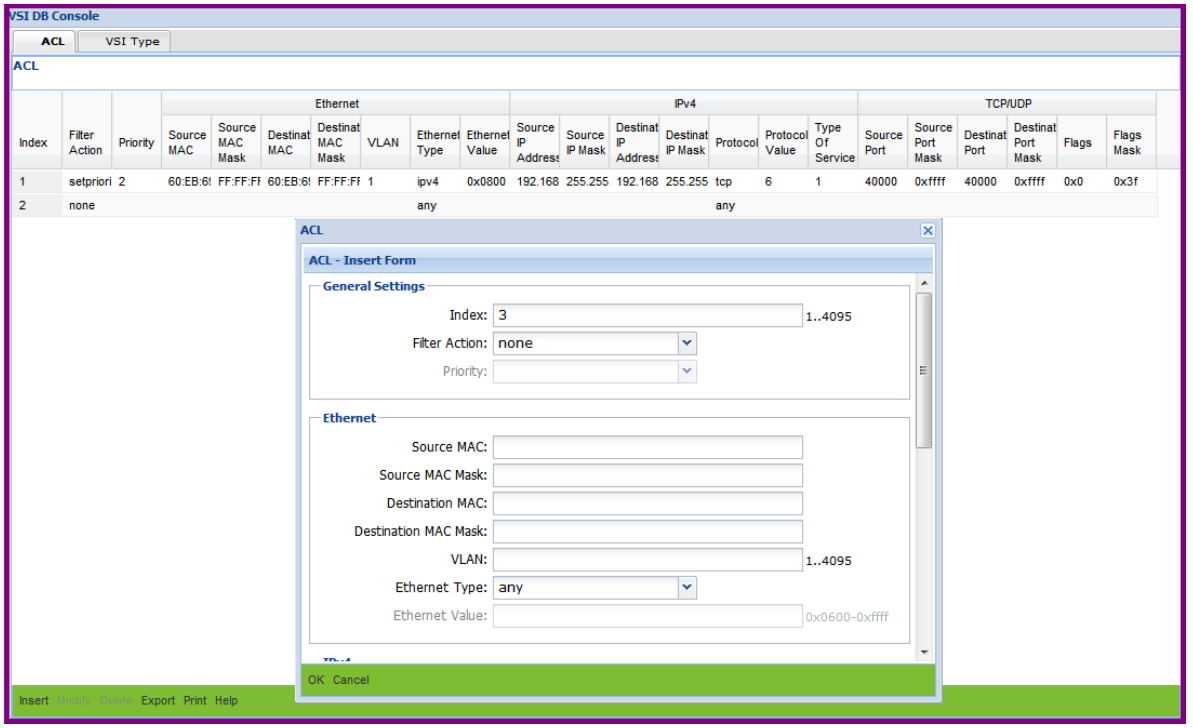


Table 371 VSI DB – ACL Configuration field descriptions

Field	Description
Index	The ACL index.
Filter ACtion	Sets the filter action as follows: `none, permit, deny, setprio`
Priority	Sets the priority in the range 0-7. Note that this field is enabled only when you set the Filter Action to `setprio`.
Source MAC	Sets the source MAC.
Source MAC Mask	Sets the source MAC mask.
Destination MAC	Sets the destination MAC.
Destination MAC Mask	Sets the destination MAC mask.
VLAN	Sets the VLAN number.
Ethernet Type	Sets the Ethernet type as follows: `any, arp, ipv4, ipv6, mpls, rarp, user-defined`

Table 371 VSI DB – ACL Configuration field descriptions

Field	Description
Ethernet Value	Sets the Ethernet value in the range 0x0600-0xffff. Note that this field can be used if you set the Ethernet Type to `user-defined.`
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Protocol	Sets the protocol type as follows: `any, tcp, udp, user-defined`
Protocol Value	Sets the protocol value in the range 1-255. Note that this field can be used if you set the Protocol to `user-defined.`
Type of Service	Sets the type of service in the range 0-255.
Source Port	Sets the source port in the range 1-65535.
Source Port Mask	Sets the source port mask in the range 0x0000-0xffff.
Destination Port	Sets the destination port in the range 1-65535.
Destination Port Mask	Sets the destination port mask in the range 0x0000-0xffff.
Flags	Sets the TCP flags in the range 0x0-0x3f. Note that this is enabled only when you set the Protocol to `tcp`.
Flags Mask	Sets the TCP flags mask in the range 0x0-0x3f. Note that this is enabled only when you set the Protocol to `tcp`.

VSI Type Configuration

You can insert, modify or delete VSI Types, using the following steps (see Figure 93):

1. Login to Switch Center as an administrator privileged user.
2. Launch VSI DB Console by choosing menu **Virtualization Tools > VSI DB Console**.
3. Select VSI Type tab.

   You can add a VSI Type by clicking **Insert**.

   You can click **Modify** or **Delete** on an existing VSI Type.

Figure 93 VSI DB Console – VSI Type Configuration

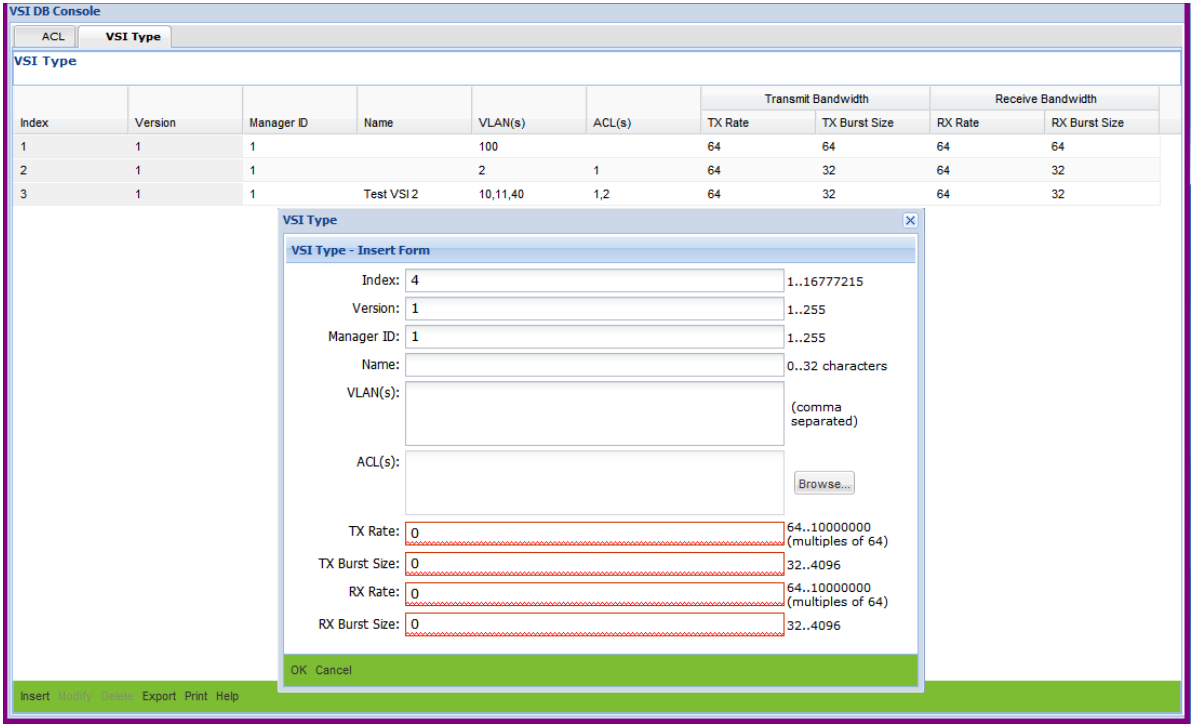


Table 372 VSI DB – VSI Type Configuration field descriptions

Field	Description
Index	VSI Type index (1-16777215).
Version	VSI Type version (1-255).

Table 372 VSI DB – VSI Type Configuration field descriptions

Field	Description
Manager ID	The manager ID (1-255) to which this VSI Type is associated.
Name	The VSI Type name (0-32).
VLAN(s)	The VLANs configured for this VSI Type.
ACL(s)	The ACLs configured for this VSI Type. Click **Browse…** to launch ACL selection window, which lists the configured ACLs.
TX Rate	Committed transmission rate (64-10000000 kbps). It must be a multiple of 64.
TX Burst Size	Maximum transmission burst size (32-4096 kilobits).
RX Rate	Committed receive rate (64-10000000 kbps). It must be a multiple of 64.
RX Burst Size	Maximum receive burst size (32-4096 kilobits).

How to Administer VSI Database Using RESTful APIs

Switch Center exposes RESTful APIs that can be used by those IBM BLADE switches supporting 802.1Qbg for deploying VSI Type configuration. You can also use these RESTful APIs to configure VSI DB in Switch Center.

The following HTTP/HTTPs methods are supported by RESTful APIs:

- GET – For retrieving VSI Types
- POST – For creating new VSI Types
- PUT – For updating an existing VSI Type
- DELETE – For deleting an existing VSI Type

This chapter covers the following topics:

VSI Types RESTful APIs

The following table provides the brief description of various RESTful APIs supported by Switch Center:

Table 373 RESTful APIs Supported by Switch Center

Resource URI	HTTP Method	Supported Protocol	Description
`/vsitypes/`	GET	HTTP, HTTPS	Returns a list of VSI Types associated with different versions.
`/vsitypes/{version}/`	GET	HTTP, HTTPS	Returns the list of VSI Types associated with the specified {version}.
`/vsitypes/{version}/{id}`	GET	HTTP, HTTPS	Returns the VSI Type created for {version} having the id as {id}.
`/vsitypes/{version}/{id}`	POST	HTTPS	Creates the VSI Type {id} for the version {version}.
`/vsitypes/{version}/{id}`	PUT	HTTPS	Modifies the VSI Type {id} created for the version {version}.
`/vsitypes/{version}/{id}`	DELETE	HTTPS	Deletes the VSI Type {id} created for the version {version}.

Note: The Resource URIs in the above table are listed in relative path. For example, `/vsitypes/`
maps to:
`http://`<*server*>`:40080/snsc/rest/vsitypes/`
or
`https://` <*server*>`:40443/snsc/rest/vsitypes/`

Where <*server*> is the IP address of the system on which Switch Center is installed.

Access Control for RESTful APIs

The RESTful APIs offered by Switch Center requires authentication for creation (POST), modification (SET) and deletion (DELETE) methods.

Switch Center uses Basic HTTP authentication, which requires the RESTful client to send the authentication information in the Authorization request header.

If you send a POST, PUT and DELETE request without proper authentication credential, Switch Center's RESTful service returns back a 401 response code (the challenge). The following snippet shows the challenge response send by Switch Center in case of a bad `authentication request:`

```
HTTP/1.1 401 Authorization Required
Server: HTTPd/1.0
Date: Thu, 14 Jul 2011 12:23:15 GMT
WWW-Authenticate: Basic realm="VSI Types"
```

Note: In addition to authentication, POST, SET and DELETE requests for VSI Types resources should be sent over HTTPs. If you use HTTP for sending POST, SET and DELETE operations, Switch Center's RESTful service returns the following error: `405 Method Not Allowed`

XML Schema for VSI Types

The following list shows the XML schema associated with RESTfulVSI Type Request and Response:

```
<?xml version="1.0"?>
<xs:schemaxmlns:xs="http://www.w3.org/2001/XMLSchema">
 <xs:element name="vsi-types">
  <xs:complexType>
   <xs:sequence>
    <xs:element ref="vsi-type" minOccurs="0" maxOccurs="unbounded"/>
   </xs:sequence>
   </xs:complexType>
 </xs:element>
 <xs:element name="vsi-type">
  <xs:complexType>
   <xs:sequence>
    <xs:element name="id" type="xs:string" minOccurs="1"
     maxOccurs="1"/>
    <xs:element name="version" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="managerid" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="name" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="vlanid" type="xs:string" minOccurs="1" maxOccurs="unbounded"/>
    <xs:element ref="bandwidth" minOccurs="1" maxOccurs="1"/>
    <xs:element ref="acl" minOccurs="0" maxOccurs="unbounded"/>
   </xs:sequence>
  </xs:complexType>
  </xs:element>
  <xs:element name="bandwidth">
   <xs:complexType>
    <xs:sequence>
     <xs:element ref="txrate" minOccurs="1" maxOccurs="1"/>
     <xs:element ref="rxrate" minOccurs="1" maxOccurs="1"/>
    </xs:sequence>
   </xs:complexType>
  </xs:element>
  <xs:element name="acl">
   <xs:complexType>
    <xs:sequence>
     <xs:element name="action" type="filterActionType" minOccurs="0"
        maxOccurs="1"/>
     <xs:element name="prio" type="priorityType" minOccurs="0" maxOccurs="1"/>
     <xs:element ref="ethernet" minOccurs="0" maxOccurs="1"/>
     <xs:element ref="ipv4" minOccurs="0" maxOccurs="1"/>
     <xs:element ref="tcpudp" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
   </xs:complexType>
  </xs:element>
```

```
<xs:element name="txrate">
 <xs:complexType>
  <xs:sequence>
   <xs:element name="txcommittedrate" type="xs:string" minOccurs="1"
      maxOccurs="1"/>
   <xs:element name="txburst" type="xs:string" minOccurs="1" maxOccurs="1"/>
  </xs:sequence>
 </xs:complexType>
</xs:element>
<xs:element name="rxrate">
 <xs:complexType>
  <xs:sequence>
   <xs:element name="rxcommittedrate" type="xs:string" minOccurs="1"
      maxOccurs="1"/>
   <xs:element name="rxburst" type="xs:string" minOccurs="1" maxOccurs="1"/>
  </xs:sequence>
 </xs:complexType>
</xs:element>
<xs:element name="ethernet">
 <xs:complexType>
  <xs:sequence>
   <xs:element name="smac" type="macAddressType" minOccurs="0" maxOccurs="1"/>
   <xs:element name="smacmask" type="macAddressType" minOccurs="0"
      maxOccurs="1"/>
   <xs:element name="dmac" type="macAddressType" minOccurs="0" maxOccurs="1"/>
   <xs:element name="dmacmask" type="macAddressType" minOccurs="0"
      maxOccurs="1"/>
   <xs:element name="vlan" type="xs:string" minOccurs="0" maxOccurs="1"/>
   <xs:element name="ethtype" type="xs:string" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
 </xs:complexType>
</xs:element>
<xs:element name="ipv4">
 <xs:complexType>
  <xs:sequence>
   <xs:element name="sip" type="ipAddressType" minOccurs="0" maxOccurs="1"/>
   <xs:element name="sipmask" type="ipAddressType" minOccurs="0"
      maxOccurs="1"/>
   <xs:element name="dip" type="ipAddressType" minOccurs="0" maxOccurs="1"/>
   <xs:element name="dipmask" type="ipAddressType" minOccurs="0"
      maxOccurs="1"/>
   <xs:element name="ipproto" type="xs:string" minOccurs="0" maxOccurs="1"/>
   <xs:element name="tos" type="xs:string" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
 </xs:complexType>
</xs:element>
<xs:element name="tcpudp">
 <xs:complexType>
  <xs:sequence>
```

```
     <xs:element name="sport" type="xs:string" minOccurs="0" maxOccurs="1"/>
     <xs:element name="sportmask" type="xs:string" minOccurs="0" maxOccurs="1"/>
     <xs:element name="dport" type="xs:string" minOccurs="0" maxOccurs="1"/>
     <xs:element name="dportmask" type="xs:string" minOccurs="0" maxOccurs="1"/>
     <xs:element name="flags" type="xs:string" minOccurs="0" maxOccurs="1"/>
     <xs:element name="flagsmask" type="xs:string" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
   </xs:complexType>
  </xs:element>

  <xs:simpleType name="filterActionType">
   <xs:restriction base="xs:string">
    <xs:pattern value="none|permit|deny|setpriority"/>
   </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="priorityType">
   <xs:restriction base="xs:string">
    <xs:pattern value="|0|1|2|3|4|5|6|7"/>
   </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="ipAddressType">
   <xs:restriction base="xs:string">
    <xs:pattern value="(([0-1])?[0-9]([0-9])?|2[0-4][0-9]|25[0-5])\.(([0-1])?[0-
9]([0-9])?|2[0-4]
[0-9]|25[0-5])\.(([0-1])?[0-9]([0-9])?|2[0-4][0-9]|25[0-5])\.(([0-1])?[0-9]([0-
9])?|2[0-4][0-9]|25[0-5])"/>
   </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="macAddressType">
   <xs:restriction base="xs:string">
    <xs:pattern value="[0-9a-fA-F]{2}(:[0-9a-fA-F]{2}){5}"/>
   </xs:restriction>
  </xs:simpleType>
</xs:schema>
```

VSI Types RESTful API Reference - Examples

The following sections provide usage references for the supported VSI DB RESTful APIs.

GET Request to Retrieve VSI Types Configured with a Specific Version

Resource URI	`http://<server>:40080/snsc/rest/vsitypes/{version}` (for HTTP) `https://<server>:40443/snsc/rest/vsitypes/{version}` (for HTTPs)
Method	HTTP GET
Supported Protocols	HTTP and HTTPS
Request Body	Not applicable
Returns	• `202 OK and XML data` (if data is available). • `404 Not Found` (if VSI Types are not available for specified version).

Example:
GET VSI Types configured for version 2 from Switch Center running on 192.168.1.1

`http://192.168.1.1:40080/snsc/rest/vsitypes/2` (for HTTP)
`https://192.168.1.1:40443/snsc/rest/vsitypes/2` (for HTTPs)

Response Template:

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
 <vsi-type>
  <id>10</id>
  <version>2</version>
  <managerid>1</managerid>
  <name>VSI 1</name>
  <vlanid>11</vlanid>
  <vlanid>12</vlanid>
  <vlanid>13</vlanid>
  <vlanid>14</vlanid>
  <bandwidth>
   <txrate>
    <txcommittedrate>64</txcommittedrate>
    <txburst>32</txburst>
   </txrate>
   <rxrate>
    <rxcommittedrate>64</rxcommittedrate>
    <rxburst>32</rxburst>
   </rxrate>
  </bandwidth>
```

```
<acl>
 <action>setpriority</action>
 <prio>1</prio>
 <ethernet>
  <smac>A1:BC:33:44:55:D6</smac>
  <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
  <dmac>A2:DD:33:44:55:E7</dmac>
  <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
  <vlan>12</vlan>
  <ethtype>0x0800</ethtype>
 </ethernet>
 <ipv4>
  <sip>192.168.6.1</sip>
  <sipmask>255.255.255.0</sipmask>
  <dip>192.168.6.2</dip>
  <dipmask>255.255.255.0</dipmask>
  <ipproto>6</ipproto>
  <tos>0</tos>
 </ipv4>
 <tcpudp>
  <sport>1</sport>
  <sportmask>0xffff</sportmask>
  <dport>3</dport>
  <dportmask>0xffff</dportmask>
  <flags>0x0</flags>
  <flagsmask>0x1</flagsmask>
 </tcpudp>
 </acl>
</vsi-type>
<vsi-type>
<id>11</id>
<version>2</version>
<managerid>1</managerid>
<name>VSI 1</name>
<vlanid>20</vlanid>
<bandwidth>
 <txrate>
  <txcommittedrate>128</txcommittedrate>
  <txburst>32</txburst>
 </txrate>
 <rxrate>
```

```
      <rxcommittedrate>128</rxcommittedrate>
      <rxburst>32</rxburst>
     </rxrate>
    </bandwidth>
    <acl>
     <action>setpriority</action>
     <prio>1</prio>
     <ethernet>
      <smac>B1:BC:33:44:55:D6</smac>
      <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
      <dmac>B2:DD:33:44:55:E7</dmac>
      <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
      <vlan>22</vlan>
      <ethtype>0x0800</ethtype>
     </ethernet>
     <ipv4>
      <sip>192.168.6.1</sip>
      <sipmask>255.255.255.0</sipmask>
      <dip>192.168.6.2</dip>
      <dipmask>255.255.255.0</dipmask>
      <ipproto>6</ipproto>
      <tos>0</tos>
     </ipv4>
     <tcpudp>
      <sport>1</sport>
      <sportmask>0xffff</sportmask>
      <dport>3</dport>
      <dportmask>0xffff</dportmask>
      <flags>0x0</flags>
      <flagsmask>0x1</flagsmask>
     </tcpudp>
    </acl>
   </vsi-type>
  </vsi-types>
```

GET Request to Retrieve an Individual VSI Type

Resource URI	`http://<server>:40080/snsc/rest/vsitypes/{version}/{id}` (for HTTP) `https://<server>:40443/snsc/rest/vsitypes/{version}/{id}` (for HTTPs)
Method	HTTP GET
Supported Protocols	HTTP and HTTPS
Request Body	Not applicable
Returns	• `202 OK and XML data` (if data is available). • `404 Not Found` (if VSI Types are not available for specified version).

Example:
GET an individual VSI Type 2 configured for version 1 from Switch Center running on 192.168.1.1

`http://192.168.1.1:40080/snsc/rest/vsitypes/1/2` (for HTTP)
`https://192.168.1.1:40443/snsc/rest/vsitypes/1/2` (for HTTPs)

Response Template:

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
 <vsi-type>
  <id>2</id>
  <version>1</version>
  <managerid>1</managerid>
  <name>VSI 1</name>
  <vlanid>1</vlanid>
  <vlanid>2</vlanid>
  <vlanid>3</vlanid>
  <vlanid>4</vlanid>
  <bandwidth>
  <txrate>
   <txcommittedrate>64</txcommittedrate>
   <txburst>32</txburst>
  </txrate>
  <rxrate>
   <rxcommittedrate>64</rxcommittedrate>
   <rxburst>32</rxburst>
  </rxrate>
  </bandwidth>
  <acl>
```

```
    <action>setpriority</action>
    <prio>1</prio>
    <ethernet>
     <smac>11:22:33:44:55:66</smac>
     <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
     <dmac>11:22:33:44:55:56</dmac>
     <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
     <vlan>2</vlan>
     <ethtype>0x0800</ethtype>
    </ethernet>
    <ipv4>
     <sip>192.168.6.1</sip>
     <sipmask>255.255.255.0</sipmask>
     <dip>192.168.6.2</dip>
     <dipmask>255.255.255.0</dipmask>
     <ipproto>6</ipproto>
     <tos>0</tos>
    </ipv4>
    <tcpudp>
     <sport>1</sport>
     <sportmask>0xffff</sportmask>
     <dport>3</dport>
     <dportmask>0xffff</dportmask>
     <flags>0x0</flags>
     <flagsmask>0x1</flagsmask>
    </tcpudp>
   </acl>
  </vsi-type>
</vsi-types>
```

GET Request to Retrieve All Configured VSI Types

Resource URI	`http://<server>:40080/snsc/rest/vsitypes` (for HTTP) `https://<server>:40443/snsc/rest/vsitypes` (for HTTPs)
Method	HTTP GET
Supported Protocols	HTTP and HTTPS
Request Body	Not applicable
Returns	• `202 OK and XML data` (if data is available). • `404 Not Found` (if VSI Types are not available for specified version).

Example:
GET all configured Types from Switch Center running on 192.168.1.1

`http://192.168.1.1:40080/snsc/rest/vsitypes` (for HTTP)
`https://192.168.1.1:40443/snsc/rest/vsitypes` (for HTTPs)

Response Template:

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
 <vsi-type>
  <id>2</id>
  <version>1</version>
  <managerid>1</managerid>
  <name>VSI 1</name>
  <vlanid>1</vlanid>
  <vlanid>2</vlanid>
  <vlanid>3</vlanid>
  <vlanid>4</vlanid>
  <bandwidth>
   <txrate>
    <txcommittedrate>64</txcommittedrate>
    <txburst>32</txburst>
   </txrate>
   <rxrate>
    <rxcommittedrate>64</rxcommittedrate>
    <rxburst>32</rxburst>
   </rxrate>
  </bandwidth>
  <acl>
   <action>setpriority</action>
```

```
 <prio>1</prio>
 <ethernet>
  <smac>11:22:33:44:55:66</smac>
  <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
  <dmac>11:22:33:44:55:56</dmac>
  <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
  <vlan>2</vlan>
  <ethtype>0x0800</ethtype>
 </ethernet>
 <ipv4>
  <sip>192.168.6.1</sip>
  <sipmask>255.255.255.0</sipmask>
  <dip>192.168.6.2</dip>
  <dipmask>255.255.255.0</dipmask>
  <ipproto>6</ipproto>
  <tos>0</tos>
 </ipv4>
 <tcpudp>
  <sport>1</sport>
  <sportmask>0xffff</sportmask>
  <dport>3</dport>
  <dportmask>0xffff</dportmask>
  <flags>0x0</flags>
  <flagsmask>0x1</flagsmask>
 </tcpudp>
 </acl>
</vsi-type>
<vsi-type>
<id>10</id>
<version>2</version>
<managerid>1</managerid>
<name>VSI 1</name>
<vlanid>11</vlanid>
<vlanid>12</vlanid>
<vlanid>13</vlanid>
<vlanid>14</vlanid>
<bandwidth>
 <txrate>
  <txcommittedrate>64</txcommittedrate>
  <txburst>32</txburst>
 </txrate>
```

```
  <rxrate>
   <rxcommittedrate>64</rxcommittedrate>
   <rxburst>32</rxburst>
  </rxrate>
 </bandwidth>
 <acl>
  <action>setpriority</action>
  <prio>1</prio>
  <ethernet>
   <smac>A1:BC:33:44:55:D6</smac>
   <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
   <dmac>A2:DD:33:44:55:E7</dmac>
   <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
   <vlan>12</vlan>
   <ethtype>0x0800</ethtype>
  </ethernet>
  <ipv4>
   <sip>192.168.6.1</sip>
   <sipmask>255.255.255.0</sipmask>
   <dip>192.168.6.2</dip>
   <dipmask>255.255.255.0</dipmask>
   <ipproto>6</ipproto>
   <tos>0</tos>
  </ipv4>
  <tcpudp>
   <sport>1</sport>
   <sportmask>0xffff</sportmask>
   <dport>3</dport>
   <dportmask>0xffff</dportmask>
   <flags>0x0</flags>
   <flagsmask>0x1</flagsmask>
  </tcpudp>
 </acl>
</vsi-type>
<vsi-type>
 <id>11</id>
 <version>2</version>
 <managerid>1</managerid>
 <name>VSI 1</name>
 <vlanid>20</vlanid>
 <bandwidth>
```

```
    <txrate>
     <txcommittedrate>128</txcommittedrate>
     <txburst>32</txburst>
    </txrate>
    <rxrate>
     <rxcommittedrate>128</rxcommittedrate>
     <rxburst>32</rxburst>
    </rxrate>
   </bandwidth>
   <acl>
    <action>setpriority</action>
    <prio>1</prio>
    <ethernet>
     <smac>B1:BC:33:44:55:D6</smac>
     <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
     <dmac>B2:DD:33:44:55:E7</dmac>
     <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
     <vlan>22</vlan>
     <ethtype>0x0800</ethtype>
    </ethernet>
    <ipv4>
     <sip>192.168.6.1</sip>
     <sipmask>255.255.255.0</sipmask>
     <dip>192.168.6.2</dip>
     <dipmask>255.255.255.0</dipmask>
     <ipproto>6</ipproto>
     <tos>0</tos>
    </ipv4>
    <tcpudp>
     <sport>1</sport>
     <sportmask>0xffff</sportmask>
     <dport>3</dport>
     <dportmask>0xffff</dportmask>
     <flags>0x0</flags>
     <flagsmask>0x1</flagsmask>
    </tcpudp>
   </acl>
  </vsi-type>
 </vsi-types>
```

POST Request to Create a VSI Type

Resource URI	`https://<server>:40443/snsc/rest/vsitypes/{version}/{id}`
Method	HTTP POST
Supported Protocols	HTTPS
Request Body	XML (see the Request Template below)
Returns	• `201 Created & Location` (returns header containing the URL of the newly created VSI Type). • `401 Unauthorized` (if authentication/authorization fails). • `405 Method Not Supported` (if the request is sent over HTTP). • `415 Unsupported Media Type` (if incorrect XML configuration is sent).

Example:
Create (POST) VSI Type 2 for version 1 from Switch Center running on 192.168.1.1

```
https://192.168.1.1:40443/snsc/rest/vsitypes/1/2
```

Request Template:

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
 <vsi-type>
  <id>2</id>
  <version>1</version>
  <managerid>1</managerid>
  <name>VSI 1</name>
  <vlanid>1</vlanid>
  <vlanid>2</vlanid>
  <vlanid>3</vlanid>
  <vlanid>4</vlanid>
  <bandwidth>
   <txrate>
    <txcommittedrate>64</txcommittedrate>
    <txburst>32</txburst>
   </txrate>
   <rxrate>
    <rxcommittedrate>64</rxcommittedrate>
    <rxburst>32</rxburst>
   </rxrate>
  </bandwidth>
```

```
  <acl>
   <action>setpriority</action>
   <prio>1</prio>
   <ethernet>
    <smac>11:22:33:44:55:66</smac>
    <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
    <dmac>11:22:33:44:55:56</dmac>
    <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
    <vlan>2</vlan>
    <ethtype>0x0800</ethtype>
   </ethernet>
   <ipv4>
    <sip>192.168.6.1</sip>
    <sipmask>255.255.255.0</sipmask>
    <dip>192.168.6.2</dip>
    <dipmask>255.255.255.0</dipmask>
    <ipproto>6</ipproto>
    <tos>0</tos>
   </ipv4>
   <tcpudp>
    <sport>1</sport>
    <sportmask>0xffff</sportmask>
    <dport>3</dport>
    <dportmask>0xffff</dportmask>
    <flags>0x0</flags>
    <flagsmask>0x1</flagsmask>
   </tcpudp>
  </acl>
 </vsi-type>
</vsi-types>
```

PUT Request to Modify an Existing VSI Type

Resource URI	`https://<server>:40443/snsc/rest/vsitypes/{version}/{id}`
Method	HTTP PUT
Supported Protocols	HTTPS
Request Body	XML (see the Request Template below)
Returns	• `201 Created & Location` (returns header containing the URL of the newly created VSI Type). • `401 Unauthorized` (if authentication/authorization fails). • `404 Not Found` (if specified VSI Type is not configured). • `405 Method Not Supported` (if the request is sent over HTTP). • `415 Unsupported Media Type` (if incorrect XML configuration is sent).

Example:
Update (PUT) few parameters of VSI Type 2 for version 1 in Switch Center running on 192.168.1.1

```
https://192.168.1.1:40443/snsc/rest/vsitypes/1/2
```

Request Template:

Note: Only those parameters that need to be modified can be included in XML body.

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
 <vsi-type>
  <id>2</id>
  <version>1</version>
  <managerid>1</managerid>
  <name>VSI NEW NAME 1</name>
  <bandwidth>
   <txrate>
    <txcommittedrate>128</txcommittedrate>
    <txburst>64</txburst>
   </txrate>
   <rxrate>
    <rxcommittedrate>128</rxcommittedrate>
    <rxburst>64</rxburst>
   </rxrate>
  </bandwidth>
 </vsi-type>
</vsi-types>
```

DELETE Request to Delete an Existing VSI Type

Resource URI	`https://<server>:40443/snsc/rest/vsitypes/{version}/{id}`
Method	HTTP DELETE
Supported Protocols	HTTPS
Request Body	Not applicable
Returns	• `204 No Content` (if successful, with no content in the response object). • `401 Unauthorized` (if authentication/authorization fails). • `404 Not Found` (if specified VSI Type is not configured). • `405 Method Not Supported` (if the request is sent over HTTP).

Example:
Delete VSI Type 2 for version 1 from Switch Center running on 192.168.1.1

```
https://192.168.1.1:40443/snsc/rest/vsitypes/1/2
```

Performing Device-Specific Actions

Switch Center (SNSC) allows you to perform specific actions per switch including synchronizing the configuration, launching telnet and web interfaces and invoking the global `apply`, `save` and `diff` commands.

The topics in this chapter cover the following main switch configuration features:

Synchronizing the Configuration - Sync Config

The Sync Config feature gives you the option to replicate certain configuration such as VLAN and Port settings from one switch to multiple switches at the same time.

Restrictions:

- You can only copy data to and from switches that have a health status of Up.
- You can only use the Sync Config feature if previously-made configuration changes are saved to switch flash.

To launch Sync Config page:

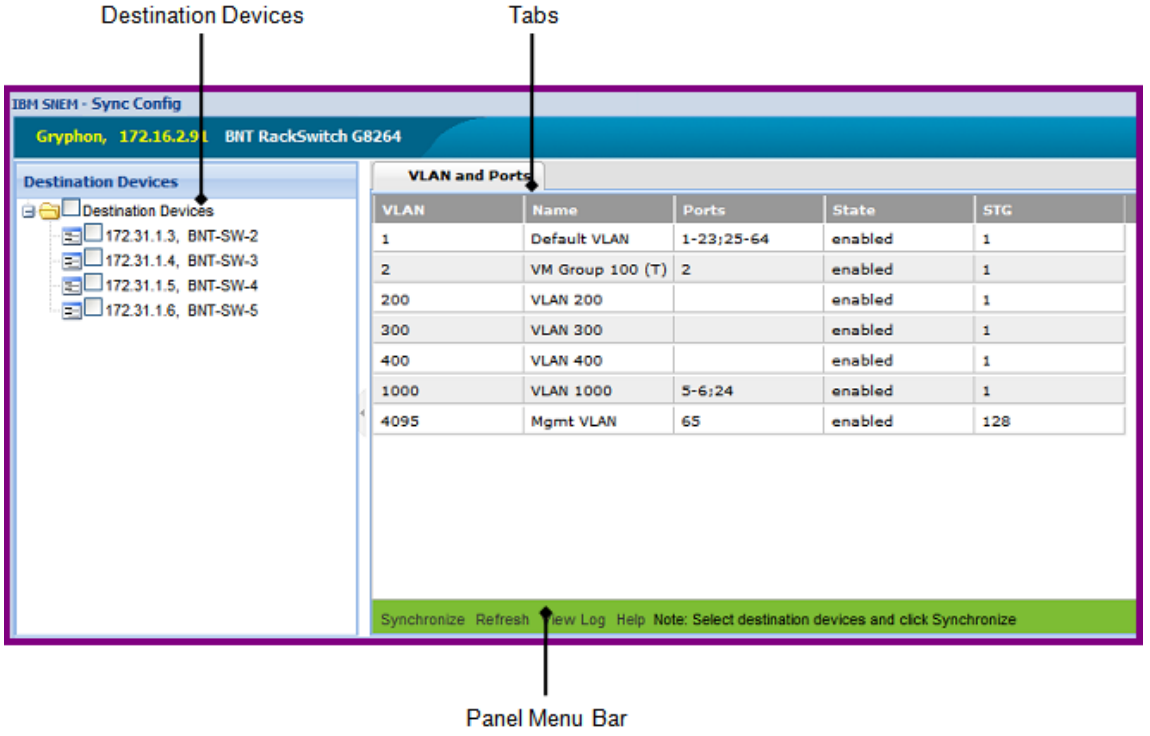
1 Select a switch in the device list (see Figure 6 on page 63).

2 Choose **Device > Sync Config** menu.

The Sync Config page (see Figure 94 on page 713) consists of two framed windows: the Destination Devices frame (left) and the Content frame (right).

The Destination Devices frame lists the discovered switches with type matching with the selected target switch for which the Sync Config operation can be performed. By default, the destination devices are deselected. The Content frame shows the sub-features in the form of tabs and the corresponding details in a panel along with panel specific menu bar at the bottom.

Figure 94 Sync Config Page



This section covers the following Sync Config topics:

- "VLAN and Port Synchronization" on page 714

VLAN and Port Synchronization

You can synchronize the following parameters from the selected source switch to the chosen set of destination switches:

- VLAN tag state
- VLAN table
- Default VLAN
- Management VLAN
- PVID

Restrictions:

- You can only synchronize data to and from switches that have a health status of Up and are of the same type.
- This operation will not be attempted on switches if previously-made configuration changes are not yet saved to switch flash. That is, it will not synchronize the configuration to switches that are in the “save pending” state.
- This feature is not supported on stacked switches.

Notes:

- If Sync operation fails on a device, Switch Center reverts any Sync Config changes done on that device.
- Since Sync Config changes the VLAN and Port information on target switches, there are chances of upsetting the network configuration, if the target switch is in live network. So, care should be taken. Having said so, Sync Config is best suited for those switches having factory default configuration.

You can launch VLAN and Port Synchronization page using the below steps:

1. Select the switch that has the VLAN and Port configuration that you want to replicate on other devices.
2. Choose menu **Device > Sync Config** and click VLAN and Ports feature.
3. From the Select Devices list, select/deselect the switches in the Select Devices list.
4. Click **Synchronize**.
5. Click **Yes** to confirm that you want to synchronize the devices, or click **No** to cancel synchronization.
6. Click **View Log** to see the status of the Sync Config process.

The following table describes the fields of the **VLAN and Ports** synchronization tab.

Table 374 Sync Config VLAN and Ports field descriptions

Field	Description
VLAN	The VLAN Id configured on the source switch
Name	VLAN name
Ports	Ports associated with the VLAN Id
State	Enabled/Disabled state
STG	Associated Spanning Tree Protocol Group

Global Actions

The global actions feature allows you to invoke switch specific global commands. These commands are mainly used for rebooting the switch, applying and saving the changes to the configuration, viewing the diff and reversing the configuration changes.

You can invoke these commands per-switch by using one of the following options:

- Select the switch and choose one of the items in **Device > Actions** menu.
- From the Device Console window, choose one of the items in **Actions** menu.

The following table lists the actions menus and the corresponding actions initiated on the switch:

Table 375 Actions menus

Action	Description
Apply	Applies any changes that you have made to the switch configuration
Save	Saves the current configuration to the flash memory.
Diff Config	Opens a window to display any pending configuration changes
Diff Flash	Opens a window to display any pending configuration changes and the affected configuration stored in flash memory on the switch.
Config Dump	Opens a window to display a dump of the current switch configuration.
Syslog Dump	Opens a window to display the syslogs available on the switch.
Revert	Reverts the switch to the current active configuration. This command is available if you did not apply the new configuration settings.
Revert Apply	Reverts the switch to the current saved configuration. This is available if you applied but did not save the new configuration settings.
Reboot Switch	Reboots the switch by reloads and saving the current RAM memory.
Delete	Deletes the switch entry from SNSC device list. **Note:** This option is not available in the Device Console window.

Launching Device Access Utilities

You can launch access utilities such as CLI interface or Web interface using this facility.

This section covers the following launch topics:

Launching CLI Interface

This feature allows you to launch a Telnet or SSH session to the switch. For example, you might use this feature to configure SNMP settings on a switch before you perform the discovery procedure. Before you can use this feature, you must know the administrator password to log in to the switch.

Note: This feature uses the local Telnet/SSH application to launch CLI session to the switch and hence, you must configure the browser appropriately.

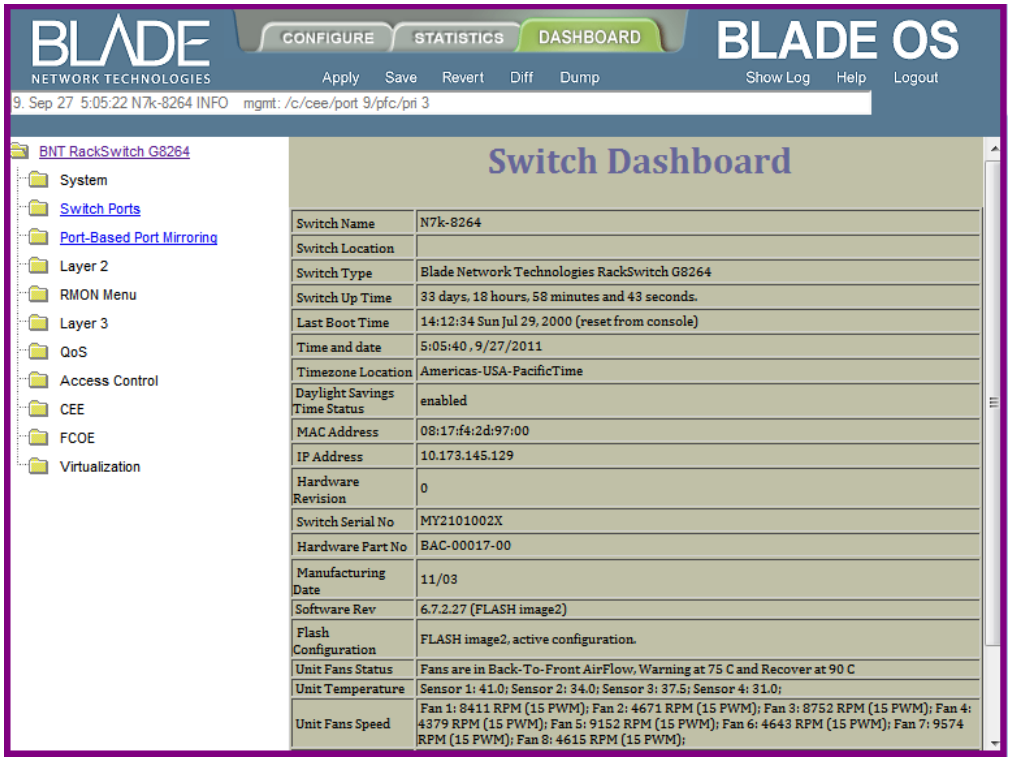
1. Select a switch.
2. Choose menu **Device > Launch > Console**. Switch Center launches the local application to open up CLI session (Telnet/SSH based).

Launching Web Interface

This feature allows you to launch a web (Browser Based Interface, or BBI) session to the switch. For example, you might use this feature to configure SNMP settings on a switch before you perform the discovery procedure.

1. Select a switch.
2. Choose menu **Device > Launch > Web > HTTP or Device > Launch > Web > HTTPs** to launch HTTP or HTTPs based Web UI respectively. Switch Center launches a BBI window in a new browser page (see Figure 95 on page 719).

Figure 95 BBI window



Maintenance

Use the maintenance facility to backup Switch Center's critical data. You can also take a runtime snap shot that would help the developers to debug issues noticed with Switch Center (SNSC).

The topics in this chapter cover the following maintenance features:

Taking Switch Center's Critical Data Backup

The critical data needed for running Switch Center spans across the following areas:

- Configuration Files
- Database

Configuration Files:

The configuration files can be further classified in to two groups namely, static data and dynamic data.

- Static Data – The data, which is not changed by Switch Center during the course of operation. It primarily consists of mapping and rules files.
- Dynamic Data – The data that changes when Switch Center is in operation.

The configuration files reside in conf directory under *<SNSC INSTALLATION>* location.

Database:

The database stores the user credentials, device data including monitoring and performance parameters. For Switch Center's day-to-day device administration/ monitoring operation, the data stored in the DB is very critical.

The database including purged data resides in database directory under *<SNSC INSTALLATION>* location.

In addition to the above mentioned critical data, the log messages play an important role in finding the status of the operation.

When Switch Center backs up the critical data, it includes conf, database and logs directories.

The backup operation involves in the following steps:

- "Setting Backup Directory on IBM System Networking Switch Center Server" on page 723
- "Initiating Critical Data Backup" on page 724

Setting Backup Directory on IBM System Networking Switch Center Server

Switch Center stores the back up in the user specified repository/directory residing or mounted on the system where Switch Center is installed. You can specify the directory for storing the backup operation using the following steps:

Note: This facility is available only to those users logged in as an administrator (if the Root user is disabled), or to those users who know root password (if the Root user is enabled).

1. Choose **Maintenance > Data Backup > Set Data Backup Directory** to launch the window for specifying the backup directory.
2. Specify the directory where to save.
3. If the Root user is enabled, enter the root password in the Root Password field (this field is not visible if the Root user is disabled).
4. Click **Set**.

Initiating Critical Data Backup

Any user can initiate critical data backup provided the backup directory is set. You can initiate critical data backup using the following steps:

1. Choose **Maintenance > Data Backup > Take Data Backup** to launch the data backup window. This window shows data backup file path.
2. Click **OK**.

Switch Center uses the standard ZIP format to compress the contents in backup file. The backup file is named as follows:
`SNSC_<version>_<date>_<time>.zip`

Where:

<*version*> is the Switch Center version in a.b.c.d format.

<*date*> is the date on the Switch Center server system in yyyymmdd format, on which the backup operation was initiated.

<*time*> is the time on the Switch Center server system in HHMMSS format, at which the backup operation was initiated.

For example, if the backup operation is initiated in Switch Center 5.2.1.0 on 23rd July 2010 at 14:01:43 hours, the backup file is named as:
`SNSC.2.1.0_20100723_140143.zip`

Note: While data backup is in progress, the database-related operations are queued until the backup operation, which might take from few seconds to couple of minutes depending on the database size, is completed.

Restoring the Data from the Critical Data Backup

You can restore the backed up data on any other Switch Center installation, provided you are restoring the data for same version of Switch Center:

- “Restoring the Data for IBM System Networking Switch Center Installed on a Linux System” on page 726

Restoring the Data for IBM System Networking Switch Center Installed on a Linux System

1. Log in as root on the Linux system installed with Switch Center, where you want to restore the data.
2. Stop SNSC services by issuing the following command:

   # `/opt/ibm/snsc/bin/shutdown.sh`
3. Change directory to Switch Center installation directory by issuing the following command:

   # `cd /opt/ibm/snsc`
4. Remove conf, database, and logs folders by issuing the following command:

   # `rm -rf conf database logs`
5. Copy the backup file (ref: 3.1.2.2) to the following directory:

   `/opt/ibm/snsc`
6. Extract the backup file contents by issuing the following command:

   # `j2re/bin/jar xvf` <*backup file name*>

   For example, if the backup file name is `SNSC_5.2.1.0_20100723_140143.zip`, then the command should be as follows:

   # `j2re/bin/jar xvf SNSC_5.2.1.0_20100723_140143.zip`
7. Start SNSC services by issuing the following command:

   # `/opt/ibm/snsc/bin/startup.sh`

Taking IBM System Networking Switch Center Support Dump

Switch Center support dump helps debugging the problem associated with configuration files and database. You can take the support dump using the following steps:

1. Choose **Maintenance > Data Backup > SNSC Support Dump** to launch the window.
2. (Optional) If you wish to include database, check **Include Database**.
3. Click **Save**, which brings up the save dialog.
4. Select the directory where you want to save the Switch Center support dump and click **OK**.

The support dump file is named as follows:
`SNSC_SupportDump_<version>_<date>_<time>.zip`

Where:

<*version*> is the Switch Center version in a.b.c.d format.

<*date*> is the date on the Switch Center server system in yyyymmdd format, on which the backup operation was initiated.

<*time*> is the time on the Switch Center server system in HHMMSS format, at which the backup operation was initiated.

For example, if the support dump is initiated in Switch Center 6.1.0 on 23rd July 2010 at 14:01:43 hours, the support dump file is named as:
`SNSC_SupportDump_5.2.1.0_20100723_140143.zip`

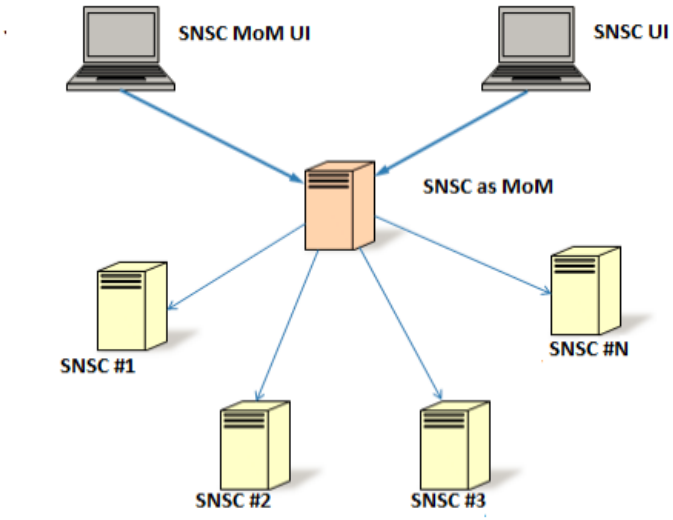
Manager of Managers

If you plan to deploy multiple instances of Switch Center (SNSC), such as when managing thousands of devices, you can configure an additional instance of Switch Center to function as a Manager of Managers (MoM).

Manager of Managers Overview

Figure 96 on page 730 illustrates how Switch Center can serve as Manager of Managers (MoM),

Figure 96 IBM System Networking Switch Center as MoM



As seen in the overview picture:

- One of the Switch Center instances is configured to support MoM functionality.
- The Switch Center enabled with MoM collects selected attributes from all the devices discovered in other instances of Switch Center (SNSC #1 through SNSC #*N*).
- The Switch Center MoM consolidates the collected information, which can be viewed using a separate user interface (SNSC MoM UI).
- The Switch Center instance with MoM enabled on it also serves, in parallel, as a regular Switch Center. This functionality can be accessed using the regular Switch Center UI.

Enabling the Manager of Managers Service

By default, the Manager of Managers (MoM) service is disabled. You can enable this service on any one instance using the following steps:

1. Stop SNSC Service:

   On a Linux system, issue the following command:
   `# /opt/ibm/snsc/bin/shutdown.sh`

2. Navigate to the following directory:
   `<SNSC INSTALLATION DIR>/conf`
3. Open the following file in a text editor: `server_conf.properties`
4. Set `enable_mom_service` to `true`.
5. By default, Switch Center MoM collects the data from other configured instances once every five minutes. You can change this value using `setting mom_server_polling_interval`.
6. Start SNSC Service:

   On a Linux system, issue the following command:
   `# /opt/ibm/snsc/bin/startup.sh`

Logging In to the Manager of Managers

You can login to Manager of Managers (MoM) UI using the following steps:

1. Launch a browser and enter the following URL:

   If you want to use HTTP, the URL is `http://`<*hostname*>`:40080/snscmom`

   If you prefer secure HTTP (HTTPs), the URL is `https://`<*hostname*>`:40443/snscmom`

2. Use the same credentials that you use for logging in to Switch Center to gain access to MoM features.

About Manager of Managers Windows and Panels

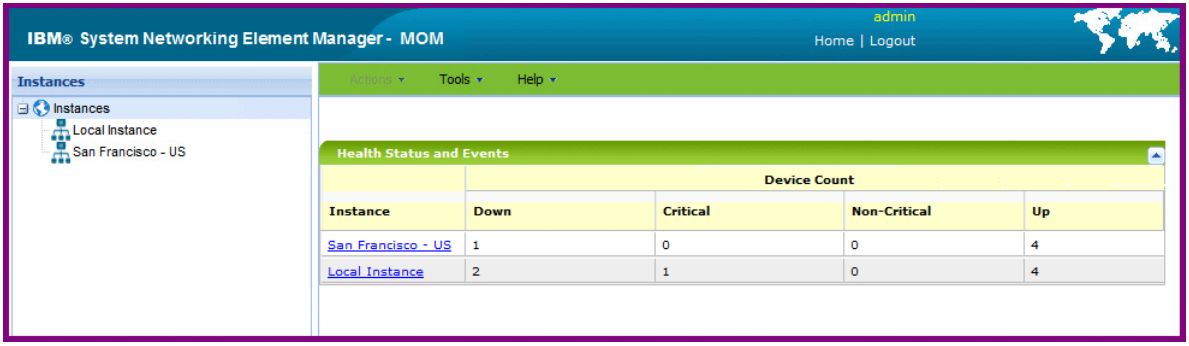
The following material describes the various Manager of Managers (MoM) user interface panels.

Main Window

Once you successfully login to the MoM, you will be presented with the Main Window (see Figure 97 on page 734).

The Main Window lists configured instances in the navigation panel on the left side of the window. The main content pane shows the health status summary associated with the configured instances. This health status summary is equivalent to Summary Status window shown in that instance of Switch Center (see “The Summary Status Pane” on page 73).

Figure 97 MoM Main Window



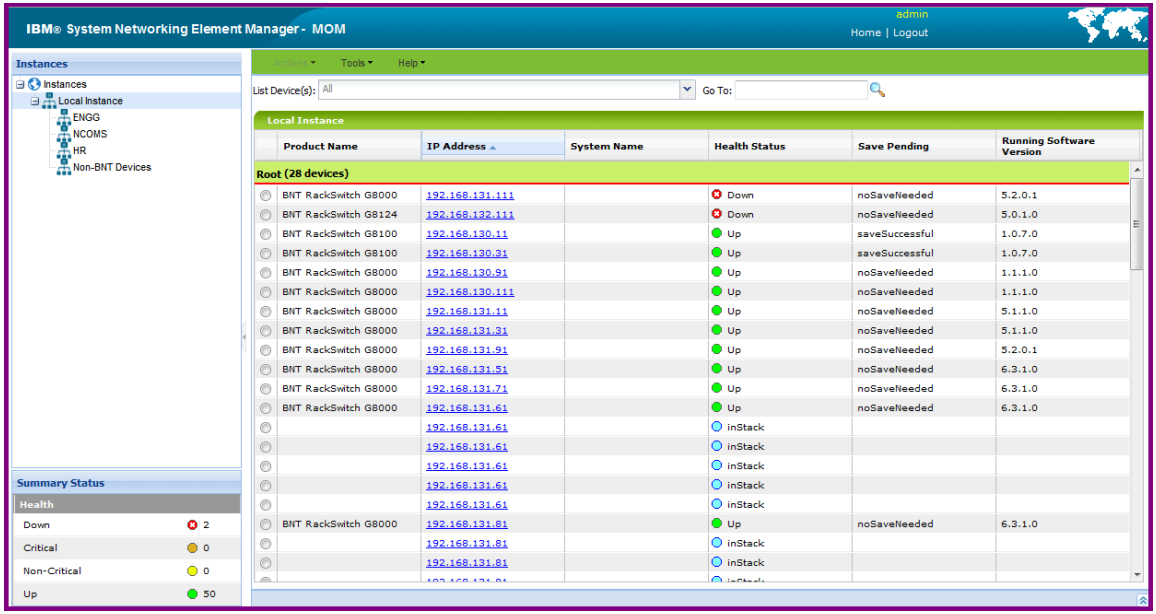
Note: You can navigate back to the Main Window from the rest of the windows by clicking the **Instances** node in the Instances navigation tree.

Instance View Window

From the Main Window, you can open the Instance View window (see Figure 98 on page 735) using one of the following steps:

- Click on any Switch Center instance in the navigation tree (Instances), or
- Click any Instance link in Health Status table view.

Figure 98 MoM Instance View Window



The instance view window shows the following set of panels:

- Instances tree (upper-left panel) showing the nodes/domains configured in that instance of Switch Center.
- Summary Status (lower-left panel) showing the summary information (similar to what is shown in case of Switch Center).
- Content pane showing the list of devices discovered in that instance of Switch Center, along with the brief summary.

Note: Unlike the Switch Center window, the device list allows you to select only one device at a time.

Summary Panel

From Instance View window, you can launch the summary panel for any listed device (see Figure 99 on page 736) using one of the following steps:

- Select a device in the content pane and click **Actions > Summary**, OR
- Click the **IP Address** link in device list table.

Figure 99 MoM Summary Panel

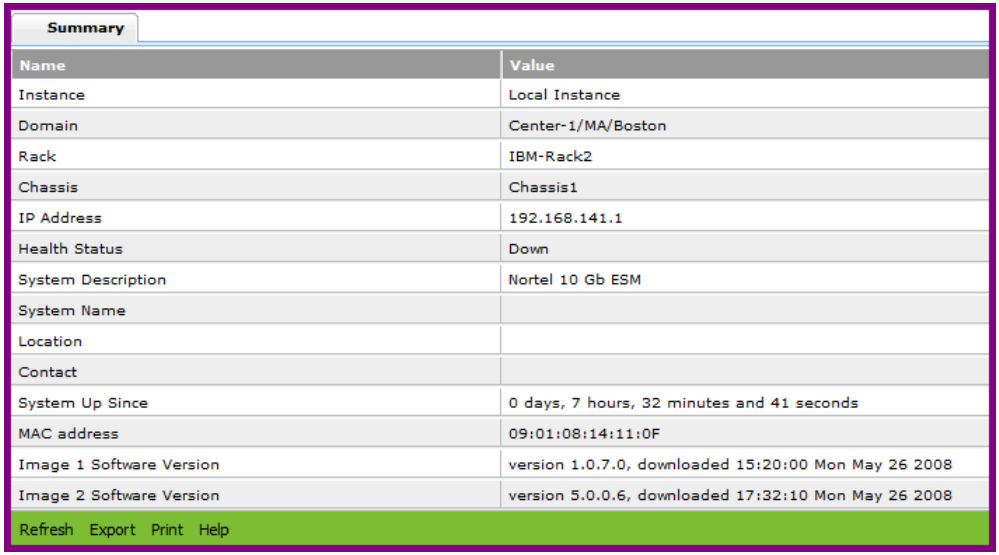


Table 376 MOM Summary field descriptions

Field	Description
Instance	The SNSC instance in which the switch is discovered
Domain	The Domain name in which the switch is listed in the navigation tree.
Rack	The Rack name (in the navigation tree) in which the switch is contained
Chassis	The Chassis name (in the navigation tree) in which the switch is contained
IP Address	The IP address of the switch.
Health Status	Status showing whether the switch is currently up or down.
System Description	Displays the product name of the switch.
System Name	The administrative-assigned name for the switch.
Location	The physical location of the switch.

Table 376 MOM Summary field descriptions

Field	Description
Contact	The switch contact for support
Image1 Software Version	The software version of the image stored in the first image storage area.
Image2 Software Version	The software version of the image stored in the second image storage area.
Boot Version	The software version of the switch boot code.
Running Software Version	The version of the software image that is currently running on the system.
Hardware Serial Number	The hardware serial number of the switch.
Image for Next Reset	The firmware to choose for the next switch reset
Config For Next Reset	The configuration to choose for the next switch reset.
Save Pending	Gives information whether any applied changes are not yet saved to FLASH memory on the switch.
Apply Pending	Displays information whether any changes are not yet applied on the switch.
Module Bay	The module bay in which the switch is installed.
Manufacture Date	Date the device was manufactured.
Panic Dump	Displays panic dump status.
Time and Reason for last boot	Displays information about the last reboot cycle. For example, the reason might be power cycle.

Performing Actions in the Manager of Managers

You can perform various actions through the Manager of Managers (MoM), such as Adding an instance, Deleting or Renaming an existing instance, Launching Switch Version Report, or launching Switch Center for an instance or a device.

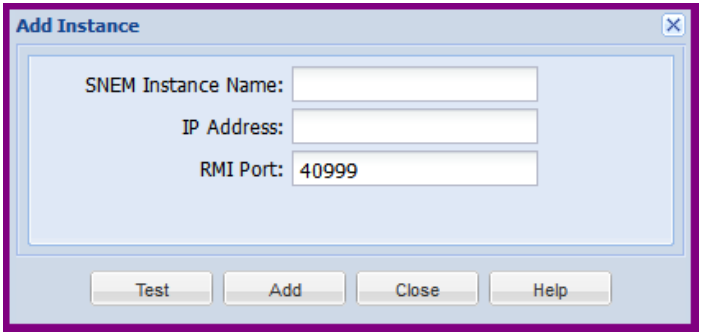
Adding an Instance of IBM System Networking Switch Center

Note: This facility is available only to those users logged in as an administrator (if the Root user is disabled), or to those users who know root password (if the Root user is enabled).

This procedure adds an instance of Switch Center to the MoM.

1. Click **Tools > Add Instance** to launch the window for adding an instance (see Figure 100 on page 739).
2. Enter a unique name for the Switch Center instance.
3. Enter the IP address of the server on which the Switch Center instance is running.
4. If the Switch Center instance to be added uses a different RMI port, change it accordingly.
5. If the Root user is enabled, enter the root password in the Root Password field (this field is not visible if the Root user is disabled).
6. (Optional) To verify the IP address and RMI port configuration, click **Test**. When you click the Test button, MoM checks whether the specified instance is accessible.
7. Click **Add** to add the instance.

Figure 100 MoM Add Instance Window



Renaming an Instance of IBM System Networking Switch Center

Note: This facility is available only to those users logged in as an administrator (if the Root user is disabled), or to those users who know root password (if the Root user is enabled).

This procedure renames an existing instance of Switch Center.

1. Navigate to the MoM Main Window.
2. Right-click an instance you want to rename, and select **Rename Instance**.
3. Enter a new name.
4. If the Root user is enabled, enter the root password in the Root Password field (this field is not visible if the Root user is disabled).
5. Click **OK**.

Note: Renaming is not allowed for the default Local Instance.

Deleting an Instance of IBM System Networking Switch Center

Note: This facility is available only to those users logged in as an administrator (if the Root user is disabled), or to those users who know root password (if the Root user is enabled).

This procedure deletes an existing instance of Switch Center.

1. Navigate to the MoM Main Window.
2. Right-click an instance you want to delete, and select **Delete Instance**
3. If the Root user is enabled, enter the root password in the Root Password field (this field is not visible if the Root user is disabled).
4. Click **OK**.

Note: Deletion is not allowed for the default Local Instance.

Launching Switch Version Report

The Switch Version Report (see Figure 101 on page 742) provides a summary of data about all discovered switches across one or more Switch Center instances that are added in the MoM.

To launch the Switch Version Report showing the summary of data from all the added instances:

- Right-click **Instances** node in Instances tree and select **Switch Version Report**, OR
- Click **Instances** node in Instances tree and select **Tools > Switch Version Report**.

Figure 101 MoM Switch Version Report

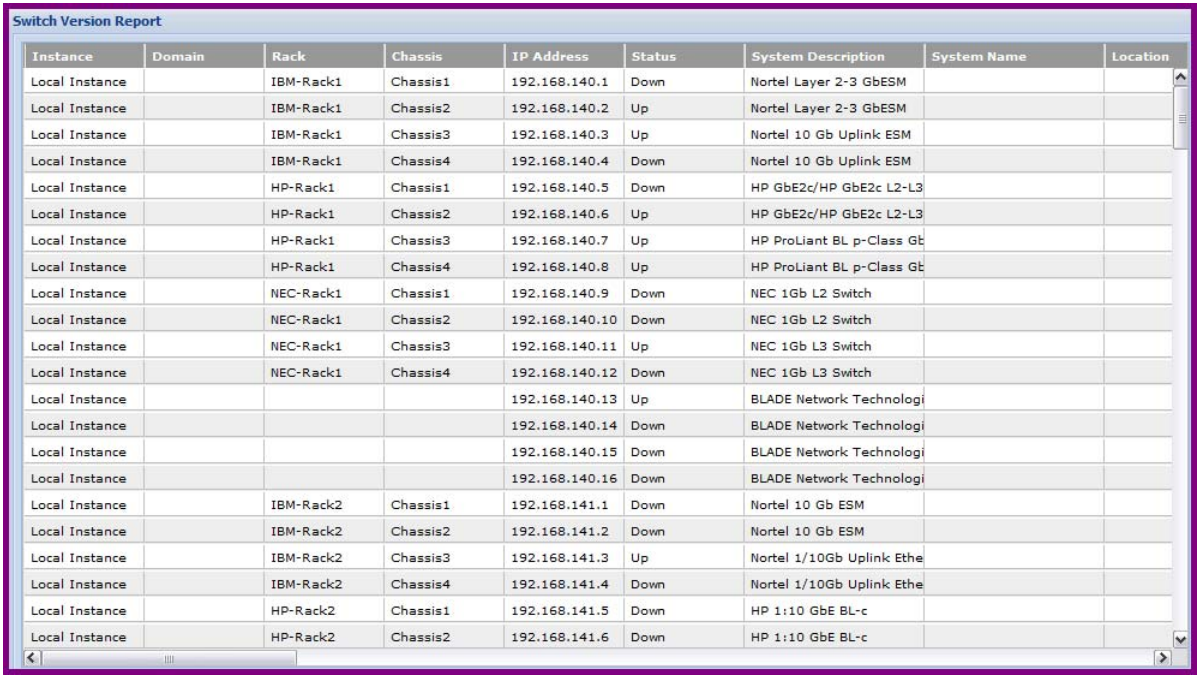


Table 377 MOM Switch Version Report field descriptions

Field	Description
Instance	The SNSC instance in which the switch is discovered
Domain	The Domain name in which the switch is listed in the navigation tree.

Table 377 MOM Switch Version Report field descriptions

Field	Description
Rack	The Rack name (in the navigation tree) in which the switch is contained
Chassis	The Chassis name (in the navigation tree) in which the switch is contained
IP Address	The IP address of the switch.
Health Status	Status showing whether the switch is currently up or down.
System Description	Displays the product name of the switch.
System Name	The administrative-assigned name for the switch.
Location	The physical location of the switch.
Contact	The switch contact for support
Image1 Software Version	The software version of the image stored in the first image storage area.
Image2 Software Version	The software version of the image stored in the second image storage area.
Boot Version	The software version of the switch boot code.
Running Software Version	The version of the software image that is currently running on the system.
Hardware Serial Number	The hardware serial number of the switch.
Image for Next Reset	The firmware to choose for the next switch reset
Config For Next Reset	The configuration to choose for the next switch reset.
Save Pending	Gives information whether any applied changes are not yet saved to FLASH memory on the switch.
Apply Pending	Displays information whether any changes are not yet applied on the switch.
Module Bay	The module bay in which the switch is installed.
Manufacture Date	Date the device was manufactured.
Panic Dump	Displays panic dump status.
Time and Reason for last boot	Displays information about the last reboot cycle. For example, the reason might be power cycle.

Launching IBM System Networking Switch Center

You can launch Switch Center for any instance or for any specific device.

To launch Switch Center for an instance:

- Right-click an instance in the Instances tree and select **SNSC Launch**, OR
- Select an instance in the Instances tree and click **Tools > SNSC Launch**.

To launch Switch Center for a specific device:

1 Navigate to Instance View Window.

2 Select the device for which you wish to launch Switch Center.

3 Click **Tools > SNSC Launch**.

Note: When Switch Center is launched, it prompts you to login. If Switch Center is launched for a specific device, after successful login, the Summary page associated with the selected device is displayed.

Using the Command Line Interface

Switch Center (SNSC) provides a command line interface (CLI), an equivalent to the Switch Center UI, which user can invoke on the system where Switch Center is installed.

The CLI can be launched a single command or in a CLI shell that allows you to execute multiple commands. Here is an example of how the CLI shell works:

The CLI session is started by issuing the following command: `snsccli`
The command results in the following user/password prompts:

```
Enter user-id:
Enter password:
```

Once the user-id and password combination is validated, the CLI shell comes into existence. For admin user, the prompt will be displayed as `snsccli#` and for non-admin users, it will be `snsccli>`

You can execute the supported commands such as '`help`', which displays the general help listing the supported commands. You can also type-in *<command>* **`help`**, which results in the help display for that command. This is more or less similar to DOS Commands on Windows CMD shell.

```
snsccli# help
usage:
 device     Displays the device configuration options for SNSC.
 firmware   Provides backup/upgrade options.
 options    Configures the general configurations on SNSC.
 reports    Display the individual reports information.
 stats      Display the statistics for the selected option.
 info       Display the information table for the selected option.
 show       Displays the current configurations on SNSC for the selected
            option.
 help       Displays the global help information.
 exit       Exits from SNSCCLI session.

snsccli# exit
```

Launching the CLI Shell

You can launch the CLI shell on the system where Switch Center is installed using the following On a Linux installation:

- From any shell terminal, issue the following command:
  `/opt/ibm/snsc/bin/snsccli`

Note: When the CLI shell is launched, the system prompts you to enter username and password to gain access.

Using the CLI for Individual Command Execution

The CLI allows you to execute an individual command if you supply all the required information in one statement. When the CLI completes the operation, it sets the exit status to either 0 or other integer value indicating, respectively, the success or the failure of the operation. For example, you can invoke the CLI in the following way:

<*Path to CLI*> **`-username`** <*user*> **`-password`** <*password*> [**`command`**]

The above type of invocation results in executing the CLI command outside the shell and setting the exit status. You can check the exit status using the following steps:

On Windows installation, execute the command in CMD shell:

- **`echo %ERROR_LEVEL%`**

On AIX or Linux installation, execute the following shell command:

- **`echo $?`**

CLI Command Reference

This entire section provides the usage references for the supported Switch Center CLI commands.

Restrictions: If the `root` user is disabled, all `options` and `firmware` commands are accessible only to admin privileged users. In case, if the `root` user is enabled, the `options` commands that require the `root` password for execution are available to all users.

options general

Command Syntax and Usage
options general Displays the usage information.
options general -concurrent_limit [<*value*>] Sets the Concurrent Limit with the given value. If the value is not specified, it displays the current setting and prompts you to enter a new value. **SNSC UI Equivalent:** Options > General Properties
options general -session_timeout [<*value*>] Sets the Session Timeout with the given value. If the value is not specified, it displays the current Session Timeout setting and prompts you to enter a new value. **SNSC UI Equivalent:** Options > General Properties
options general -temp_mode [**C|F**] Sets the temperature sensor display to show the reading in Celsius (C) or Fahrenheit (F). **SNSC UI Equivalent:** Options > General Properties
options general -concurrent_limit <*value*> **-** **session_timeout** <*value*> **-temp_mode** [**C|F**] Sets the Concurrent Limit, the Session Timeout, and the Temperature Display Mode parameters. **SNSC UI Equivalent:** Options > General Properties

options refresh

Command Syntax and Usage
options refresh Displays the usage information.
options refresh -time_interval [<*value*>] Sets the Refresh Time Interval with the given value. If the value is not specified, it displays the current Refresh Time Interval setting and prompts you to enter a new value. **SNSC UI Equivalent:** Options > Refresh Configuration

options security

Command Syntax and Usage
options security Displays the usage information.
options security -password [<*user*>] Sets the password of the given user. If the user is not specified, the system prompts you to enter the user name. While setting the password, the system prompts you to type-in admin password to complete the operation. **SNSC UI Equivalent:** Options > Security Configuration

Command Syntax and Usage

options security mechanism -type [**local**|**radius**|**tacacs**]
[**-admin_pass** | **-root_pass** <*value*>]
[**-pri_srv** <*value*>]
[**-sec_srv** <*value*>]
[**-pri_sec** <*value*>]
[**-sec_sec** <*value*>]
[**-port** <*value*>]
[**-auth_level** <default|alternate>]
[**-timeout** <*value*>]
[**-retries** <*value*>]

Sets the authentication mechanism (local, TACACS+ or RADIUS). In case of TACACS+ or RADIUS, it also requires you to specify the values for other parameters such as primary/secondary servers, primary/secondary secrets, and so on.

Notes:

In case of TACACS+ or RADIUS, if other parameters are not supplied in the command input, the system prompts you to specify the following:

(i) If root user is enabled, then the system prompts for the root password or else, prompts for admin password.

(ii) Primary and Secondary server addresses

(iii) Secrets for Primary and Secondary servers

(iv) Server port

(v) Authorization Level (only for TACACS+)

(vi) Timeout to use

(vii) Number of retries

SNSC UI Equivalent: Options > Authentication Configuration

options purge

Command Syntax and Usage
options purge Displays the usage information.
options purge -days <*value*> Sets the purge type to “days” and sets the number of days with the given value. **SNSC UI Equivalent:** Options > DB Data Purge Configuration
options purge -events <*value*> Sets the purge type to “events” and sets the events count with the given value. **SNSC UI Equivalent:** Options > DB Data Purge Configuration

options logfile

Command Syntax and Usage
options logfile Displays the usage information.
options logfile -max [<*value*>] Sets the maximum number of backup files to use while logging. If the value is not specified, it displays the current setting and prompts you to enter a new value. **SNSC UI Equivalent:** Options > Log File Configuration
options logfile -size [<*value*>] Sets the maximum size in MB for the log file. If the value is not specified, it displays the current setting and prompts you to enter a new value. **SNSC UI Equivalent:** Options > Log File Configuration
options logfile -max <*value*> **-size** <*value*> Sets the maximum number of backup files and the maximum size in MB for the log file. **SNSC UI Equivalent:** Options > Log File Configuration

options data_collection

Command Syntax and Usage
options data_collection Displays the usage information.
options data_collection -health [<*value*>] Sets the polling interval for health check service. If the value is not specified, it displays the current setting and prompts you to enter a new value. **SNSC UI Equivalent:** Options > Data Collection Configuration
options data_collection -perf [<*value*>] Sets the polling interval for performance statistics collection. If the value is not specified, it displays the current setting and prompts you to enter a new value. **SNSC UI Equivalent:** Options > Data Collection Configuration
options data_collection -health <*value*> **-perf** <*value*> Sets the polling interval for health check service and performance statistics collection. **SNSC UI Equivalent:** Options > Data Collection Configuration

options cli_conf

Command Syntax and Usage
options cli_conf Displays the usage information.
options cli_conf -attempts [<*value*>] Sets the number of unsuccessful login attempts the CLI session will allow. If the value is not specified, it displays the current setting and prompts for a new value.
options cli_conf -idle [<*value*>] Sets the idle session timeout value in minutes. If the value is not specified, it displays the current setting and prompts you to enter a new value.

Command Syntax and Usage
options cli_conf -attempts <*value*> **-idle** <*value*> Sets the number of unsuccessful login attempts and the idle session timeout value in minutes.

options hpsim

Command Syntax and Usage
options hpsim Displays the usage information. **Note**: This feature might not be available in your software edition. If so, please disregard this information.
options hpsim -write_comm [<*value*>] Sets the write community to use with the devices discovered/synchronized by/ from HP SIM. If the value is not specified, it displays the current setting and prompts you to enter a new value. **SNSC UI Equivalent:** Options > HP SIM Connector > Set SNMP Write Community

Command Syntax and Usage

options hpsim sync -status {**on**|**off**}
[**-ip** <*value*>]
[**-user** <*value*>]
[**-pass** <*value*>]
[**-poll_intr** <*value*>]
[**-test**]

Turns on or turns off the HP SIM sync feature. If the value (on/off) is not specified, it displays the current setting and prompts you to enter a new value.

When the sync feature is set to “on” and if the other parameters are not specified, the command prompts you to specify HP SIM Server IP address, user name and password to access HP SIM and the polling interval in minutes.

You can also specify the `-test` option at the end of the command. The `-test` option directs the system to first validate whether the parameters are correct. The changes are saved only if the parameters are valid, otherwise an error message is displayed.

SNSC UI Equivalent: Options > HP SIM Connector > Configuration

options dial_home

Command Syntax and Usage

options dial_home

Displays the usage information.

Note: This feature might not be available in your software edition. If so, please disregard this information.

options dial_home email_conf
[**-srv_addr** <*value*>]
[**-srv_port** <*value*>]
[**-format** {**Plain-Text**|**XML**}]
[**-sender_email** <*value*>]
[**-recipient_email** <*value*>]
[**-user** <*value*>]
[**-pass** <*value*>]
[**-conn** {**No**|**TLS**|**SSL**}]
[**-test**]

Configures the email parameters to use for generating email alerts. You can also specify the -test option at the end of the command. The -test option directs the system to first validate whether the parameters are correct. The changes are saved only if the parameters are valid, otherwise an error message is displayed.

Note:

If other parameters are not supplied, the system prompts you to specify:

(i) Email Server Address, Port, User and Password details, connection type

(ii) Format to use while sending the alerts

(iii) Sender and Recipient Email Addresses

SNSC UI Equivalent: Options > Dial Home > Email Configuration

Command Syntax and Usage

options dial_home trap_conf
[**-dev_type** <*value*>]
[**-trap_type** <*value*>]
[**-ip** <*value*>]
[**-descr** <*value*>]

Configures the trap parameters to use for generating email alerts.

Note:

If other parameters are not supplied, the system prompts you to specify:

(i) Device type

(ii) Trap type

(iii) IP addresses

(iv) Trap Description

SNSC UI Equivalent: Options > Dial Home > Traps Configuration

options dial_home trap_del
[**-dev_type** <*value*>]
[**-trap_type** <*value*>]
[**-ip** <*value*>]

Deletes the configured Dial Home entry for the specified device type and the trap.

Note:

If other parameters are not supplied, the system prompts you to specify:

(i) Device type

(ii) Trap type

(iii) IP addresses

SNSC UI Equivalent: Options > Dial Home > Traps Configuration

options vm

Command Syntax and Usage
options vm Displays the usage information.
options vm -poll_int [<*value*>] Allows you to configure the VM polling interval. **SNSC UI Equivalent:** Options > VM Management Server Connector > Configuration

Command Syntax and Usage

options vm add -type [**http**|**https**]
[**-port** <*value*>]
[**-ip** <*value*>]
[**-user** <*value*>]
[**-pass** <*value*>]
[**-ssl_cert** <*value*>]
[**-test**]

Allows you to configure the protocol to use by Switch Center to communicate with VM Server. You can also specify the `-test` option at the end of the command. The `-test` option directs the system to first validate whether the parameters are correct. The changes are saved only if the parameters are valid, otherwise an error message is displayed.

Note:

If optional parameters are not specified, the system prompts you to specify:

(i) Protocol to use

(ii) Port

(iii) IP Address of the VM Server

(iv) User name and Password for VM Server

(v) SSL Certificate

SNSC UI Equivalent:

Options > VM Management Server Connector > Configuration

Command Syntax and Usage

options vm del -type [**http**|**https**]
[**-port** <*value*>]
[**-ip** <*value*>]
[**-user** <*value*>]

Allows you to delete the configured entry used by Switch Center to communicate with VM Server.

Note:

If optional parameters are not specified, the system prompts you to specify:

(i) Protocol to use

(ii) Port

(iii) IP Address of the VM Server

(iv) User name and Password for VM Server

SNSC UI Equivalent:

Options > VM Management Server Connector > Configuration

show

Command Syntax and Usage
show Displays the usage information.
show auth_conf Displays the current authentication mechanism and its configuration. **SNSC UI Equivalent:** Options > Authentication Configuration
show cli_conf Displays the current CLI configuration.
show data_collection_conf Displays the current Data collection settings. **SNSC UI Equivalent:** Options > Data Collection Configuration
show data_purge_conf Displays the current data purging settings. **SNSC UI Equivalent:** Options > DB Data Purge Configuration
show dial_home -email Displays the email settings for Dial Home. **Note**: This feature might not be available in your software edition. If so, please disregard this information. **SNSC UI Equivalent:** Options > Dial Home > Email Configuration
show dial_home -traps Displays the traps settings for Dial Home. **Note**: This feature might not be available in your software edition. If so, please disregard this information. **SNSC UI Equivalent:** Options > Dial Home > Traps Configuration

Command Syntax and Usage
show general_conf Displays the general settings such as concurrent limit and session timeout. **SNSC UI Equivalent:** Options > General Properties
show hpsim_conf -hpsim_server Displays the HP SIM sync configuration. **Note**: This feature might not be available in your software edition. If so, please disregard this information. **SNSC UI Equivalent:** Options > HP SIM Connector > Configuration
show hpsim_conf -write_comm Displays the write community to use for devices discovered through HP SIM sync. **Note**: This feature might not be available in your software edition. If so, please disregard this information. **SNSC UI Equivalent:** Options > HP SIM Connector > Set SNMP Write Community
show license_info Displays the license information **SNSC UI Equivalent:** Help > About IBM System Networking Switch Center
show logfile_conf Displays the current log settings **SNSC UI Equivalent:** Options > Log File Configuration
show refresh_conf Displays the current refresh configuration **SNSC UI Equivalent:** Options > Refresh Configuration

Command Syntax and Usage
show vm_conf -ssl_cert Displays the SSL certificate file details used in VM Management Server configuration. **SNSC UI Equivalent:** Options > VM Management Server Connector > Configuration
show vm_conf -vm_server Displays the VM Management Server configuration details. **SNSC UI Equivalent:** Options > VM Management Server Connector > Configuration

device add

Command Syntax and Usage

device add

Displays the usage information.

device add -ip *<IP address>*
[**-version** {**v1**|**v2c**|**v3**}]
[**-rcomm** *<value>*]
[**-wcomm** *<value>*]
[**-user** *<SNMPv3 username>*]
[**-auth_proto** {**MD5**|**SHA1**|**NONE**}]
[**-auth_pass <password>**]
[**-priv_proto** {**DES**|**NONE**}]
[**-priv_pass <password>**]
[**-root_pass <password>**]

Discovers the given device, if supported, in Switch Center.

Notes: If not supplied in the command input, the system prompts you to specify the following:

(i) The SNMP version to use (v1, v2c or v3)

(ii) If v1 or v2c is selected, the system prompts for:

(a) Read community string

(b) Write community string

(iii) If v3 is specified, the system prompts for:

(a) SNMPv3 user name

(b) Authentication protocol to use

(c) Authentication password (only if Authentication protocol is NOT set to NONE)

(d) Privacy protocol to use (only if Authentication protocol is NOT set to NONE)

(e) Privacy password (only if Privacy protocol is NOT set to NONE).

(iv) If root user is enabled, then the system prompts for the root password.

SNSC UI Equivalent:

Right-click any Domain and click **Add Device** or

Options > Discovery > Discovery Configuration > Insert

Command Syntax and Usage

device add -range *<IP address range>*
[**-version** {**v1**|**v2c**|**v3**}]
[**-rcomm** *<value>*]
[**-wcomm** *<value>*]
[**-user** *<SNMPv3 username>*]
[**-auth_proto** {**MD5**|**SHA1**|**NONE**}]
[**-auth_pass** *<password>*]
[**-priv_proto** {**DES**|**NONE**}]
[**-priv_pass** *<password>*]
[**-root_pass** *<password>*]

Discovers BNT devices in the given IP address range. The IP address range should be specified as *<Start IP Address>***-***<End Octet>*. For example, the input `192.168.1.1-20` indicates the range from 192.168.1.1 to 192.168.1.20

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) The SNMP version to use (v1, v2c or v3)

(ii) If v1 or v2c is selected, the system prompts for:

(a) Read community string

(b) Write community string

(iii) If v3 is specified, the system prompts for:

(a) SNMPv3 user name

(b) Authentication protocol to use

(c) Authentication password (only if Authentication protocol is NOT set to `NONE`)

(d) Privacy protocol to use (only if Authentication protocol is NOT set to `NONE`)

(e) Privacy password (only if Privacy protocol is NOT set to `NONE`).

(iv) If root user is enabled, then the system prompts for the root password.

SNSC UI Equivalent: Options > Discovery > Discovery Configuration > Insert

device delete

Command Syntax and Usage
device delete
Displays the usage information.
device delete -ip <*IP address*> [**-root_pass** <*password*>]
Deletes the given device, if discovered in Switch Center. **Note:** If the root user is enabled and the password parameter is not supplied within the command, then the system prompts for the root password. **SNSC UI Equivalent:** Device > Actions > Delete Group Operations > Group Actions > Delete
device delete -range <*IP address range*> [**-root_pass** <*password*>]
Deletes the discovered BNT devices that falls in the given IP address range. The IP address range should be specified as <*Start IP Address*>**-**<*End Octet*>. For example, the input `192.168.1.1-20` indicates the range from 192.168.1.1 to 192.168.1.20 **Note:** If the root user is enabled and the password parameter is not supplied within the command, then the system prompts for the root password. **SNSC UI Equivalent:** Although, there is no range based delete in Switch Center UI, but this CLI command is more or less similar to selecting multiple devices and deleting them using the folloiwng menu: Group Operations > Group Actions > Delete

device import

Command Syntax and Usage

device import

Displays the usage information.

device import -file <*filename*>
[**-version** {**v1**|**v2c**|**v3**}]
[**-rcomm** <*value*>]
[**-wcomm** <*value*>]
[**-user** <*SNMPv3 username*>]
[**-auth_proto** {**MD5**|**SHA1**|**NONE**}]
[**-auth_pass** <*password*>]
[**-priv_proto** {**DES**|**NONE**}]
[**-priv_pass** <*password*>]
[**-timeout** <*value*>]
[**-retries** <*value*>]
[**-root_pass** <*password*>]

Discovers the IP addresses listed in the file provided the given IP address represents a supported device.

Notes: If not supplied in the command input, the system prompts you to specify the following:

(i) The SNMP version to use (v1, v2c or v3)

(ii) If v1 or v2c is selected, the system prompts for:

(a) Read community string

(b) Write community string

(iii) If v3 is specified, the system prompts for:

(a) SNMPv3 user name

(b) Authentication protocol to use

(c) Authentication password (only if Authentication protocol is NOT set to NONE)

(d) Privacy protocol to use (only if Authentication protocol is NOT set to NONE)

(e) Privacy password (only if Privacy protocol is NOT set to NONE).

(iv) If root user is enabled, then the system prompts for the root password.

SNSC UI Equivalent: Options > Discovery > Import Device List

device export

Command Syntax and Usage
device export
Displays the usage information.
device export -file *<filename>*
Exports the discovered devices information to a file. **SNSC UI Equivalent:** Options > Discovery > Export Device List

reports event

Command Syntax and Usage
reports event
Displays the usage information. **Note**: This feature might not be available in your software edition. If so, please disregard this information.
reports event -snsc *<IP address>*
Displays the Switch Center alerts associated with the given IP address.
reports event -snsc all
Displays the Switch Center alerts associated with all the discovered devices. **SNSC UI Equivalent:** Reports > SNSC Alerts
reports event -snmp *<IP address>*
Displays the SNMP events received from the given IP address. **SNSC UI Equivalent:** {Device Console} > Monitor > Summary > View Events
reports event -snmp all
Displays the SNMP events received from all the discovered devices. **SNSC UI Equivalent:** Reports > Event List

Command Syntax and Usage
reports event -syslog *<IP address>* Displays the Syslog messages received from the given IP address. **SNSC UI Equivalent:** {Device Console} > Monitor > Summary > View Syslogs
reports event -syslog all Displays the Syslog messages received from all the discovered devices. **SNSC UI Equivalent:** Reports > Syslog List

reports svr

Command Syntax and Usage
reports svr Displays the usage information.
reports svr -ip all Displays the switch version report of all the discovered devices **SNSC UI Equivalent:** Reports > Switch Version Report.
reports svr -ip *<IP Address List>* Displays the switch version report of those switches specified in the IP Address List in comma separated value (CSV) format. **SNSC UI Equivalent:** Group Operations > Switch Version Report.

reports vmr

Command Syntax and Usage
reports vmr Displays the usage information.
reports vmr -datacenter Displays the VMs retrieved from the VM Data Center. **SNSC UI Equivalent:** Reports > VM Data Center Report
reports vmr -group Displays the VM Groups details associated with Virtual Switch Groups. **SNSC UI Equivalent:** Reports > VMready VM Report > VM Groups
reports vmr -ports Displays the Port Groups details associated with Virtual Switch Groups. **SNSC UI Equivalent:** Reports > VMready VM Report > Port Groups

stats acl

Command Syntax and Usage
stats acl Displays the usage information.
stats acl -acl_stats [<*IP address*>] Displays the ACL statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Access Control List > ACL Statistics

Command Syntax and Usage

`stats acl -port_stats` [*<IP address>*]

Displays the ACL Port statistics of the given switch.

Note: If the IP address is not specified, the system prompts you to type-in the IP address.

SNSC UI Equivalent: {Device Console} > Monitor > Access Control List > ACL Port Statistics

stats bridge

Command Syntax and Usage
stats bridge Displays the usage information.
stats bridge -forwarding [<*IP address*>] Displays the Bridge Forwarding statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Bridge > Forwarding Statistics

stats port

Command Syntax and Usage
stats port Displays the usage information.
stats port -8021x [<*IP address*>] Displays the Port 802.1x statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Port > 802.1x Statistics
stats port -authdiag [<*IP address*>] Displays the Port Authenticator Diagnostics statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Port > Authenticator Diagnostics Statistics
stats port -bridge [<*IP address*>] Displays the Port Bridge statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Port > Bridge Statistics

Command Syntax and Usage

stats port -ethernet [<*IP address*>]

Displays the Port Ethernet Error statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Port > Ethernet Error Statistics

stats port -interface [<*IP address*>]

Displays the Port Interface statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Port > Interface Statistics

stats port -ip [<*IP address*>]

Displays the Port IP statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Port > IP Statistics

stats port -lacp [<*IP address*>]

Displays the Port LACP statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Port > LACP Statistics

stats routing

Command Syntax and Usage
stats routing Displays the usage information.
stats routing -arp [<*IP address*>] Displays the ARP statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > ARP Statistics
stats routing -dns [<*IP address*>] Displays the DNS statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > DNS Statistics
stats routing -icmp_in [<*IP address*>] Displays the ICMP In statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > ICMP In Statistics
stats routing -icmp_out [<*IP address*>] Displays the ICMP Out statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > ICMP Out Statistics
stats routing -igmp_snoop [<*IP address*>] Displays the IGMP Snooping statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > IGMP Snooping Statistics

Command Syntax and Usage

stats routing -ip [<*IP address*>]

Displays the IP statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > IP Statistics

stats routing -ip_intf [<*IP address*>]

Displays the IP Interface statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > IP Interface Statistics

stats routing -ospf_area [<*IP address*>]

Displays the OSPF Area statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Statistics

stats routing -ospf_area_intf [<*IP address*>]

Displays the OSPF Area Interface statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Interface Statistics

stats routing -ospf_area_intf_recv_err [<*IP address*>]

Displays the OSPF Area Interface Receive Error statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent:

{Device Console} > Monitor > Routing > OSPF Area Interface Receive Error Statistics

Command Syntax and Usage

stats routing -ospf_area_recv_err [<*IP address*>]

Displays the OSPF Area Receive Error statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Receive Error Statistics

stats routing -ospf_gen [<*IP address*>]

Displays the OSPF general statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF General Statistics

stats routing -ospf_intf_change [<*IP address*>]

Displays the OSPF Interface Change statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Interface Change Statistics

stats routing -ospf_intf_neigh [<*IP address*>]

Displays the OSPF Interface Neighbor statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > Interface Neighbor Statistics

stats routing -ospf_intf_trans [<*IP address*>]

Displays the OSPF Interface Transmission statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent:

{Device Console} > Monitor > Routing > OSPF Interface Transmission Statistics

Command Syntax and Usage

stats routing -ospf_neigh [<*IP address*>]

Displays the OSPF Area Neighbor statistics of the given switch.

Note: If the IP address is not specified, the system prompts you to type-in the IP address.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Neighbor Statistics

stats routing -ripv2 [<*IP address*>]

Displays the RIP v2 statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > RIP V2 Statistics

stats routing -route [<*IP address*>]

Displays the Routes statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > Route Statistics

stats routing -tcp [<*IP address*>]

Displays the TCP statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > TCP Statistics

stats routing -udp [<*IP address*>]

Displays the UDP statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > UDP Statistics

stats switch

Command Syntax and Usage
stats switch Displays the usage information.
stats switch -mpcpu [<*IP address*>] Displays the MP CPU statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Switch > MP CPU Statistics
stats switch -ntp [<*IP address*>] Displays the NTP statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Switch > NTP Statistics
stats switch -packet [<*IP address*>] Displays the Packet statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Switch > Packet Statistics
stats switch -snmp [<*IP address*>] Displays the SNMP statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Switch > SNMP Statistics
stats switch -stp [<*IP address*>] Displays the STP statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Switch > STP Statistics

Command Syntax and Usage

`stats switch -ufd` [*<IP address>*]

Displays the UFD statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Switch > UFD Statistics

stats virtual_routing

Command Syntax and Usage

`stats virtual_routing`

Displays the usage information.

`stats virtual_routing -virt_stats` [*<IP address>*]

Displays the Virtual Routing statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Virtual Routing > Virtual Routing Statistics

info 8021

Command Syntax and Usage
info 8021 Displays the usage information.
info 8021 -cosq [<*IP address*>] Displays the 802.1x Priority COSq information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > 802.1x/p > 802.1x Priority COSq
info 8021 -gen [<*IP address*>] Displays the 802.1x general information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > 802.1x/p > 802.1x General
info 8021 -port_priority [<*IP address*>] Displays the 802.1x Port Priority information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > 802.1x/p > Port Priority

info bridge

Command Syntax and Usage
info bridge Displays the usage information.
info bridge -base_port [<*IP address*>] Displays the Base Port information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Bridge > Base Port Information

Command Syntax and Usage

`info bridge -cist_bridge` [<*IP address*>]

Displays the CIST Bridge information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Bridge > CIST Bridge Information

`info bridge -cist_port` [<*IP address*>]

Displays the CIST Port information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Bridge > CIST Port Information

`info bridge -fdb` [<*IP address*>]

Displays the Forwarding Database information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Bridge > Forwarding Database Information

`info bridge -stp` [<*IP address*>]

Displays the STP information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Bridge > STP

info hotlinks

Command Syntax and Usage
info hotlinks Displays the usage information.
info hotlinks -hl_stats [<*IP address*>] Displays the Hotlinks statistics of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Hotlinks Statistics > Statistics

info port

Command Syntax and Usage
info port Displays the usage information.
info port -lacp_aggr [<*IP address*>] Displays the LACP aggregator information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Port > LACP Aggregator
info port -lacp_port_aggr [<*IP address*>] Displays the LACP port aggregator information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Port > LACP Port Aggregator

info routing

Command Syntax and Usage
info routing Displays the usage information.
info routing -arp [<*IP address*>] Displays the ARP information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > ARP
info routing -bgp_peers [<*IP address*>] Displays the BGP peers summary information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > Peers Summary
info routing -bgp_route [<*IP address*>] Displays the BGP routing table information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > Routing Table
info routing -gateway [<*IP address*>] Displays the Gateway information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > Gateway Information
info routing -igmp [<*IP address*>] Displays the IGMP information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > IGMP Information

Command Syntax and Usage

`info routing -igmp_multicast` [*<IP address>*]

Displays the Multicast Router information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > Multicast Router Information

`info routing -interface` [*<IP address>*]

Displays the Interface information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > Interface Information

`info routing -ip_addr` [*<IP address>*]

Displays the IP address information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > IP Address Information

`info routing -ospf_area` [*<IP address>*]

Displays the OSPF Area information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Information

`info routing -ospf_ext_lsdb` [*<IP address>*]

Displays the OSPF External Link State information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF External Link State Information

Command Syntax and Usage

`info routing -ospf_intf` [<*IP address*>]

Displays the OSPF interface information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Interface Information

`info routing -ospf_lsdb` [<*IP address*>]

Displays the OSPF Link-State DB information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Link-State DB Information

`info routing -ospf_neigh_intf` [<*IP address*>]

Displays the OSPF Neighbor interface information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Neighbor Interface Information

`info routing -ospf_route` [<*IP address*>]

Displays the OSPF route information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Routes Information

`info routing -ospf_stats2` [<*IP address*>]

Displays the OSPF Stats2 information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Stats2 Information

Command Syntax and Usage

info routing -ospf_summ_range [<*IP address*>]

Displays the OSPF Summary Range information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Summary Range Information

info routing -ospf_virt_intf [<*IP address*>]

Displays the OSPF Virtual Interface information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Virtual Interface Information

info routing -rip_route [<*IP address*>]

Displays the RIP Router information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > RIP Route Information

info routing -routes [<*IP address*>]

Displays the Routes information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > Routes

info routing -routes_std [<*IP address*>]

Displays the Routes standard information of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > Routes Standard

Command Syntax and Usage
info routing -tcp [<*IP address*>] Displays the TCP connections information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > TCP Connections
info routing -udp [<*IP address*>] Displays the UDP information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Routing > UDP Information

info switch

Command Syntax and Usage
info switch Displays the usage information.
info switch -trunk [<*IP address*>] Displays the Trunk Group information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Port > Trunk Group Information
info switch -ufd [<*IP address*>] Displays the UFD information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Port > UFD Information

info virtual_routing

Command Syntax and Usage
info virtual_routing Displays the usage information.
info virtual_routing -state [<*IP address*>] Displays the Virtual Routing State information of the given switch. **Note:** If the IP address is not specified, the system will prompt you for it. **SNSC UI Equivalent:** {Device Console} > Monitor > Port > Virtual Routing State Information

firmware apply

Command Syntax and Usage
firmware apply Displays the usage information.
firmware apply -ip <*IP address*> Issues `apply` on the given switch. **SNSC UI Equivalent:** Device > Actions > Apply
firmware apply -domain <*name*> Issues `apply` on all switches contained in that domain. The domain refers to the groups/domains created in Switch Center UI. **SNSC UI Equivalent:** Group Operations > Group Actions > Apply
firmware apply -list <*IP addresses list*> Issues `apply` on all switches in the list of IP Addresses, specified in comma separated value (CSV) format. **SNSC UI Equivalent:** Group Operations > Group Actions > Apply

firmware backup

Command Syntax and Usage

firmware backup

Displays the usage information.

firmware backup -ip *<IP address>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-image** {**image1**|**image2**|**boot**}
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Transfers (saves) the specified firmware from the switch to the FTP/SFTP/TFTP server.

The default image backup file stored on FTP/SFTP/TFTP server is *<IP Address>*_ddMMMyyyy_HHmmss.img. For example, the image backed up from the switch at IP address 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named 192.168.1.1_07Mar2008_235901.img.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) The firmware to backup (image1, image2 or boot)

(ii) FTP/SFTP/TFTP host address

(iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iv) Timeout value (if not specified, the default value is used).

(v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Backup

Command Syntax and Usage

firmware backup -domain *<name>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-image** {**image1**|**image2**|**boot**}
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Transfers (saves) the specified firmware from the switches listed in the domain to the FTP/SFTP/TFTP server. The domain refers to the groups/domains created in Switch Center UI.

The default image backup file stored on FTP/SFTP/TFTP server is *<IP Address>*`_ddMMMyyyy_HHmmss.img`. For example, the image backed up from the switch at IP address 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named `192.168.1.1_07Mar2008_235901.img`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) The firmware to backup (image1, image2 or boot)

(ii) FTP/SFTP/TFTP host address

(iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iv) Timeout value (if not specified, the default value is used).

(v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Backup

Command Syntax and Usage

firmware backup -list *<IP addresses as comma separate values>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-image** {**image1**|**image2**|**boot**}
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Transfers (saves) the specified firmware from the list of switches to the FTP/SFTP/TFTP server.

The default image backup file stored on FTP/SFTP/TFTP server is *<IP Address>_ddMMMyyyy_HHmmss*`.img`. For example, the image backed up from the switch at IP address 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named `192.168.1.1_07Mar2008_235901.img`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) The firmware to backup (image1, image2 or boot)

(ii) FTP/SFTP/TFTP host address

(iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iv) Timeout value (if not specified, the default value is used).

(v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Backup

firmware conf_backup

Command Syntax and Usage

firmware conf_backup

Displays the usage information.

firmware conf_backup -ip *<IP address>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Transfers (saves) the switch configuration from the switch to the FTP/SFTP/TFTP server.

The configuration file that you backed up is stored on an FTP, TFTP, or SFTP server. The default naming convention of the back-up file is `config_`*<IP Address>*`_ddMMMyyyy_HHmmss.txt`. For example, the configuration backed up from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `config_192.168.1.1_07Mar2008_235901.txt`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iii) Timeout value (if not specified, the default value is used).

(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Backup

Command Syntax and Usage

firmware conf_backup -domain *<name>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Transfers (saves) the switch configuration of the switches listed in the domain to the FTP/SFTP/TFTP server. The domain refers to the groups/domains created in Switch Center UI.

The configuration file that you backed up is stored on an FTP, TFTP, or SFTP server. The default naming convention of the back-up file is `config_`*<IP Address>*`_`*ddMMMyyyy_HHmmss*`.txt`. For example, the configuration backed up from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `config_192.168.1.1_07Mar2008_235901.txt`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iii) Timeout value (if not specified, the default value is used).

(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Backup

Command Syntax and Usage

firmware conf_backup -list *<IP addresses as comma separate values>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Transfers (saves) the switch configuration from the list of switches to the FTP/SFTP/TFTP server.

The configuration file that you backed up is stored on an FTP, TFTP, or SFTP server. The default naming convention of the back-up file is `config_`*<IP Address>*`_ddMMMyyyy_HHmmss.txt`. For example, the configuration backed up from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `config_192.168.1.1_07Mar2008_235901.txt`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iii) Timeout value (if not specified, the default value is used).

(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Backup

firmware conf_upload

Command Syntax and Usage

firmware conf_upload

Displays the usage information.

firmware conf_upload -ip *<IP address>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-file_name** *<name of the config file to upload>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Uploads the given config file from the specified FTP/SFTP/TFTP server to the given switch.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) The name of the config file to upload

(iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iv) Timeout value (if not specified, the default value is used).

(v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Upgrade

Command Syntax and Usage

firmware conf_upload -domain *<name>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-file_name** *<name of the config file to upload>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Uploads the given config file from the specified FTP/SFTP/TFTP server to the switches listed in the domain. The domain refers to the groups/domains created in Switch Center UI.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) The name of the config file to upload

(iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iv) Timeout value (if not specified, the default value is used).

(v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Upgrade

Command Syntax and Usage

firmware conf_upload -list *<IP addresses as comma separate values>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-file_name** *<name of the config file to upload>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Uploads the given config file from the specified FTP/SFTP/TFTP server to the listed switches.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) The name of the config file to upload

(iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iv) Timeout value (if not specified, the default value is used).

(v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Upgrade

firmware config_dump

Command Syntax and Usage
firmware config_dump
Displays the usage information.
firmware config_dump -ip *<IP address>*
Dumps the current configuration of the given switch on to the screen. **SNSC UI Equivalent:** Device > Actions > Config Dump

firmware diff_config

Command Syntax and Usage
firmware diff_config
Displays the usage information.
firmware diff_config -ip *<IP address>*
Displays the pending configuration information on the given switch. **SNSC UI Equivalent:** Device > Actions > Diff Config

firmware diff_flash

Command Syntax and Usage
firmware diff_flash
Displays the usage information.
firmware diff_flash -ip *<IP address>*
Displays the unsaved configuration information on the given switch. **SNSC UI Equivalent:** Device > Actions > Diff Flash

firmware panicdump

Command Syntax and Usage

`firmware panic_dump`

Displays the usage information.

`firmware panic_dump -ip` *<IP address>*
[**`-host`** *<FTP/SFTP/TFTP Server address>*]
[**`-user`** *<FTP username>*]
[**`-password`** *<FTP password>*]
[**`-port`** {**`data`**|**`mgt`**|**`ext`**}]
[**`-timeout`** *<value>*]

Downloads the panic dump, if any, from the given switch and saves it on the specified FTP/SFTP/TFTP server.

The panic dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `panicdump_`*<IP Address>*`_ddMMMyyyy_HHmmss`. For example, the panic dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `panicdump_192.168.1.1_07Mar2008_235901`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iii) Timeout value (if not specified, the default value is used).

(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Panic Dump

Command Syntax and Usage

firmware panic_dump -domain *<name>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Downloads the panic dump, if any, from all the switches listed in the domain and saves them on the specified FTP/SFTP/TFTP server. The domain refers to the groups/domains created in Switch Center UI.

The panic dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `panicdump_`*<IP Address>*`_`*ddMMMyyyy_HHmmss*. For example, the panic dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `panicdump_192.168.1.1_07Mar2008_235901`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iii) Timeout value (if not specified, the default value is used).

(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Panic Dump

Command Syntax and Usage

firmware panic_dump -list *<IP addresses as comma separate values>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Downloads the panic dump, if any, from given list of switches and saves them on the specified FTP/SFTP/TFTP server.

The panic dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `panicdump_`*<IP Address>*`_ddMMMyyyy_HHmmss`. For example, the panic dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `panicdump_192.168.1.1_07Mar2008_235901`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iii) Timeout value (if not specified, the default value is used).

(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Panic Dump

firmware reset

Command Syntax and Usage
firmware reset Displays the usage information.
firmware reset -ip <*IP address*> [**-timeout** <*value*>] Resets (reboots) the specified switch. **Note:** If timeout is not specified, the CLI prompts you to specify the timeout or use the default. **SNSC UI Equivalent:** Device > Actions > Reboot Switch
firmware reset -domain <*name*> [**-timeout** <*value*>] Resets (reboots) all the switches that are listed in the domain. The domain refers to the groups/domains created in Switch Center UI. **Note:** If timeout is not specified, the CLI prompts you to specify the timeout or use the default. **SNSC UI Equivalent:** Group Operations > Group Actions > Reboot Switch
firmware reset -list <*IP addresses as comma separate values*> [**-timeout** <*value*>] Resets (reboots) the given list of switches. **Note:** If timeout is not specified, the CLI prompts you to specify the timeout or use the default. **SNSC UI Equivalent:** Group Operations > Group Actions > Reboot Switch

firmware save

Command Syntax and Usage
`firmware save` Displays the usage information.
`firmware save -ip` *<IP address>* Saves the current configuration changes to the Flash memory on the given switch. **SNSC UI Equivalent:** Device > Actions > Save
`firmware save -domain` *<name>* Saves the current configuration changes to the Flash memory on all the switches listed in the specified domain. The domain refers to the groups/domains created in Switch Center UI. **SNSC UI Equivalent:** Group Operations > Group Actions > Save
`firmware save -list` *<IP addresses as comma separate values>* Saves the current configuration changes to the Flash memory on the given list of switches. **SNSC UI Equivalent:** Group Operations > Group Actions > Save

firmware tsdump

Command Syntax and Usage

`firmware tsdump`

Displays the usage information.

`firmware tsdump -ip` *<IP address>*
[**`-host`** *<FTP/SFTP/TFTP Server address>*]
[**`-user`** *<FTP username>*]
[**`-password`** *<FTP password>*]
[**`-port`** {**`data`**|**`mgt`**|**`ext`**}]
[**`-timeout`** *<value>*]

Generates the tech support dump on the given switch and saves it on the specified FTP/SFTP/TFTP server.

The tech support dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `tsdump_`*<IP Address>*`_ddMMMyyyy_HHmmss`. For example, the tech support dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `tsdump_192.168.1.1_07Mar2008_235901`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iii) Timeout value (if not specified, the default value is used).

(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Tech Support Dump

Command Syntax and Usage

firmware tsdump -domain *<name>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Generates the tech support dump on all the switches listed in the domain and saves them on the specified FTP/SFTP/TFTP server. The domain refers to the groups/domains created in Switch Center UI.

The tech support dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `tsdump_`*<IP Address>*`_`*ddMMMyyyy_HHmmss*. For example, the tech support dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `tsdump_192.168.1.1_07Mar2008_235901`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iii) Timeout value (if not specified, the default value is used).

(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Tech Support Dump

Command Syntax and Usage

firmware tsdump -list *<IP addresses as comma separate values>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Generates the tech support dump on the listed switches and saves them on the specified FTP/SFTP/TFTP server.

The tech support dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `tsdump_`*<IP Address>*`_ddMMMyyyy_HHmmss`. For example, the tech support dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `tsdump_192.168.1.1_07Mar2008_235901`.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) FTP/SFTP/TFTP host address

(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(iii) Timeout value (if not specified, the default value is used).

(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Tech Support Dump

firmware upload

Command Syntax and Usage

firmware upload

Displays the usage information.

firmware upload -ip *<IP address>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-file_name** *<firmware file to upload>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Uploads the firmware from the specified FTP/SFTP/TFTP server to the given switch.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) Switch software image slot to use (image1, image2 or boot)

(ii) FTP/SFTP/TFTP host address

(iii) The firmware file to upload

(iv) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(v) Timeout value (if not specified, the default value is used).

(vi) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Upgrade

Command Syntax and Usage

firmware upload -domain *<name>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-file_name** *<firmware file to upload>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Uploads the firmware from the specified FTP/SFTP/TFTP server to the switches listed in the domain. The domain refers to the groups/domains created in Switch Center UI.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) Switch software image slot to use (image1, image2 or boot)

(ii) FTP/SFTP/TFTP host address

(iii) The firmware file to upload

(iv) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(v) Timeout value (if not specified, the default value is used).

(vi) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Upgrade

Command Syntax and Usage

firmware upload -list *<IP addresses as comma separate values>*
[**-host** *<FTP/SFTP/TFTP Server address>*]
[**-file_name** *<firmware file to upload>*]
[**-user** *<FTP username>*]
[**-password** *<FTP password>*]
[**-port** {**data**|**mgt**|**ext**}]
[**-timeout** *<value>*]

Uploads the firmware from the specified FTP/SFTP/TFTP server to the listed switches.

Notes:

If not supplied in the command input, the system prompts you to specify the following:

(i) Switch software image slot to use (image1, image2 or boot)

(ii) FTP/SFTP/TFTP host address

(iii) The firmware file to upload

(iv) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).

(v) Timeout value (if not specified, the default value is used).

(vi) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Upgrade

data backup

Command Syntax and Usage

`maint databackup -path` *<directory>*

Backs up Switch Center's critical data in the given directory.

Switch Center uses the standard ZIP format to compress the contents in backup file. The backup file is named as follows:
`SNSC_`*<version>*`_`*<date>*`_`*<time>*`.zip`

Where:

<version> is the Switch Center version in a.b.c.d format,

<date> is the date on the Switch Center server system in **yyyymmdd** format, on which the backup operation was initiated

<time> is the time on the Switch Center server system in **HHMMSS** format, at which the backup operation was initiated.

For example, if the backup operation is initiated in Switch Center 5.2.1.0 on 23rd July 2010 at 14:01:43 hrs, the backup file is named as follows:
`SNSC_5.2.1.0_20100723_140143.zip`

SNSC UI Equivalent: Maintenance > Data Backup > Take Data Backup

support dump

Command Syntax and Usage

maint supportdump [-include_db] -path *<directory>*

Saves the Switch Center's support dump in the given repository. If `-include_db` is specified, the database will also get included in the support dump.

The support dump file is named as follows:
`SNSC_SupportDump_`*<version>*`_`*<date>*`_`*<time>*`.zip`

Where:

<version> is the Switch Center version in a.b.c.d format,

<date> is the date on the Switch Center server system in **yyyymmdd** format, on which the backup operation was initiated.

<time> is the time on the Switch Center server system in **HHMMSS** format, at which the backup operation was initiated.

For example, if the support dump is initiated in Switch Center 5.2.1.0 on 23rd July 2010 at 14:01:43 hrs, the support dump file is named as follows:
`SNSC_SupportDump_5.2.1.0_20100723_140143.zip`

SNSC UI Equivalent: Maintenance > Data Backup > SNSC Support Dump

Appendix A: Externally Launching IBM Switch Center

Switch Center (SNSC) can be launched from an external application using a specialized URL, which allows you to specify additional parameters such as device IP address and a specific page of Switch Center.

The specialized URL is in the following form:

- **HTTP**
  `http://`<*SNSC system*>`:40080/snsc/jsp/Launch.jsp?ipaddress=`<*address*>`&sysname=`<*string*>`&pageid=`<*id*>
- **HTTPS**
  `https://`<*SNSC system*>`:40443/snsc/jsp/Launch.jsp?ipaddress=`<*address*>`&sysname=`<*string*>`&pageid=`<*id*>

where

`ipaddress`	The IP address of the switch that is discovered in SNSC, and for which you want to launch the Device Console page.
`sysname`	The sysName of the device. This parameter enables SNSC to search for the discovered device matching the sysName, if for example, a search based on the IP address fails.
`pageid`	Enables you to specify which page SNSC should open when it launches for the specified device.

Note: The additional parameters namely `ipaddress`, `sysname`, and `pageid` are optional. If not specified, Switch Center opens the Summary Page.

List of Page IDs

The following table lists the pageid used for various Monitoring and Configuration pages of Switch Center:

Tab Reference	Page ID
Monitor > Summary > Health Status	mon_sum_hs
Monitor > Summary > Information	mon_sum_inf
Monitor > Summary > Port Status	mon_sum_pstat
Monitor > Summary > Port Summary	mon_sum_psum
Monitor > Summary > Events	mon_sum_ev
Monitor > Summary > Syslog	mon_sum_syslog
Monitor > Switch > Information	mon_sw_inf
Monitor > Switch > SNMP Statistics	mon_sw_snmp
Monitor > Switch > Packet Statistics	mon_sw_pkt
Monitor > Switch > STP Statistics	mon_sw_stpstat
Monitor > Switch > MP CPU Statistics	mon_sw_mpcpustat
Monitor > Switch > UFD Statistics	mon_sw_ufdstat
Monitor > Switch > UFD information	mon_sw_ufdinfo
Monitor > Switch > NTP Statistics	mon_sw_ntpstat
Monitor > Switch > Trunk Groups	mon_sw_trnkgrps
Monitor > Switch > Trunk Group Ports	mon_sw_trnkgrpprts
Monitor > Switch > TACACS Authentication Statistics	mon_sw_tac_auth_stat
Monitor > Ports > Summary	mon_prt_sum
Monitor > Ports > Interface Statistics	mon_prt_ifstat
Monitor > Ports > 802.1x Statistics	mon_prt_8021x
Monitor > Ports > LACP Statistics	mon_prt_lacpstat
Monitor > Ports > LACP Aggregator	mon_prt_lacpagrtor
Monitor > Ports > LACP Port Aggregator	mon_prt_lacpprtagrtor
Monitor > Ports > Bridge Statistics	mon_prt_brdgstat
Monitor > Ports > Ethernet Error Statistics	mon_prt_etherrstat
Monitor > Ports > Transceiver Info	mon_prt_transinfo
Monitor > Ports > IP Statistics	mon_prt_ipstat
Monitor > Ports > Authenticator Diagnostics Statistics	mon_prt_authdiagstat

Monitor > Layer 2 > Bridge > Forwarding Statistics	`mon_brdg_fwdstat`
Monitor > Layer 2 > Bridge > Forwarding Database Information	`mon_brdg_fwddbinfo`
Monitor > Layer 2 > Bridge > Base Port Information	`mon_brdg_bprtinfo`
Monitor > Layer 2 > Bridge > CIST Bridge Information	`mon_brdg_cistbrdginfo`
Monitor > Layer 2 > Bridge > CIST Port Information	`mon_brdg_cistprtinfo`
Monitor > Layer 2 > Bridge > STP	`mon_brdg_stp`
Monitor > Layer 2 > LLDP > LLDP Port Info	`mon_lldp_portinfo`
Monitor > Layer 2 > Failover > General	`mon_failovr_gen`
Monitor > Layer 2 > Failover > Trigger Information	`mon_failovr_trgrinfo`
Monitor > Layer 2 > Failover > Monitor Port Status	`mon_failovr_monprtstat`
Monitor > Layer 2 > Failover > Control Port Status	`mon_failovr_ctrlprt`
Monitor > Layer 2 > Hot Links > Summary	`mon_hotlnk_sum`
Monitor > Layer 2 > Hot Links > Statistics	`mon_hotlnk_stat`
Monitor > Layer 2 > Hot Links > Info	`mon_hotlnk_info`
Monitor > Layer 2 > 802.1x/p > 802.1x/p General	`mon_802_gen`
Monitor > Layer 2 > 802.1x/p > 802.1x/p Priority COSq	`mon_802_pricosq`
Monitor > Layer 2 > 802.1x/p > Port Priority	`mon_802_pprior`
Monitor > Layer 3 > IP > IP Interface Statistics	`mon_ip_ipifstat`
Monitor > Layer 3 > IP > Interface Information	`mon_ip_ifinfo`
Monitor > Layer 3 > IP > TCP Statistics	`mon_ip_tcpstat`
Monitor > Layer 3 > IP > TCP Connections	`mon_ip_tcpcon`
Monitor > Layer 3 > IP > UDP Statistics	`mon_ip_udpstat`
Monitor > Layer 3 > IP > UDP Information	`mon_ip_udpinfo`
Monitor > Layer 3 > IP > IP Statistics	`mon_ip_ipstat`
Monitor > Layer 3 > IP > ICMP In Statistics	`mon_ip_icmpinstat`
Monitor > Layer 3 > IP > ICMP Out Statistics	`mon_ip_icmpoutstat`
Monitor > Layer 3 > IP > DNS Statistics	`mon_ip_dnsstat`
Monitor > Layer 3 > IP > Routes	`mon_ip_routes`
Monitor > Layer 3 > IP > Routes Standard	`mon_ip_routesstd`
Monitor > Layer 3 > IP > Route Statistics	`mon_ip_routesstat`
Monitor > Layer 3 > IP > ARP	`mon_ip_arp`
Monitor > Layer 3 > IP > ARP Statistics	`mon_ip_arpstat`
Monitor > Layer 3 > IP > Gateway Information	`mon_ip_gtwinfo`

Monitor > Layer 3 > IP > IP Address Information	mon_ip_ipaddinfo
Monitor > Layer 3 > BGP > Peers Summary	mon_bgp_peersum
Monitor > Layer 3 > BGP > Routing Table	mon_bgp_routtable
Monitor > Layer 3 > RIP > RIP V2 Statistics	mon_rip_ripstat
Monitor > Layer 3 > RIP > RIP Route Information	mon_rip_riproutinfo
Monitor > Layer 3 > OSPF > General OSPF Statistics	mon_ospf_genospfstat
Monitor > Layer 3 > OSPF > OSPF Area Statistics	mon_ospf_areatstat
Monitor > Layer 3 > OSPF > OSPF Area Neighbor Statistics	mon_ospf_areaneighstat
Monitor > Layer 3 > OSPF > OSPF Area Interface Statistics	mon_ospf_areaifstat
Monitor > Layer 3 > OSPF > OSPF Area Receive Error Statistics	mon_ospf_arearecverrstat
Monitor > Layer 3 > OSPF > OSPF Area Interface Receive Error Statistics	mon_ospf_areaifrecverrstat
Monitor > Layer 3 > OSPF > OSPF Interface Change Statistics	mon_ospf_ifchngstat
Monitor > Layer 3 > OSPF > OSPF Interface Transmission Statistics	mon_ospf_iftransstat
Monitor > Layer 3 > OSPF > OSPF Interface Neighbor Statistics	mon_ospf_ifneighstat
Monitor > Layer 3 > OSPF > OSPF Area Information	mon_ospf_areainfo
Monitor > Layer 3 > OSPF > OSPF Interface Information	mon_ospf_ifinfo
Monitor > Layer 3 > OSPF > OSPF Neighbor Interface Information	mon_ospf_neighifinfo
Monitor > Layer 3 > OSPF > OSPF Virtual Interface Information	mon_ospf_virtifinfo
Monitor > Layer 3 > OSPF > OSPF Stats2 Information	mon_ospf_stat2finfo
Monitor > Layer 3 > OSPF > OSPF Link-State DB Information	mon_ospf_lnkdbinfo
Monitor > Layer 3 > OSPF > OSPF External Link-State DB Information	mon_ospf_extlnkdbinfo
Monitor > Layer 3 > OSPF > OSPF Summary Range Information	mon_ospf_sumrnginfo
Monitor > Layer 3 > OSPF > OSPF Routes Information	mon_ospf_routesinfo
Monitor > Layer 3 > IGMP > IGMP Information	mon_igmp_info
Monitor > Layer 3 > IGMP > Multicast Router Information	mon_igmp_multirouteinfo
Monitor > Layer 3 > IGMP > IGMP Snooping Statistics	mon_igmp_snoopstat

Monitor > Layer 3 > Virtual Routing > Virtual Routing	mon_vr_virtrouting
Monitor > Layer 3 > Virtual Routing > Virtual Routing State	mon_vr_virtroutingstate
Monitor > Access Control List > ACL Statistics	mon_acl_aclstat
Monitor > Access Control List > MAC ACL Statistics	mon_acl_macaclstat
Monitor > Access Control List > IP ACL Statistics	mon_acl_ipaclstat
Monitor > FCoE > FIP Snooping Information	mon_fcoe_fipsnoopinfo
Monitor > FCoE > FIP Snooping Statistics	mon_fcoe_fipsnoopstat
Monitor > Virtualization > VMReady Port Info	mon_virt_vmreadyportinfo
Monitor > Virtualization > VMReady VM Info	mon_virt_vmreadyvminfo
Monitor > EVB > VDP TLV Info	mon_evb_vdptlvinfo
Monitor > EVB > VSI Information	mon_evb_vsiinfo
Monitor > EVB > ECP Channel Info	mon_evb_ecbchannelinfo
Monitor > EVB > EVB Local Info	mon_evb_evblocalinfo
Monitor > EVB > EVB Remote Info	mon_evb_evbremoteinfo
Monitor > EVB > VM Info	mon_evb_vminfo
Monitor > EVB > VSI DB Info	mon_evb_vsidbinfo
Monitor > EVB > VSI DB ACL Info	mon_evb_vsidbaclinfo
Monitor > iSwitch > Port Information	mon_iswitch_portinfo
Monitor > iSwitch > Host Uplink Information	mon_iswitch_hostuplink_info
Configure > Switch > General	cfg_sw_gen
Configure > Switch > Firmware	cfg_sw_fw
Configure > Switch > Syslog Hosts	cfg_sw_syshost
Configure > Switch > Trap Settings	cfg_sw_trapsettings
Configure > Switch > RADIUS Server	cfg_sw_radserv
Configure > Switch > RADIUS General	cfg_sw_radgen
Configure > Switch > TACACS Server	cfg_sw_tacacserv
Configure > Switch > TACACS - User Map	cfg_sw_tacacusrmap
Configure > Switch > TACACS General	cfg_sw_tacacsgen
Configure > Switch > TACACS Command Auth	cfg_sw_tacacscmdauth
Configure > Switch > NTP Service	cfg_sw_ntpservc
Configure > Switch > Management Network	cfg_sw_mgmtntwrk
Configure > Switch > Port Mirroring	cfg_sw_portmirr
Configure > Switch > System Trap Settings	cfg_sw_systrapsettings

Configure > Config/Image/Dump Control > Config/Image/ Dump Control	`cfg_cfgimgdumpctrl`
Configure > Access User > Access User	`cfg_accessuser`
Configure > Layer 2 > General > General	`cfg_l2_general`
Configure > Layer 2 > Trunk > Trunk Hash	`cfg_l2_trnk_hash`
Configure > Layer 2 > Trunk > Trunk Groups	`cfg_l2_trnk_grps`
Configure > Layer 2 > LACP > LACP General	`cfg_l2_lacp_gen`
Configure > Layer 2 > LACP > LACP Ports	`cfg_l2_lacp_ports`
Configure > Layer 2 > 802.1x > General	`cfg_l2_8021x_gen`
Configure > Layer 2 > 802.1x > Global	`cfg_l2_8021x_global`
Configure > Layer 2 > 802.1x > Guest VLAN	`cfg_l2_8021x_guestvlan`
Configure > Layer 2 > 802.1x > Ports	`cfg_l2_8021x_ports`
Configure > Layer 2 > MSTP/RSTP > MSTP	`cfg_l2_mstprstp_mstp`
Configure > Layer 2 > CIST > CIST Bridge	`cfg_l2_cist_bridge`
Configure > Layer 2 > CIST > CIST Port	`cfg_l2_cist_ports`
Configure > Layer 2 > Spanning Tree Protocol > STP Groups	`cfg_l2_stp_grps`
Configure > Layer 2 > Spanning Tree Protocol > STP Port	`cfg_l2_stp_ports`
Configure > Layer 2 > Spanning Tree Protocol > Spanning Tree	`cfg_l2_stp_tree`
Configure > Layer 2 > Forwarding Database > FDB General	`cfg_l2_fdb_gen`
Configure > Layer 2 > Forwarding Database > FDB Static	`cfg_l2_fdb_static`
Configure > Layer 2 > Forwarding Database > Static Multicast	`cfg_l2_fdb_mcast`
Configure > Layer 2 > VLAG > General	`cfg_l2_vlag_gen`
Configure > Layer 2 > VLAG > Trunk	`cfg_l2_vlag_trunk`
Configure > Layer 2 > VLAG > LACP	`cfg_l2_vlag_lacp`
Configure > Layer 2 > VLAG > ISL	`cfg_l2_vlag_isl`
Configure > Layer 2 > Hot Links > General Configuration	`cfg_l2_hl_gencfg`
Configure > Layer 2 > Hot Links > Triggers	`cfg_l2_hl_triggers`
Configure > Layer 2 > Virtual LANs > VLAN Memberships	`cfg_l2_virtlans_vlanmem`
Configure > Layer 2 > Virtual LANs > VMAP for Non Server Ports	`cfg_l2_virtlans_vmap_nonsrvports`
Configure > Layer 2 > Virtual LANs > VMAP for Server Ports	`cfg_l2_virtlans_vmap_srvports`

Configure > Layer 2 > Virtual LANs > VMAP for All Ports	`cfg_l2_virtlans_vmapallports`
Configure > Layer 2 > Virtual LANs > Private Vlan	`cfg_l2_virtlans_privlan`
Configure > Layer 2 > Virtual LANs > Protocol Vlan	`cfg_l2_virtlans_protovlan`
Configure > Layer 2 > LLDP > General	`cfg_l2_lldp_gen`
Configure > Layer 2 > LLDP > LLDP Port	`cfg_l2_lldp_ports`
Configure > Layer 2 > AMP > General	`cfg_l2_amp_gen`
Configure > Layer 2 > AMP > Group	`cfg_l2_amp_group`
Configure > Layer 3 > IP > Interfaces	`cfg_l3_if`
Configure > Layer 3 > IP > Forwarding	`cfg_l3_ip_fwd`
Configure > Layer 3 > IP > Network Filters	`cfg_l3_ip_nwf`
Configure > Layer 3 > IP > Loopback Interfaces	`cfg_l3_ip_loopbackif`
Configure > Layer 3 > IP > Static ARP	`cfg_l3_ip_statarp`
Configure > Layer 3 > Gateways > Gateways	`cfg_l3_gw`
Configure > Layer 3 > ARP > ARP	`cfg_l3_arp`
Configure > Layer 3 > OSPF > General	`cfg_l3_ospf_gen`
Configure > Layer 3 > OSPF > Areas	`cfg_l3_ospf_area`
Configure > Layer 3 > OSPF > Interfaces	`cfg_l3_ospf_if`
Configure > Layer 3 > OSPF > Summary Ranges	`cfg_l3_ospf_sumrange`
Configure > Layer 3 > OSPF > Virtual Interfaces	`cfg_l3_ospf_virtif`
Configure > Layer 3 > OSPF > Host Table	`cfg_l3_ospf_hosttab`
Configure > Layer 3 > OSPF > MD5 Key	`cfg_l3_ospf_md5key`
Configure > Layer 3 > OSPF > Loopback Interface	`cfg_l3_ospf_loopbackif`
Configure > Layer 3 > OSPF > Static Routes	`cfg_l3_ospf_staticroute`
Configure > Layer 3 > OSPF > Fixed Routes	`cfg_l3_ospf_fixedroute`
Configure > Layer 3 > OSPF > RIP	`cfg_l3_ospf_rip`
Configure > Layer 3 > OSPF > BGP External Route Redistribute	`cfg_l3_ospf_bgpext`
Configure > Layer 3 > OSPF > BGP Internal Route Redistribute	`cfg_l3_ospf_bgpint`
Configure > Layer 3 > VRRP > General	`cfg_l3_vrrp_gen`
Configure > Layer 3 > VRRP > Virtual Router	`cfg_l3_vrrp_virtrouter`
Configure > Layer 3 > VRRP > Virtual Interface	`cfg_l3_vrrp_virtif`
Configure > Layer 3 > VRRP > Virtual Router Group	`cfg_l3_vrrp_virtroutegrp`

Configure > Layer 3 > DHCP > Snooping	`cfg_l3_dhcp_snooping`
Configure > Layer 3 > DHCP > Snooping VLAN	`cfg_l3_dhcp_snoopingvlan`
Configure > Layer 3 > Flooding > Flooding	`cfg_l3_flooding`
Configure > Ports > Ports	`cfg_ports`
Configure > Ports > Ports General	`cfg_ports_gen`
Configure > Ports > Threshold Rate	`cfg_ports_threshold`
Configure > Ports > Gigabit Link	`cfg_ports_gigabitlink`
Configure > Ports > UDLD	`cfg_ports_udld`
Configure > Ports > OAM	`cfg_ports_oam`
Configure > Ports > ACL/QOS	`cfg_ports_aclqos`
Configure > Ports > STP	`cfg_ports_stp`
Configure > Ports > Port Priority	`cfg_ports_priority`
Configure > Ports > DHCP Snooping	`cfg_ports_dhcpsnooping`
Configure > Access Control List > ACL	`cfg_acl`
Configure > Access Control List > ACL Groups	`cfg_acl_aclgrps`
Configure > Access Control List > VMAP	`cfg_acl_vmap`
Configure > Access Control List > Log	`cfg_acl_log`
Configure > Access Control List > MAC ACL	`cfg_acl_mac`
Configure > Access Control List > IP ACL	`cfg_acl_ip`
Configure > CEE > General	`cfg_cee_gen`
Configure > CEE > Priority Allocation	`cfg_cee_prioalloc`
Configure > CEE > Bandwidth Allocation	`cfg_cee_bwalloc`
Configure > CEE > PFC	`cfg_cee_pfc`
Configure > CEE > PFC Status	`cfg_cee_pfcstatus`
Configure > CEE > Port PFC	`cfg_cee_portpfc`
Configure > CEE > Port PFC Status	`cfg_cee_portpfcstatus`
Configure > CEE > DCBX	`cfg_cee_dcbx`
Configure > FCoE > FIP Snooping	`cfg_fcoe_fipsnoop`
Configure > FCoE > FIP Snooping Port	`cfg_fcoe_fipsnoopport`
Configure > Virtualization > VMready > General	`cfg_virt_vmready_gen`
Configure > Virtualization > VMready > VMware vCenter Access	`cfg_virt_vmready_vmvcntraccess`
Configure > Virtualization > VMready > Profiles	`cfg_virt_vmready_profiles`
Configure > Virtualization > VMready > Groups	`cfg_virt_vmready_grps`

Configure > Virtualization > VMready > Bandwidth	`cfg_virt_vmready_bw`
Configure > Virtualization > VMready > Ports	`cfg_virt_vmready_ports`
Configure > Virtualization > VMready > Virtual Machines	`cfg_virt_vmready_virtmachine`
Configure > Virtualization > VMready > Advanced Pre-Provisioning	`cfg_virt_vmready_advpreprovision`
Configure > vNIC > General	`cfg_vnic_gen`
Configure > vNIC > vNICs	`cfg_vnic_vnics`
Configure > vNIC > vNICs Groups	`cfg_vnic_vnicsgrps`
Configure > EVB > General	`cfg_evb_gen`
Configure > EVB > Profiles	`cfg_evb_prof`
Configure > EVB > VSI DB Host	`cfg_evb_vsidbhost`
Configure > iSwitch > vCenter	`cfg_iswitch_vcenter`
Configure > iSwitch > Virtual Data Station	`cfg_iswitch_vds`
Virtualization Tools > VSI DB Console	`vsi_manager`

Appendix B: Integrating SNSC with IBM Tivoli Network Manager

Switch Center (SNSC) can be integrated with IBM Tivoli Network Manager (ITNM) IP Edition 3.9 and above so that it can be launched from Tivoli Integrated Portal (TIP) GUI. Switch Center supports Launch-In-Context (LIC) and Single Sign-On (SSO) based launch from Tivoli Network Manager. This section describes various steps involved in configuring both Switch Center and Tivoli Network Manager for enabling LIC and SSO of Switch Center from Tivoli Network Manager.

Requirements

- Tivoli Network Manager 3.9 or above installed
- Switch Center 6.1
- Tivoli Network Manager has discovered at least one IBM BLADE switch.

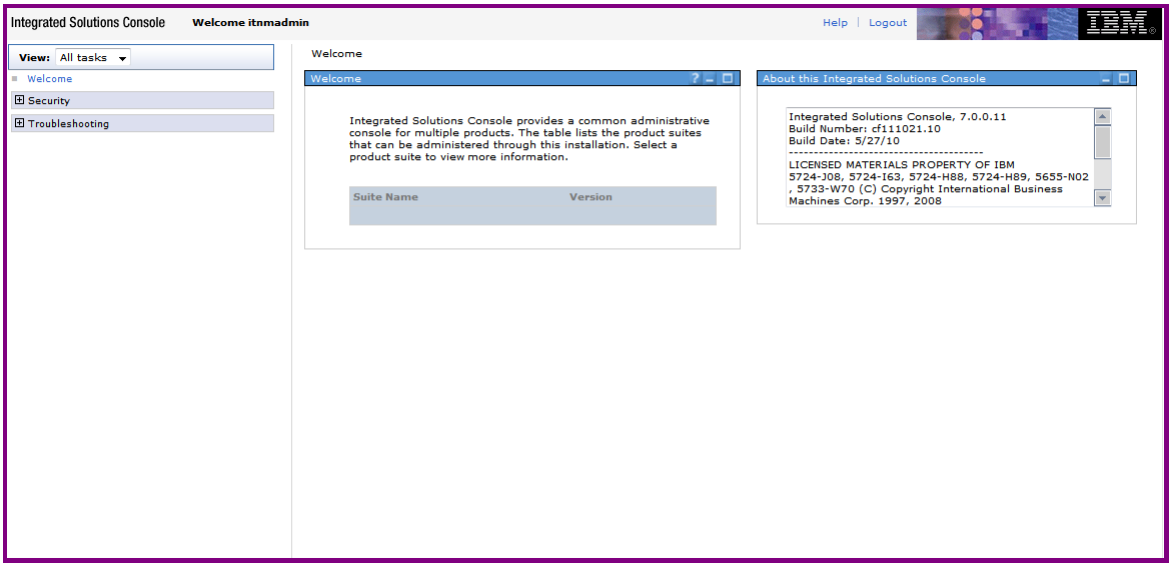
Step 1: Generate Signer Certificate

Switch Center needs Tivoli Network Manager Signer Certificate for creating the key store. This key store is required for single sign-on. The following steps describe signer certificate generation:

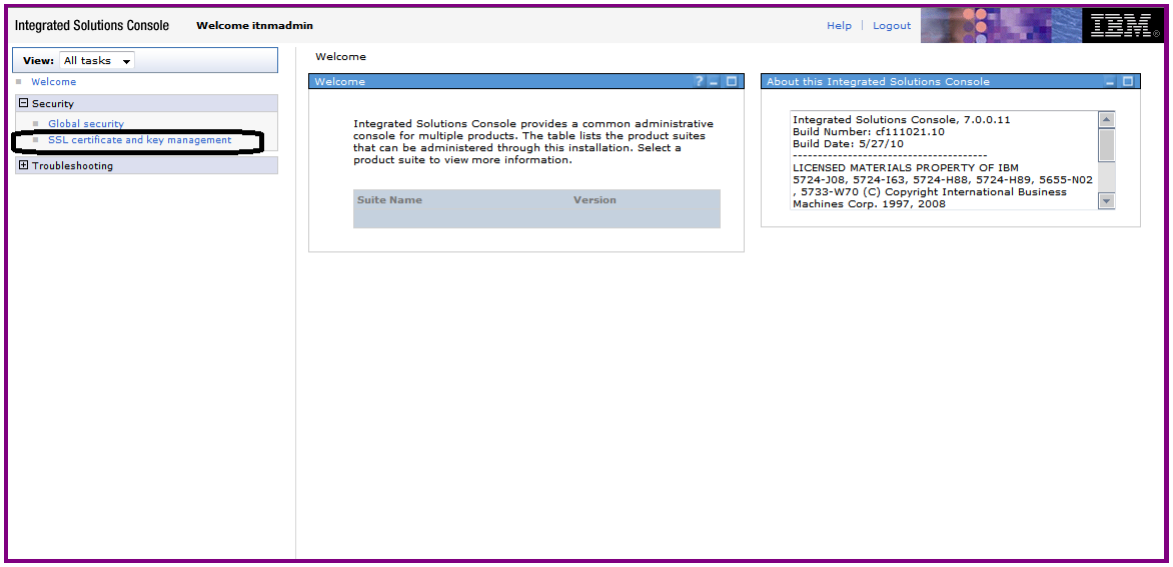
1 Launch Tivoli Network Manager's WebSphere console:

a You can directly launch WebSphere Console (Integrated Solutions Console) using the following URL:
`https://`*<Tivoli Network Manager IP Address>*`: 16316/ibm/console/login.jsp`

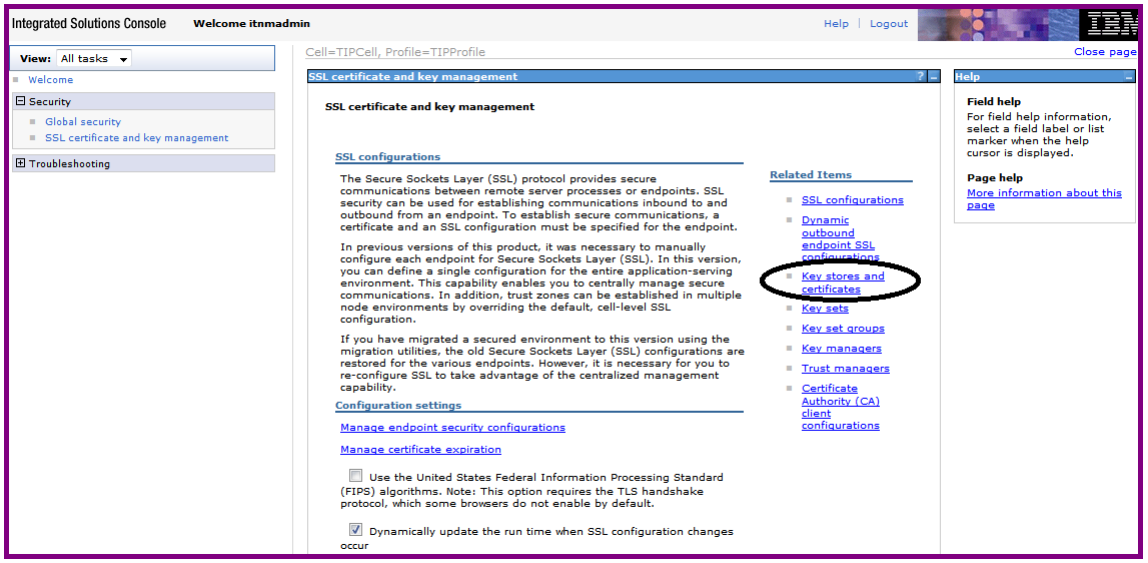
b Alternatively, launch Tivoli Network Manager TIP (`https://`*<Tivoli Network Manager IP Address>*`:16311/ibm/console`) and then select **Settings > WebSphere Administrative Console**.



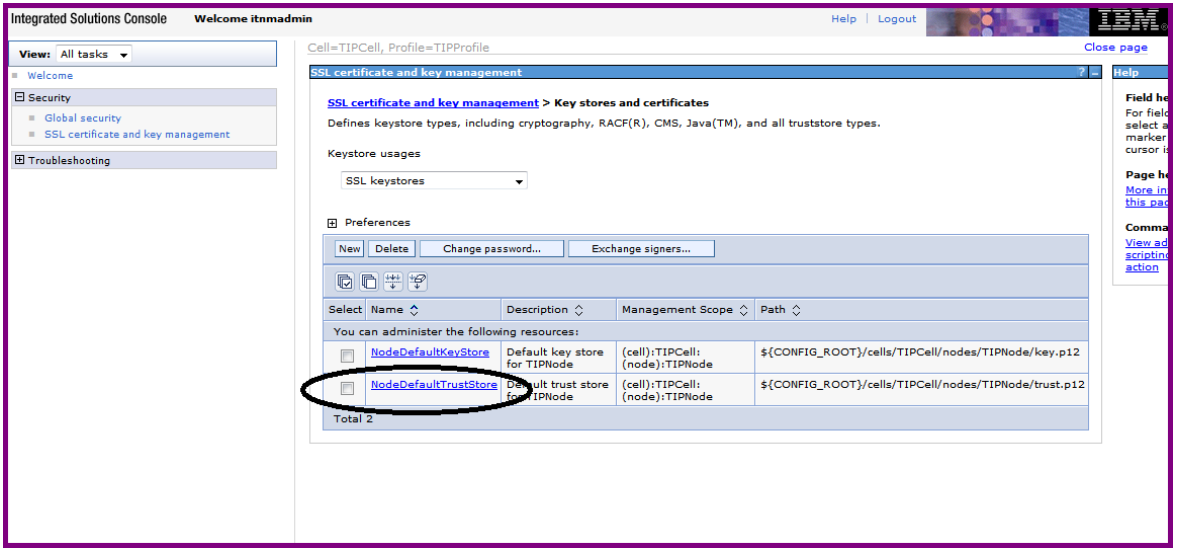
2 On the left pane, select **Security > SSL certificate and key management**.



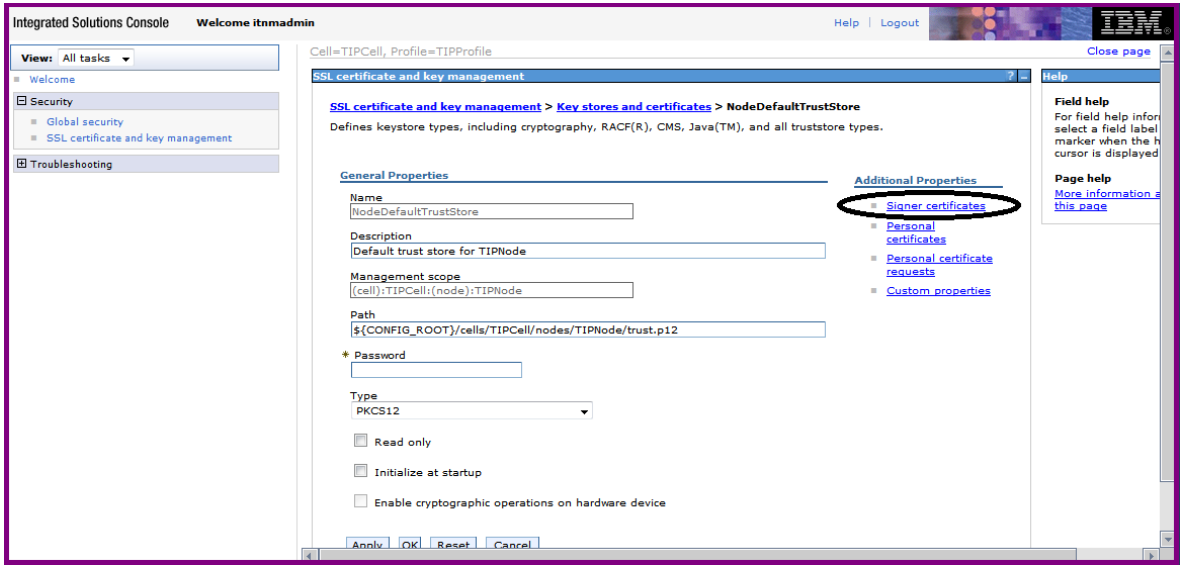
3 Under Releated Items, click **Key stores and certificates**.



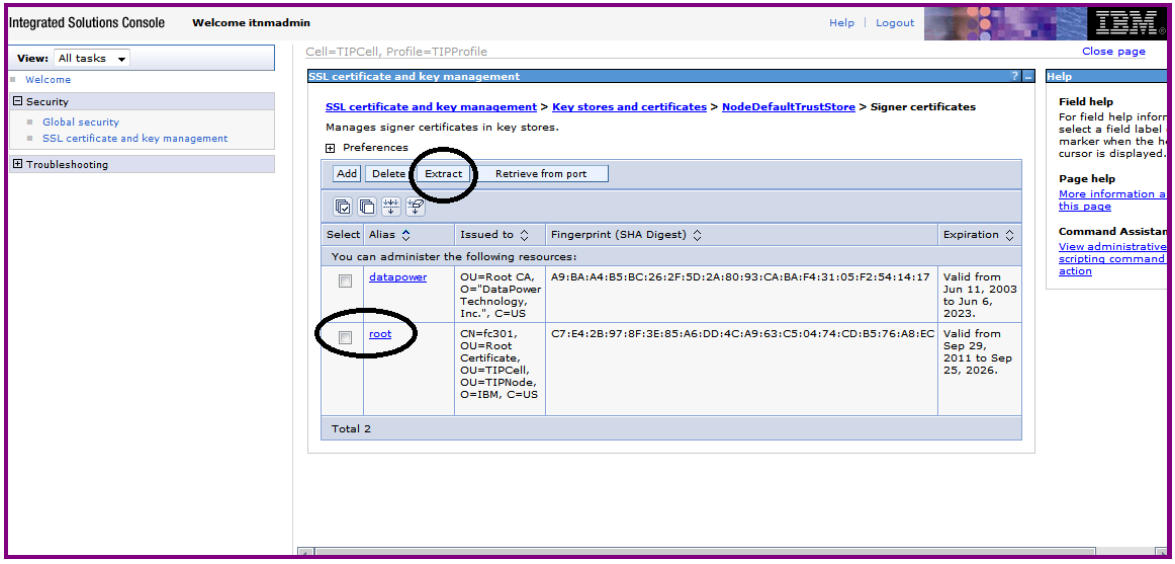
4 Click **NodeDefaultTrustStore**.



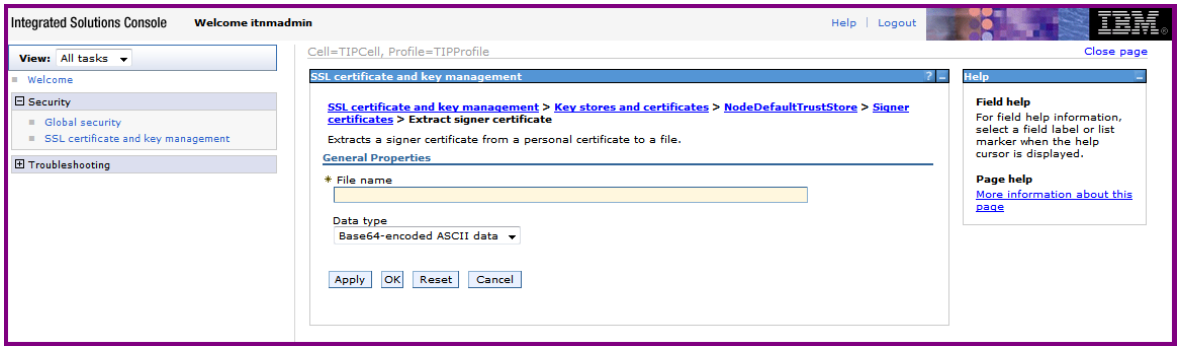
5 Under Additional Properties, click **Signer certificates**.



6 Select the **default** or **root** certificate box, then click **Extract**.



7 In the dialog box, enter a file name for the signer certificate and select the following data type: `Base64-encoded ASCII data`. Click **OK**.



Note: The contents are extracted onto the system where Tivoli Network Manager is running, so the file name should be specific to that system, including the path.

Step 2: Create Key Store

1 Login to the system where Switch Center is installed.

2 Download or copy the Signer certificate file created in "Step 1: Generate Signer Certificate" on page 821 to a directory (for Linux, use `/tmp`). If Switch Center is installed on the same system where Tivoli Network Manager is also installed, then you just have to copy the file.

3 Change the directory to *<installation directory>*`/conf/auth`. For example:
`# cd /opt/ibm/snsc/conf/auth`

4 Create key store using the JRE keytool bundled in Switch Center. Use the following command:
<installation directory>`/j2re/bin/keytool -import -keystore ess_ts.jks –storepass` *<password>* `-file` *<signer certificate file>* `-alias` *<alias>*

Where:

<password>	The password required for protecting the integrity of the keystore.
<signer certificate file>	The file path of the signer certificate file.
<alias>	An alias for the keystore. This should be unique within the trust store. If it is a new file, you may use any name, for example, `default`.

For example, issue the command below to create the keystore with the following parameters:

- signer certificate is `/tmp/signer_cert`
- password is `pass123`
- alias is `default`

```
# /opt/ibm/snsc/j2re/bin/keytool -import –keystore ess_ts.jks -
storepass pass123 -file /tmp/signer_cert -alias default
```

Step 3: Configure Switch Center for LIC & SSO

1. Login as root to Linux system where Switch Center is running.
2. Stop SNSC:
   `# /opt/ibm/snsc/bin/shutdown.sh`
3. Update the following file: `/opt/ibm/snsc/conf/auth/ess_auth.properties`
   Edit the following fields:

`itnm.server.address`	The IP Address of the system where Tivoli Network Manager is installed (example: `itnm.server.address=snsc.foo.net`).
`itnm.server.port`	The port number where Tivoli Network Manager can be accessed (example: `itnm.server.port=16311`).
`snsc.keystore.password`	The password that was used to generate the keystore (example: `snsc.keystore.password=pass123`).
`itnm.ess.username`	The username for accessing the ESS Server. This can be an Tivoli Network Manager login user name (example: `itnm.ess.username=tipadmin`)
`itnm.ess.password`	The password for itnm.ess.username (example: `itnm.ess.password=xxxxx`).

4. Start SNSC:
   `# /opt/ibm/snsc/bin/startup.sh`

Note: Though the passwords are entered in clear text, when Switch Center is restarted, the clear text passwords in the `ess_auth.properties` file are replaced with encrypted passwords.

Step 4: Create Switch Center User Groups in IBM Tivoli Network Manager

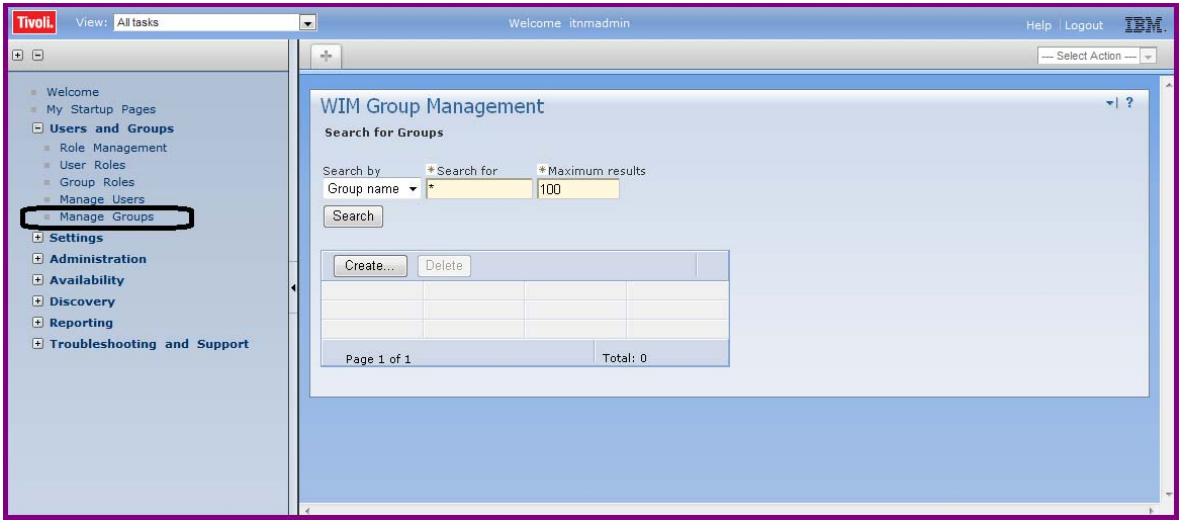
Switch Center uses User Groups information for determining the role (admin, oper, user) associated with a user when the user tries to launch Switch Center from Tivoli Network Manager TIP.

The following list shows the mapping of Switch Center roles with Switch Center User Groups in Tivoli Network Manager:

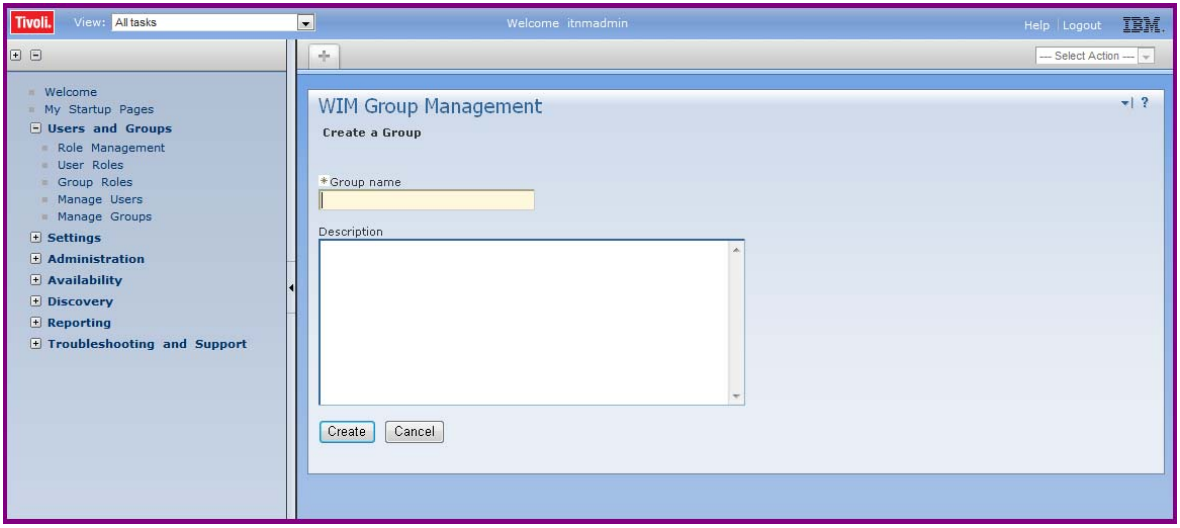
User Groups in Tivoli Network Manager	**SNSC Role**
`snscadmin`	`admin`
`snscoper`	`oper`
`snscuser`	`user`

Use the following steps to create Switch Center User Groups in Tivoli Network Manager:

1. Login to Tivoli Network Manager using an administrative privileged user (for example, `itnmadmin`).
2. Select **Users and Groups > Manage Groups** to open the WIM Group Management window.



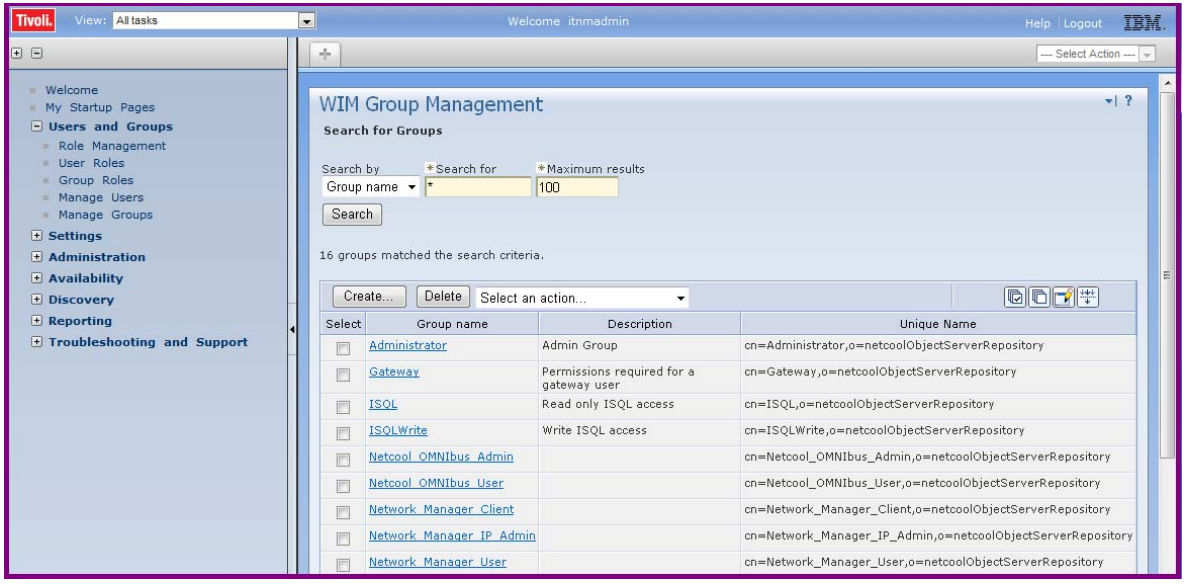
3 Click **Create**… in WIM Group Management panel to open the Group creation dialog.



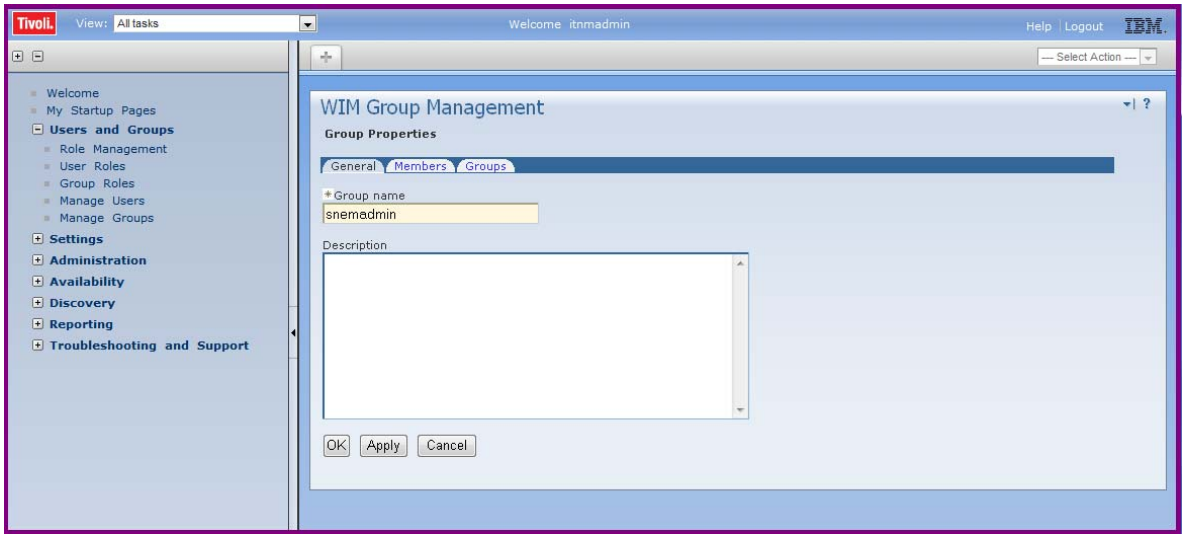
4 Enter the text snscadmin in Group name field and click **Create** to create `snscadmin` User Group.

5 Repeat the above step for the `snscoper` and `snscuser` User Groups.

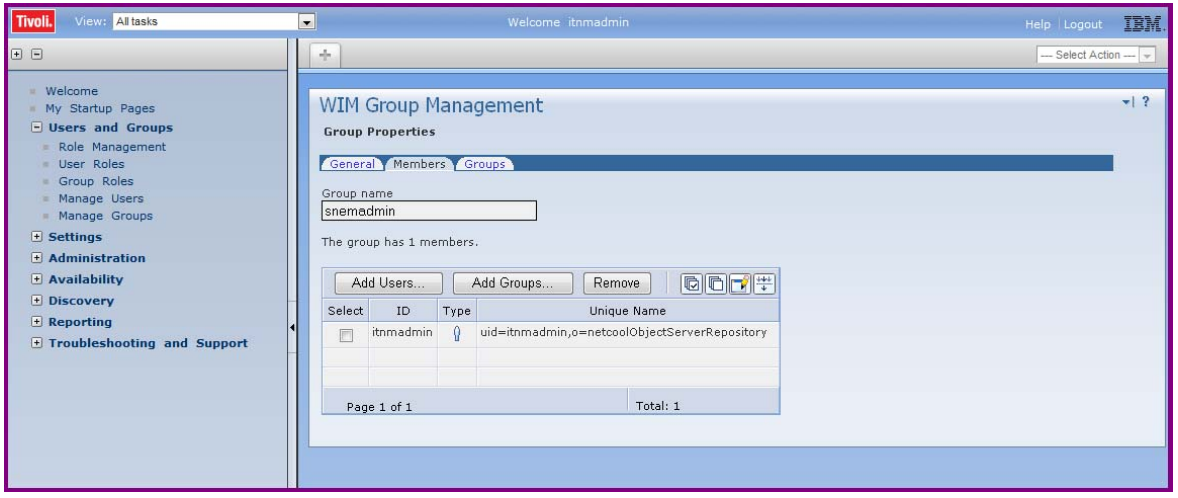
6 Select **Users and Groups > Manage Groups** and click **Search** to list all the configured User Groups.



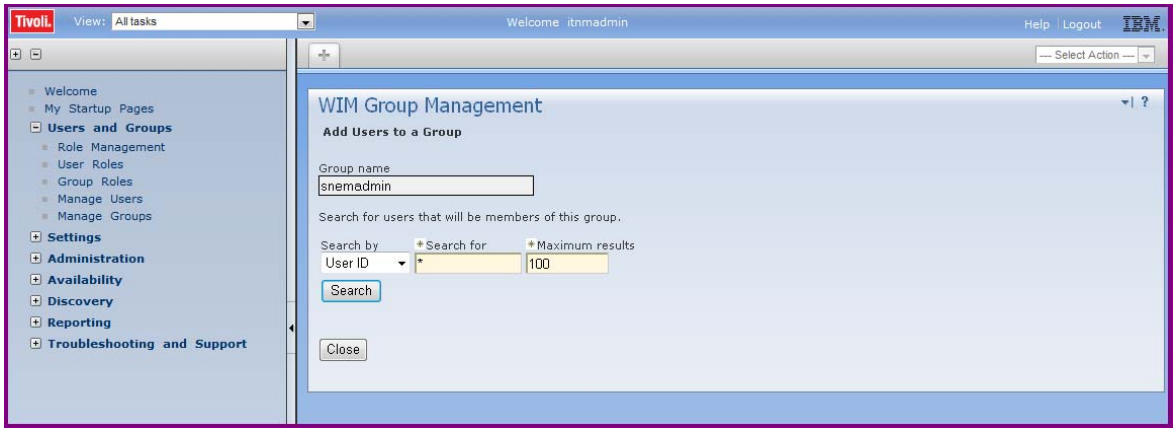
7 Select the snscadmin Group name hyperlink for which you want to add users. The Group Properties dialog opens.



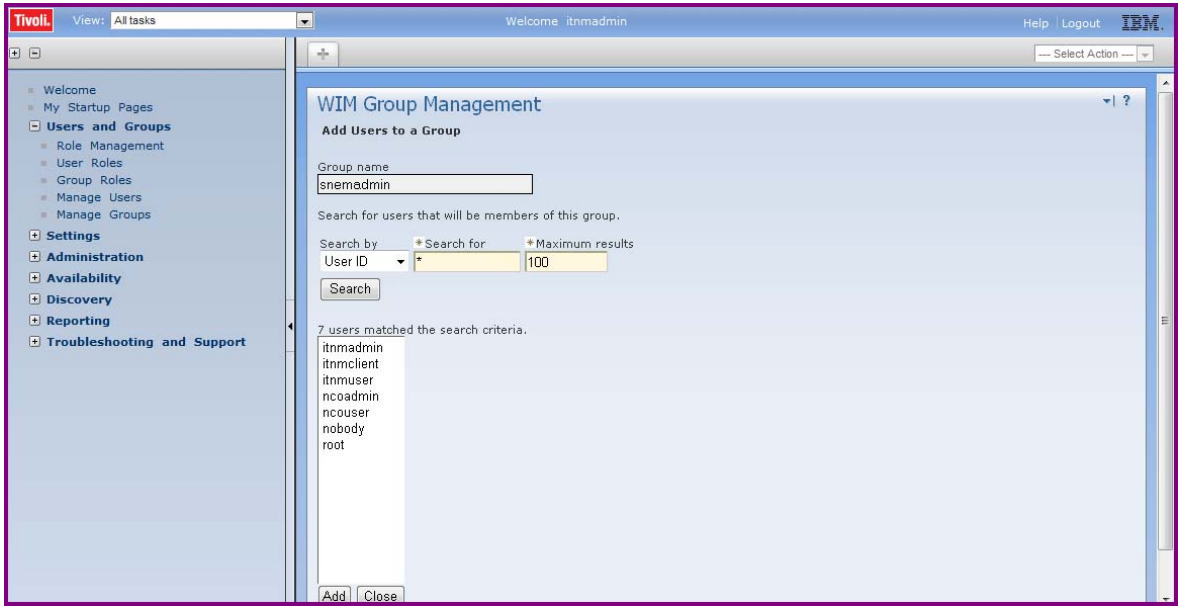
8 Select the Members tab to add users.



9 Click **Add Users...** to open the Add Users to a Group dialog.



10 Click **Search** to list all of the configured users.



To list only those users matching the search pattern, type the user name in the *** Search for** field and click **Search**.

11 Select the user you want to add to the Switch Center User Group and click **Add**.

12 Repeat steps 7-11 to add other users to other Switch Center User Groups.

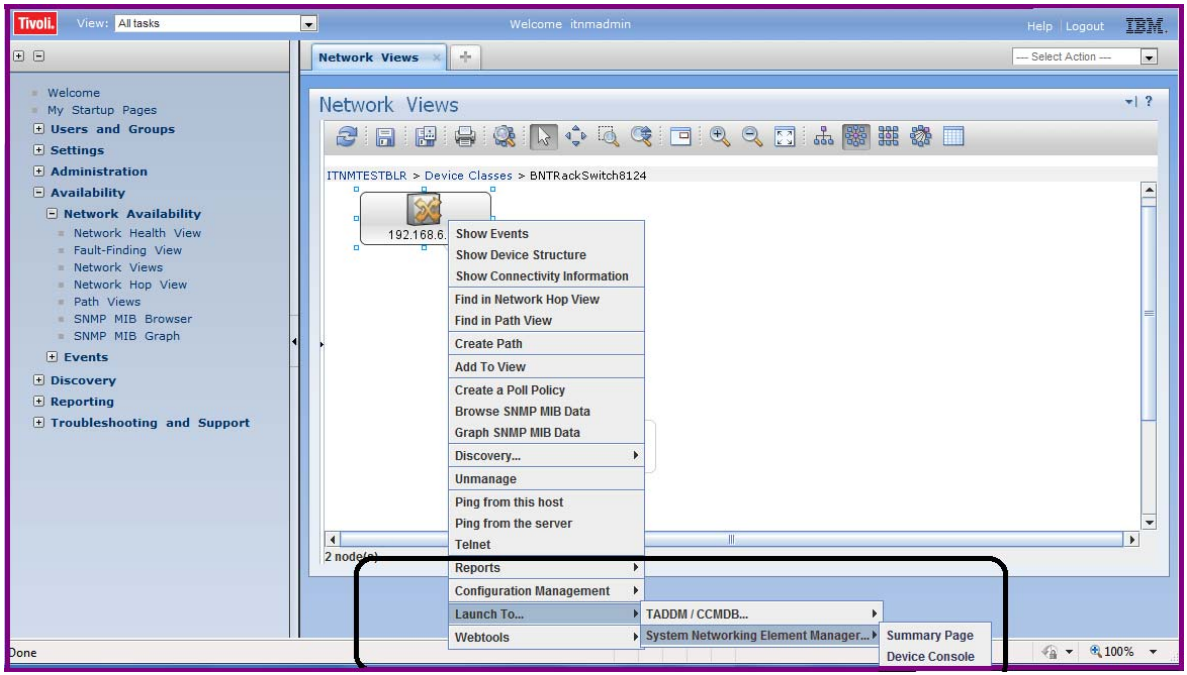
Note: You can add multiple Switch Center User Groups for a user. However, Switch Center selects the highest User Group privilege while launching the screens (for example, if a user is assigned with snscadmin and snscoper Groups, then Switch Center picks `snscadmin`, the highest privileged User Group, for operations.

Step 5: Edit IBM Tivoli Network Manager tools and menu configuration files

The following steps describe the configuration changes required for creating the following Switch Center launch menus (see Figure 102).

1. To launch Switch Center's Device Console > Monitor > Summary > Health Status page:
   Right-click an IBM BLADE switch icon, and choose menu **Launch To… > Switch Center… > Switch Center > Device Console**.
2. To launch Switch Center's Summary page (Main page):
   Right-click an IBM BLADE switch icon, and choose menu **Launch To… > Switch Center… > Switch Center > Summary Page**.

Figure 102 TIP GUI showing Switch Center launch menus



Step 5.1: IBM Tivoli Network Manager – TNM Properties

Edit Tivoli Network Manager's `tnm.properties` file to add Switch Center host information.

1. Login to Tivoli Network Manager system as an Administrator or root.
2. Open `$ITNMHOME/profiles/TIPProfile/etc/tnm/tnm.properties`.

   On Linux system, the path is as follows:
   `/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/tnm.properties`
3. Add the following two properties:
   `tnm.snsc.serverName=`*<Host Name/IP address of SNSC System>*
   `tnm.snsc.serverPort=`*<HTTPs port on which SNSC is listening>*

For example, if Switch Center is running on 192.168.1.1 on HTTPs port 40443, then the following lines should be added in the `tnm.properties` file:

```
tnm.snsc.serverName=192.168.1.1
tnm.snsc.serverPort=40443
```

Step 5.2: IBM Tivoli Network Manager – Create Switch Center Launch-In-Context Tools Files

1 Create Device Specific Switch Center Launch Tools File.

Note: In this example menu, the rules are configured to launch Switch Center's **Device Console > Monitor > Health Status** tab.

Create the tools file, for example `ncp_snsc_device.xml`, under the following directory: `$ITNMHOME/profiles/TIPProfile/etc/tnm/tools`

On Linux system, the path is as follows:

`/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/tools/ncp_snsc_device.xml`

2 Add the following details and save the contents of the file:

```
<ncp_tool id="ncp_snsc_device" label="Device Console" type="url">
<url value="https://{%prop:tnm.snsc.serverName}:{%prop:tnm.snsc.serverPort}/snsc/jsp/Launch.jsp"
      target="_blank" method="GET">
<parameter name="ipaddress" valueType="ncim" table="chassis" column="accessIPAddress"
      runOnMainNode="true"/>
<parameter name="sysname" valueType="ncim" table="chassis" column="sysName"
      runOnMainNode="true"/>
<parameter name="pageid" valueType="text" text="mon_sum_hs"/>
</url>
<context>
<attribute id="sysName" valueType="ncim" table="chassis" column="accessIPAddress">
<notequals value=""/>
</attribute>
</context>
</ncp_tool>
```

Refer to "Appendix A: Externally Launching IBM Switch Center" on page 811 for details about `ipaddress`, `sysname` and `pageid` parameters.

Create Switch Center Summary Page (Main Page) Launch Tools File

1 Create the tools file, for example `ncp_snsc_main.xml`, under the following directory: `$ITNMHOME/profiles/TIPProfile/etc/tnm/tools`

On Linux system, the path is as follows:

`/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/tools/ncp_snsc_main.xml`

2 Add the following details and save the contents of the file:

```
<ncp_tool id="ncp_snsc_main" label="Summary Page" type="url">
<url value="https://{%prop:tnm.snsc.serverName}:{%prop:tnm.snsc.serverPort}/snsc/jsp/
Launch.jsp"
target="_blank" method="GET" omitDefaultParameters="true">
</url>
</ncp_tool>
```

Step 5.3: IBM Tivoli Network Manager – Create Switch Center Launch-In-Context Menu File

Create SNSC specific LIC Menu files by providing references to Switch Center Launch Tools File created in "Step 5.2: IBM Tivoli Network Manager – Create Switch Center Launch-In-Context Tools Files" on page 833.

1 Create the menu file, for example `ncp_snsc_lic.xml`, under the following directoryu: `$ITNMHOME/profiles/TIPProfile/etc/tnm/menus`

On Linux system, the path is:

`/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/menus/ncp_snsc_lic.xml`

2 Add the following details and save the contents of the file:

```
<ncp_menu id="ncp_snsc_lic" label="SNSC...">
<definition>
<tool id="ncp_snsc_device"/>
<tool id="ncp_snsc_main"/>
</definition>
</ncp_menu>
```

Step 5.4: IBM Tivoli Network Manager – Update Global Launch-In-Context Menu File

Edit Tivoli Network Manager's Global Launch-In-Context file (`ncp_wt_lic.xml`) to add the Switch Center launch-in-context menu created in "Step 5.3: IBM Tivoli Network Manager – Create Switch Center Launch-In-Context Menu File" on page 834:

1 Open `$ITNMHOME/profiles/TIPProfile/etc/tnm/menus/ncp_wt_lic.xml`

On Linux system, the path is:

`/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/menus/ncp_wt_lic.xml`

2 Add the following line inside the <definition> tag:

```
<menu id="ncp_snsc_lic"/>
```

After adding the above line, the contents of the file should look somewhat similar to the below listing:

```
<ncp_menu id="ncp_wt_lic" label="Launch To...">
<context>
<attribute id="licURL" valueType="launchInContext">
<exists/>
</attribute>
</context>
<definition>
<menu id="ncp_wt_lic_sdnc"/>
<menu id="ncp_wt_lic_taddm"/>
<menu id="ncp_wt_lic_tpc"/>
<menu id="ncp_snsc_lic"/>
</definition>
</ncp_menu>
```

Step 6: Re-login to IBM Tivoli Network Manager TIP GUI

Tivoli Network Manager TIP takes couple of minutes to load the newly created Switch Center Launch-In-Context menus.

1 [Optional] If you are logged in to TIP GUI, logout.

2 Wait approximately two minutes.

3 Login to Tivoli Network Manager TIP GUI as a Tivoli Network Manager user belonging to an Switch Center User Group (see “Step 4: Create Switch Center User Groups in IBM Tivoli Network Manager” on page 827).

4 Click **Availability > Network Availability > Network Views** to open the network view showing the discovered IBM BLADE Switch (see “Requirements” on page 821).

5 Right-click the discovered IBM BLADE Switch and select one of the following:

- **Launch To.. > Switch Center… > Switch Center** to launch the Device Console’s Monitor > Summary > Health Status page.
- **Launch To..> Switch Center… > Switch Center Summary Page** to launch Switch Center Summary page (Main page).

Appendix C: Integrating Switch Center with IBM Systems Director

Switch Center (SNSC) can be integrated with IBM Systems Director 6.3 and above so that Switch Center can be launched from IBM Systems Director GUI. Switch Center supports Launch-In-Context (LIC) and Single Sign-On (SSO) based launch from IBM Systems Director. This section describes various steps involved in configuring IBM Systems Director required for integrating Switch Center.

Note: Before you start working on different steps, make sure to discover the host, where Switch Center is installed, in IBM Systems Director.

Step 1: Create External App Launch Template File

The template file provides the information necessary to register an external application. A template file defines one or more external launch points for a single external application. The template file is written using JavaScript Object Notation (JSON) format.

Note:Though the template file lets you to define one or more external launch points, but it is preferable to define only one launch point per template file since IBM Systems Director uses `applicationID` and `browserWindowID` for identifying the browser window in which the application is launched. So if you define multiple launch points in a single template file, the newly launched external application replaces the previously launched external application contents in the window.

The following sample template file defines the rules for launching Switch Center's **Device Console > Monitor > Summary > Health Status**, **Summary Page** and **Virtualization Tools > VSI DB Console** pages:

1. Login as an Administrator (in case of Windows) or as root (in case of Linux/AIX) to the system where IBM Systems Director is installed.
2. Create the following template file in any directory. For example, you can create a file named `snsc.json`

```
{
    "version": "6.2.0.0",
    "type": "URI",
    "applicationID": "IBMSNSC",
    "browserWindowID": "SNSC001",
    "resolveURI": false,
    "uriBase": "https://<IBM System_Networking_Element_Manager Server
Address>:40443/snsc/jsp",
    "binding": {
        "objectType" : "Switch"
    },
    "security": {
        "ssoEnabled" : true,
        "ssoType"    : "UserCredential",
        "authRegType": "LocalOS",
        "credPassing": "POST_ENCODED_TEXT",
        "userNameKey": "login-user-name",
        "passwordKey": "login-password"
    },
    "launchpoints" : [
    {
        "launchPointID" : "SNSC01",
        "displayName": [
            { "lang": "default", "text": "IBM SNSC Device Console" }
        ],
        "description": [
            { "lang": "default", "text": "IBM SNSC Device Console launch po
int" }
        ],
        "uriExtension": "/Launch.jsp",
         "uriParameters": {
              "encoding": "base64",
              "pageid": "mon_sum_hs",
              "ipaddress": "{Switch.DeviceName}"
         }
    },
    {
        "launchPointID" : "SNSC02",
        "displayName": [
            { "lang": "default", "text": "IBM SNSC Summary" }
        ],
```

```
        "description": [
            { "lang": "default", "text": "IBM SNSC Summary launch point" }
        ],
        "uriExtension": "/Launch.jsp",
         "uriParameters": {
              "encoding": "base64",
         }
    },
    {
        "launchPointID" : "SNSC03",
        "displayName": [
            { "lang": "default", "text": "IBM SNSC VSI Manager" }
        ],
        "description": [
            { "lang": "default", "text": "IBM SNSC VSI Manager launch point
" }
        ],
        "uriExtension": "/Launch.jsp",
         "uriParameters": {
              "encoding": "base64",
              "pageid": "vsi_manager"
         }
    },
  ],
}
```

Table 378 Template File field descriptions

Field	Type	Required	Description
`version`	String	Yes	Value representing the version of the template schema used to define the launch points. This value coincides with the version of the SDK where the template schema is defined.
`type`	String	Yes	Value representing the type of launch points defined. Valid values are: URI

`applicationID`	String	Optional	Application identifier for the grouping of launch points defined in the template file. This unique value is used as a reference for IBM® Systems Director when performing internal operations. The applicationID/launchPointID combination must be unique among all registered launch points. Specifying this value is optional; if it is not specified, a unique applicationID will be generated dynamically. If a specified applicationID already exists, registration will fail and an error will be returned. **Note**: Application ID string cannot contain a blank (white) space character.
`browserWindowID`	String	Optional	An ID to associate the browser window to use for the launch point. Launch points with the same browserWindowID will be launched into the same browser window. If this value is not defined, it will be automatically generated such that all launch points for given application will share the same browser window. In addition, if resolveURI is true, then unless specified, all launch points for a given targeted managed resource will share the same browser window.
`resolveURI`	Boolean	Optional	Indicates if the launch point URI value should be resolved before launching. Resolving the URI involves replacing the variable {hostname} with the targeted resource hostname value. This value can only be true if the launch point URI has the variable {hostname} included in it, and the launch point has binding information specified (making it targeted). If this value is false, the launch point URI is launched as is.
`uriBase`	String	Yes	The base URL to the external Web-based application associated with this launch point. This value cannot include the "?" character. This value can have the following special substring included as part of its value: {hostname}. If the {hostname} substring is included, the launch point must be targeted (by specifying a binding). The uriBase value will be concatenated with the uriExtension to form the final URI value. NOTE: This value is overridden if a fully qualified uriExtension value is defined for a launch point. See uriExtension information for more details. **Note**: If security is enabled, the endpoint represented by the hostname included in the uriBase value must be discovered and managed by IBM Systems Director.
`binding`	Object	Yes	Launch points defined in template can be associated with resources in IBM® Systems Director environment using binding criteria.

objectType	String	Yes, if binding is present	Part of the binding specification, this value identifies the objectType value within IBM Systems Director this launch point is bound to. Example: OperatingSystem. This value must be a valid ObjectType as defined by the IBM Systems Director Data Model. By specifying this value, the launch point(s) associated with this objectType binding become targeted. The binding specification can be specified at the application level (in effect for ALL launch points defined) or at the individual launch point level. If this binding value is specified at the launch point level, it overrides the value defined at the application level.
security	Object	Yes	Defines the security credentials for the application launch.
ssoEnabled	Boolean	Yes, if SSO is enabled	Indicates whether SSO is enabled for all launch points.
ssoType	String	Yes	The SSO credential type. Valid values are: UserCredential
authRegType	String	Optional	The type of authentication registry to use for authentication. Valid values are as follows: • LocalOS - Local OperatingSystem registry • LDAP - Lightweight Directory Access Protocol registry • DOMAIN - Windows Active Directory (DOMAIN) registry
credPassing	String	Optional	The technique used to pass credentials (username and password). The username is always passed URLencoded using UTF-8 encoding. The password is encoded using base64 encoding whenever POST_ENCODED_TEXT is specified. The password is sent URLencoded using UTF-8 encoding whenever POST_PLAIN_TEXT is specified. Allowed values are as follows: • POST_PLAIN_TEXT - Indicates username and password be sent as part of the HTTP request header when launching the external application. • POST_ENCODED_TEXT - Indicates username and password (base64 encoded) be sent as part of the HTTP request header when launching the external application.
userNameKey	String	Optional	The key to associate with the username value when passing information to the launch point application. The username key and value are passed either as part of the query string or as a variable in the HTTP POST message.
passwordKey	String	Optional	The key to associate with the password value when passing information to the launch point application. The password key and value are passed either as part of the query string or as a variable in the HTTP POST message.
launchpoints	Object	Yes	An array of launch points to the application.

`launchPointID`	String	Yes	Unique name/ID for a specific launch point entry. This value is used as a reference for IBM Systems Director when performing internal operations. The applicationID/ launchPointID combination must be unique among all registered launch points. If a specified launchpointID already exists under a given applicationID, registration will fail and an error will be returned.
`displayName`	String	Yes	An array of localized text representing the display name for the launch point. The default text value must be specified; all other supported languages are optional.
`description`	String	Optional	An array of localized text representing the description for the launch point. The primary intent of this field is to enable an administrator to understand the purpose of the launch point, as the display name may not fully describe the intent of the entry. The default text value must be specified; all other supported languages are optional.
`uriExtension`	String	Optional	The string to concatenate to the base URL defined by uriBase to form the fully qualified URI value. This value cannot include the ? (question mark) character. If the value is a fully qualified URL (example: `http://`<*address*>), then the uriBase value is disregarded and the uriExtension becomes the fully qualified URI for the launch point.
`uriParameters`	String	Optional	A list of parameters values to be passed to the launch point application. The parameters themselves are specified in the format `"key":"value"`, where `key` is the parameter name and `value` is the parameter value. Parameter values are passed URLEncoded using UTF-8. Options for the parameter value are as follows: • **Static**: A static parameter value is passed as-is to the launch point application. This parameter has the same value regardless of targeted resource. • **Dynamic**: A dynamic parameter value is resolved at runtime using data from IBM Systems Director. The parameter value is based on the context of the targeted resource.

`encoding`	String	Yes	Determines whether the credentials are encoded or not. Possible values are as follows: • **plain**: If 'credPassing' in security object is defined as POST_PLAIN_TEXT • **base64**: If 'credPassing' in security object is defined as POST_ENCODED_TEXT **Note**: The encoding field should be set by the user, depending on the type of credPassing setting. Make sure you assign the correct value. For example, if credPassing is set to POST_PLAIN_TEXT, but encoding is set to base64, the authentication will fail.
`pageid`	String	Yes	Indicates the page/tab in SNSC's UI to be launched. For various `pageid` mappings, refer to "Appendix A: Externally Launching IBM Switch Center" on page 811.
`ipaddress`	String	Yes, if device-specific page is the launch point	If the external application launch should be associated with the IP address/device address, this field should be set to {Switch.DeviceName}, which enables IBM Systems Director to pass either the IP address or the sysName assigned to the selected device.

Step 2: Register External App Launch Template File

The template file created in "Step 1: Create External App Launch Template File" on page 837 should be registered with IBM Systems Director. You can register the template file using IBM Systems Director's `smcli` command utility.

To register the template file:

1. Login as an Administrator (in case of Windows) or as root (in case of Linux/AIX) to the system where IBM Systems Director is installed and the template file was created.
2. Register the template file:

   ```
   smcli importextlps -f <template file path>
   ```

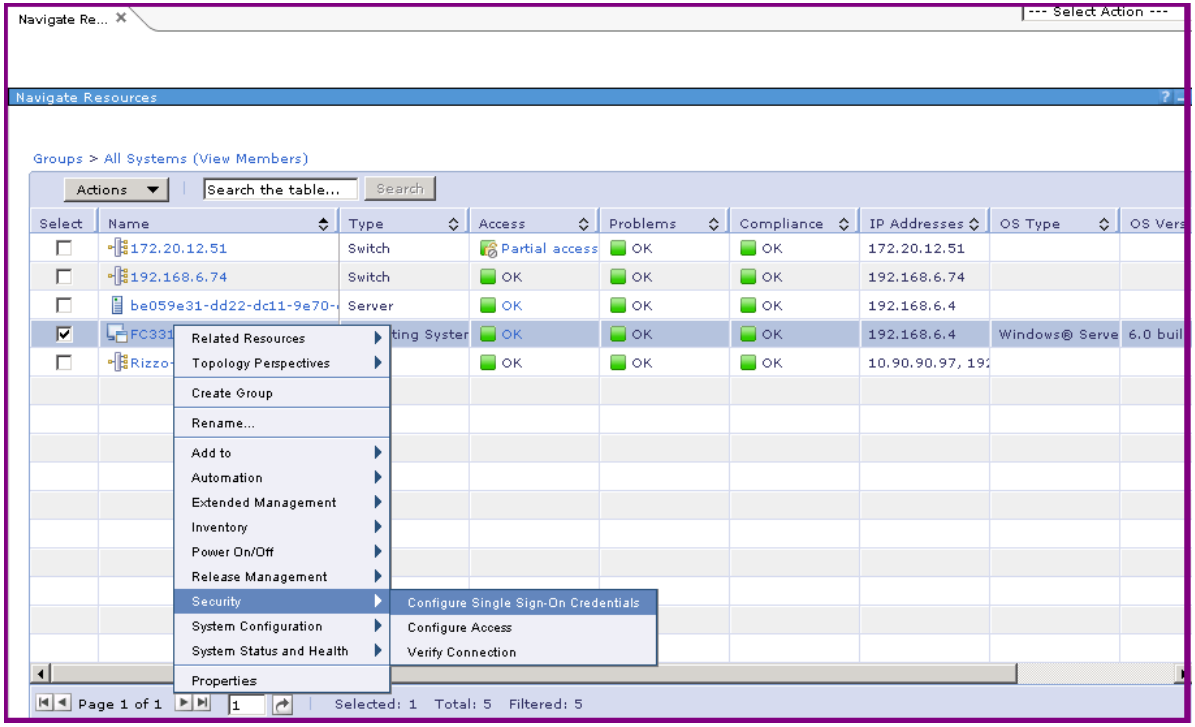
   Note:You can view the registered launch points by executing the following command: `smcli listextlps`

   Note:You can remove (unregister) an external launch point by executing the following command: `smcli removeextlps –A` <*applicationID*>

   Where <*applicationID*> is the ID used in the template JSON file.

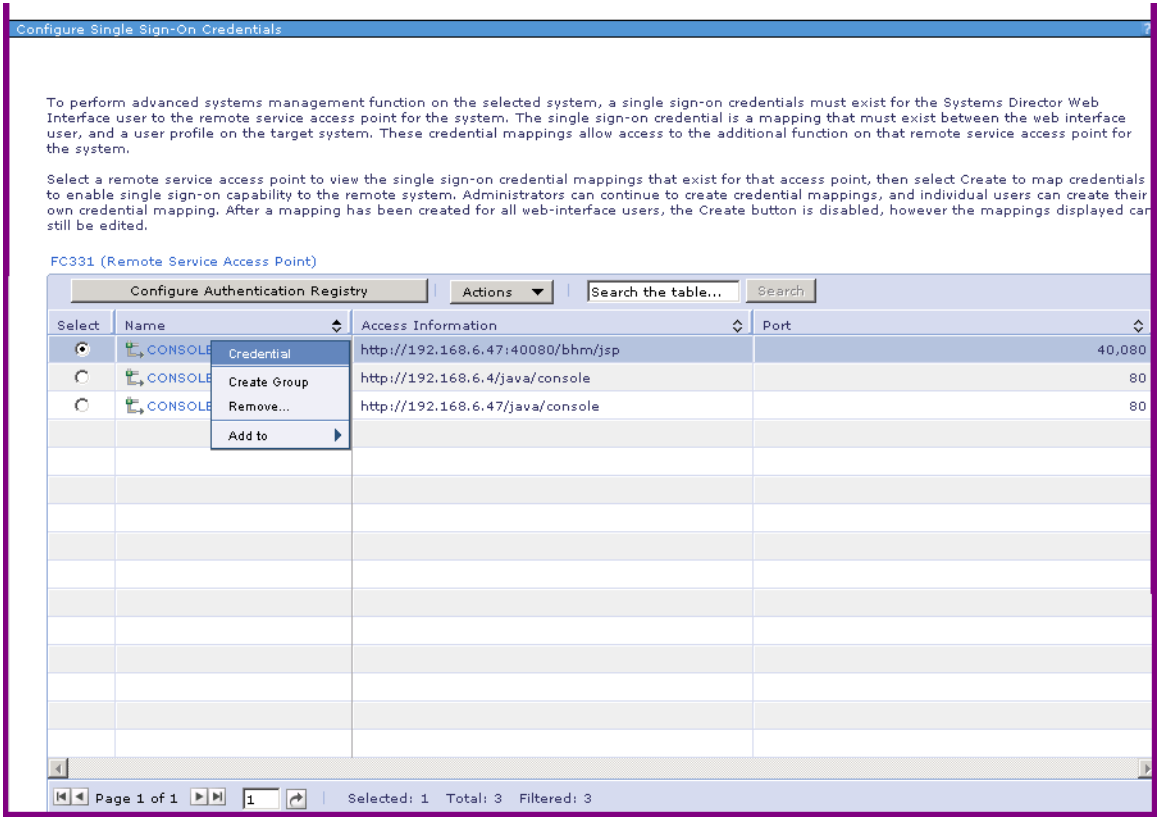
Step 3: Configure Single Sign-On Credentials

1. Login to IBM Systems Director.
2. From the task list in the left pane, select **Navigate Resources**.
3. From the Groups table on the Navigate Resources tab, select **All Systems**.
4. In the **Group > All Systems** table, right-click the IBM Switch Center server entry.
5. Choose menu **Security > Configure Single Sign-On Credentials**.

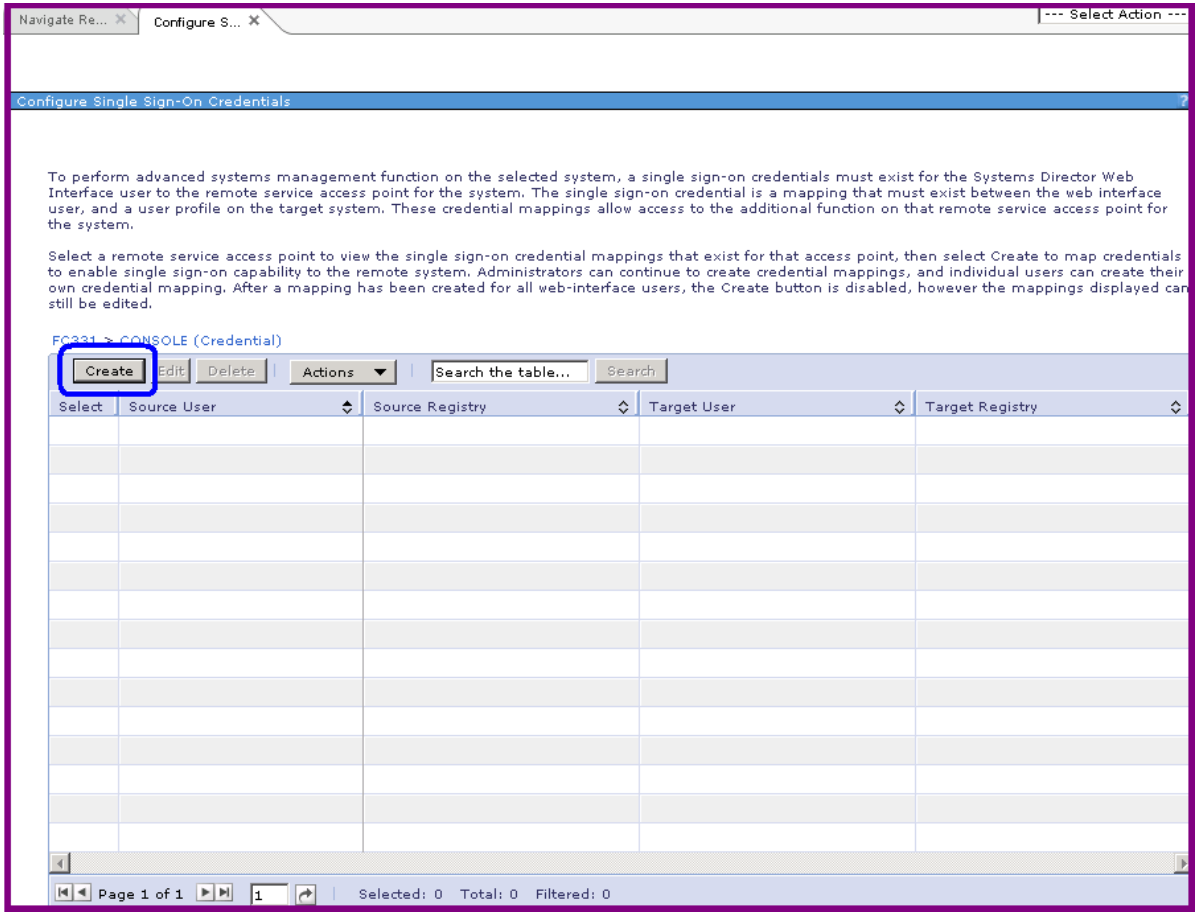


6. Right-click the entry that contains the Access Information:
   `http://`*<IBM Switch Center IP>*`:`*<Port>*`/snsc/jsp`

7 Choose menu **Credential**.



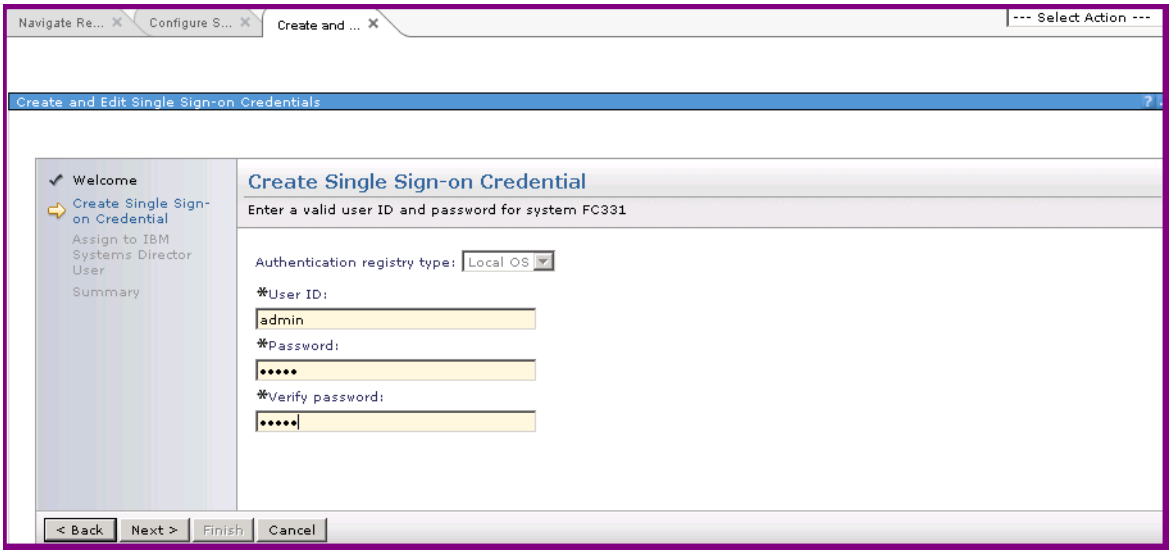
8 Click **Create**.



9 Click **Next**.

10 Type the user ID and password with the values of the Login ID and Password fields of the user account configured in Switch Center.

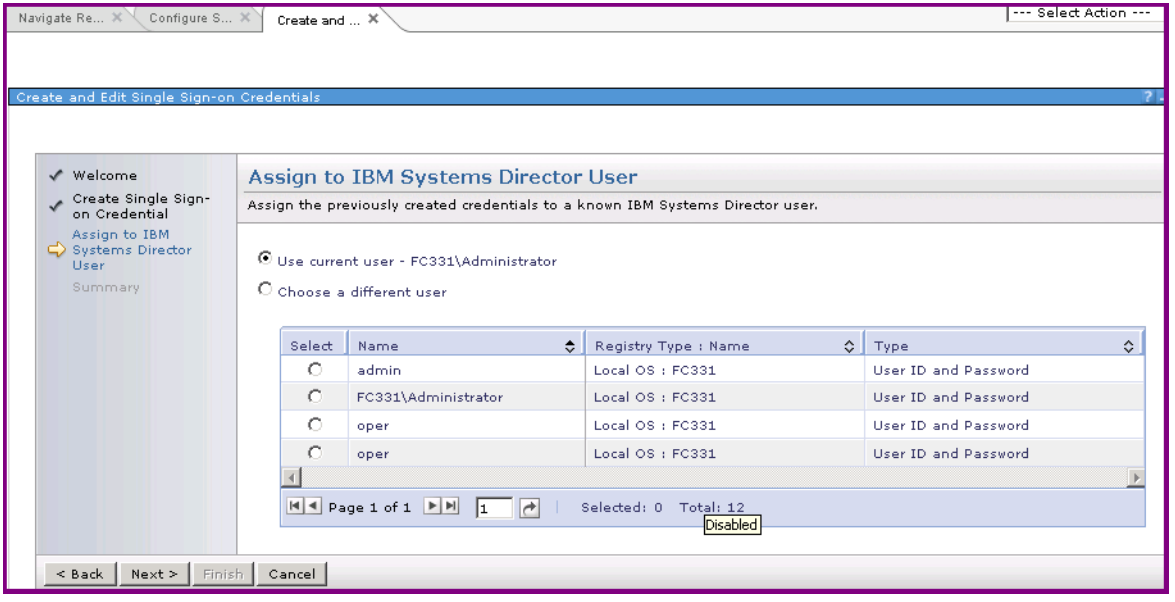
11 Click **Next**.



12 Do not modify the default Use current user option.

13 Click **Next**.

14 On the Summary page, click **Finish**.



Appendix D: Using Third-Party JDBC/ ODBC Tools for Querying SNSC Database

Switch Center component uses IBM Derby database for data storage and IBM Derby is configured to run in Network Server mode, which enables accessing SNSC DB through multiple connections. This section describes the steps that can be used for retrieving the data from SNSC Database using third-party JDBC/ODBC tool such as EasySoft ODBC-JDBC Gateway.

Note: The steps given in this section pertains to 3rd party tools installed on Microsoft Windows XP/7 OS.

Requirements

- Java Runtime Environment (JRE) 1.5 or above installed.
- EasySoft ODBC-JDBC Gateway v 2.3 for Microsoft Windows platform (http://www.easysoft.com/products/data_access/odbc_jdbc_gateway/index.html) installed.
- ODBC Test Utility (http://media.datadirect.com/download/files/Tools/odbctest.zip) is installed. Note that ODBC Test Utility is packaged as a Windows Zip file. Extract the contents of the zip file to install ODBC Test Utility.
- IBM Derby client JAR file copied to a directory on the system where you have installed EasySoft ODBC-JDBC Gateway. You can find IBM Derby client (`derbyclient.jar`) under the folowing directory:
  `<SNSC Installation Directory>/derby/lib/`

Task 1: EasySoft ODBC-JDBC Gateway – Configuring JVM

1. Click **Start > Programs > EasySoft > ODBC-JDBC Gateway > Configure Java Interface** to open the Setup Java Interface window.
2. Set the JVM Library path.

a Click the elipsis button (**...**) next to JVM Library path text field to open the Select JVM window.

b By default, Select JVM window lists the known JVM libs (`<Java Install Path>\bin\client\jvm.dll`). You can also click the **Browse** or **Search** buttons to find other JVM library paths.

c Select the appropriate JVM library by double-clicking the listed library path.

d (Optional) Click **Test** and **Save if OK** button to test the selected JVM library and save only if the test was successful.

e Click **OK** to save the changes.

Task 2: EasySoft ODBC-JDBC Gateway – Configuring Data Source (DSN)

1. Select **Start > Control Panel > Administrative Tools** and click **Data Source (ODBC)** to open the ODBC Data Source Administrator window.
2. Select System DSN tab and click **Add…** to open the Create New Data Source window.
3. Select **EasySoft ODBC-JDBC Gateway** option and click **Finish** to open the EasySoft ODBC-JDBC Gateway DSN Setup window.
4. In EasySoft ODBC-JDBC Gateway DSN Setup window, complete the fields as follows and then click **OK**.

   a DSN
   Enter the DSN name for this entry. For example, SNSC DB.

   b Description
   (Optional) Enter any descriptive text.

   c Driver Class
   Specify the IBM Derby network driver class (`org.apache.derby.jdbc.ClientDriver`)

   d Class Path
   Specify the patch where you have copied IBM Derby client JAR file (see “Requirements” on page 849).

   For example, if IBM Derby client JAR (`derbyclient.jar`) is located under `c:\tools\derby\ directory`,
   then type `c:\tools\derby\derbyclient.jar`

   e URL
   Specify the SNSC DB URL as follows:

```
jdbc:derby://<SNSC Host IP Address>:41527/<SNSC Install
Path>/database/snsc;create=false
```

For example, if SNSC is installed on RHEL 5.0 system 192.168.1.1, enter:

```
jdbc:derby://192.168.1.1:41527//opt/ibm/snsc/database/
snsc;create=false
```

5 Once the Data Source is created and listed, click **OK** to complete.

Task 3: ODBC Test Utility – Connecting to Data Source

1 Navigate to the directory in which you have extracted ODBC Test Utility contents.

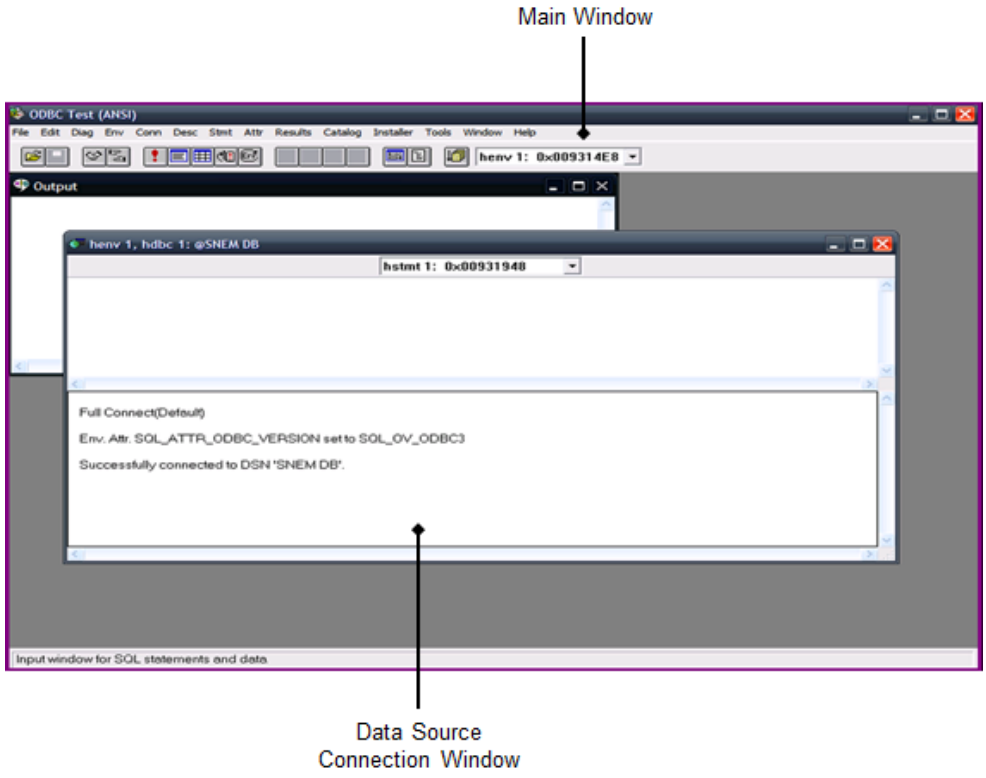
2 Double-click `OdbcTE32.exe` to bring ODBC Test Utility window.

3 Select **Conn > Full Connect…** to bring up Full Connect window.

4 In Full Connect window, select the ODBC datasource (for example, SNSC DB) that you created (see “Task 2: EasySoft ODBC-JDBC Gateway – Configuring Data Source (DSN)” on page 850).

5 Click **OK** to establish the connection with the database. A successful connection to Data Source brings up another window (see Figure 103) enabling you to execute database queries.

Figure 103 ODBC Test Utility window



Task 4: ODBC Test Utility – Retrieving the Data from the Database and Viewing

After successfully establishing the connection with the Data Source, you can retrieve and view the data using the following steps:

1 In Data Source Connection Window's upper panel (see Figure 103), enter the SQL query associated with the DB table you want to query.

For example, to retrieve and view all the data from the Device table, type select * from Device.

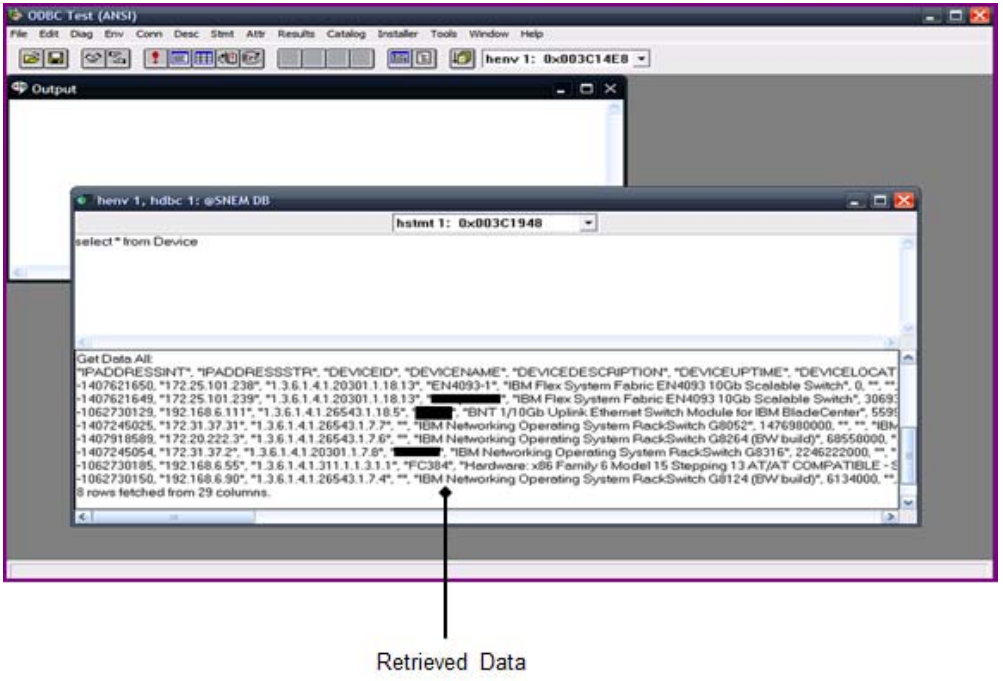
Note: Refer to the following file for complete list of database tables used by SNSC for storing the data: `<SNSC Install Path>/database/snscdb.sql`

2 In the Main Window (see Figure 103), select **Stmt>SQLExecDirect…** to execute the SQL statement.

3 In the Main Window, choose menu **Results > Get Data All** for listing the retrieved data (see Figure 104).

Note: You can also view the data in tabular format. For details, you can refer ODBC Test Utility documents.

Figure 104 ODBC Test Utility window with retrieved data



Index

D

E

F

G

H

I

T

U

V

W