

# Configuring the Switch

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This chapter describes how to perform these configuration tasks:

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For detailed descriptions and configuration instructions, refer to the *Software Configuration Guide* for your switch.

# Default Global System Configuration

The default supervisor engine configuration is as follows:

| Feature                               | Default Setting   |
|---------------------------------------|---|
| Console port                          | The console port is configured as follows:<br>9600 baud, 8 data bits, no parity, 1 stop bit.                    |
| Passwords                             | There is no default password for normal and privileged modes. Press <b>Return</b> at the Enter Password prompt. |
| System prompt                         | Console>  |
| In-band (sc0) interface configuration | The in-band interface is in VLAN 1; the IP address, subnet mask, and broadcast address are set to 0.0.0.0.      |
| Default gateway                       | Default gateway address is 0.0.0.0 with a metric of 0.  |

# Default Ethernet, Fast Ethernet, and Gigabit Ethernet Configuration

The default Ethernet, Fast Ethernet, and Gigabit Ethernet port configuration is as follows:

| Feature                           | Default Setting  |
|-----------------------------------|--|
| Port enable state                 | All ports are enabled.   |
| Port name                         | None.  |
| Port priority level               | Normal.  |
| Port duplex setting               | Auto (to autonegotiate duplex mode) on Ethernet and Fast Ethernet; full-duplex on Gigabit Ethernet (half-duplex is not allowed). |
| Port speed (on 10/100-Mbps ports) | Auto (to autonegotiate both speed and duplex).   |
| Spanning-Tree Protocol            | Enabled for VLAN 1.  |
| Spanning-tree port-VLAN cost      | 19 for Ethernet and Fast Ethernet ports, 4 for Gigabit Ethernet ports.   |

| Feature   | Default Setting  |
|---|--|
| Spanning-tree port-VLAN priority  | 32.  |
| VLAN  | All ports are on VLAN 1.   |
| Fast EtherChannel (available only on certain supervisor engine and Fast Ethernet ports) | Disabled.  |
| Flow control (on Gigabit Ethernet ports)  | Flow control send is set to desired; flow control receive is set to off. |

## Setting the Switch IP Address

Before you can Telnet to your Catalyst 2926 and Catalyst 2926G series switches, you need to assign an IP address, a subnet mask, and a default gateway. This information allows the switch to communicate using the IP protocol.

When configuring the switch for the first time, assign the in-band (sc0) interface to the default VLAN, VLAN 1. After you have configured additional VLANs, you can assign the interface to any VLAN. Make sure the IP address you specify belongs to the subnet associated with that VLAN.

To assign an IP address, subnet mask, and default gateway to your switch, perform these steps in privileged mode:

| Task  | Command   |
|---|---|
| <b>Step 1</b> Assign an IP address and subnet mask to the switch.   | <b>set interface sc0</b> <i>ip_addr netmask</i> |
| <b>Step 2</b> (Optional) Assign the switch interface to a VLAN. (If you do not specify a VLAN, VLAN 1 is used.) | <b>set interface sc0</b> <i>vlan_num</i>        |
| <b>Step 3</b> Assign a default gateway to the switch.   | <b>set ip route default</b> <i>gateway</i>      |
| <b>Step 4</b> Verify the in-band interface configuration.   | <b>show interface</b>                           |
| <b>Step 5</b> Verify the default gateway assignment.  | <b>show ip route</b>                            |

| Task   | Command   |
|--|---|
| <b>Step 6</b> Test connectivity to a remote host on the network. | <b>ping</b> [-s] <i>host</i> [ <i>packet_size</i> ] [ <i>packet_count</i> ] |

## Configuring Ethernet, Fast Ethernet, and Gigabit Ethernet Ports

Ethernet, Fast Ethernet, and Gigabit Ethernet ports on both ends of a link must use the same port speed and duplex in order to communicate. The ports are configured as follows:

- Ethernet and Fast Ethernet ports autonegotiate duplex mode.
- 10/100-Mbps Fast Ethernet ports autonegotiate port speed.
- Gigabit Ethernet ports are set to full-duplex (half-duplex is not allowed on Gigabit Ethernet).

To set the port configuration on Ethernet or Fast Ethernet ports, perform these steps in privileged mode:

| Task  | Command  |
|---|--|
| <b>Step 1</b> On 10/100-Mbps Fast Ethernet ports, set the port speed. Use the <b>auto</b> keyword to configure the port to autonegotiate both port speed and duplex mode with the connected port. | <b>set port speed</b> <i>mod_num/port_num</i> { <b>10</b>   <b>100</b>   <b>auto</b> }     |
| <b>Step 2</b> On Ethernet or Fast Ethernet ports, set the port duplex mode. Use the <b>auto</b> keyword to configure the port to autonegotiate duplex mode <sup>1</sup> .                         | <b>set port duplex</b> <i>mod_num/port_num</i> { <b>full</b>   <b>half</b>   <b>auto</b> } |
| <b>Step 3</b> Enable the port, if necessary.  | <b>set port enable</b> <i>mod_num/port_num</i>   |
| <b>Step 4</b> Set the port name, if desired.  | <b>set port name</b> <i>mod_num/port_num</i> <i>name_string</i>                            |
| <b>Step 5</b> Verify the port configuration.  | <b>show port</b> <i>mod_num/port_num</i>   |

<sup>1</sup> On 10/100-Mbps Fast Ethernet ports, you cannot change the duplex mode manually if the port speed is set to **auto**.

## Configuring the Global System Settings

You can specify a variety of useful global system settings for your switch, such as system name, current date and time, system prompt, and passwords.

To configure the global system settings, perform these steps in privileged mode:

| Task   | Command                                   |
|--|---|
| <b>Step 1</b> Set the system name.   | <b>set system name</b> <i>name_string</i> |
| <b>Step 2</b> Set the current date and time.   | <b>set time</b> <i>mm/dd/yy hh:mm:ss</i>  |
| <b>Step 3</b> Set the system prompt. (By default, if the system name is set, it is used as the prompt. Use this command to override the default name.) | <b>set prompt</b> <i>prompt_string</i>    |
| <b>Step 4</b> Set the console password (used to access the switch CLI).  | <b>set password</b>                       |
| <b>Step 5</b> Set the enable password (used to access privileged configuration mode).  | <b>set enablepass</b>                     |

## Checking Network Connectivity

After the switch is assigned an IP address and a default gateway, and at least one switch port is connected to the network and properly configured, you should be able to communicate with other nodes on the network.

To check whether the switch is properly connected and configured, perform these tasks in privileged mode:

| Task  | Command   |
|---|---|
| <b>Step 1</b> Ping another node on the network.   | <b>ping</b> [-s] <i>host</i> [ <i>packet_size</i> ] [ <i>packet_count</i> ] |
| <b>Step 2</b> (Optional) Trace the route of packets through the network to another node (only Layer 3 devices, such as routers, will appear in the path). | <b>traceroute</b> [-q <i>nqueries</i> ] <i>host</i> [ <i>data_size</i> ]    |

## Configuring Flow Control (Catalyst 2926G Series Switch Only)

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| Task  | Command               |
|---|-----------------------|
| <b>Step 3</b> If the host is unresponsive, check the IP address, subnet mask, broadcast address, and VLAN assignment of the in-band (sc0) switch interface. | <b>show interface</b> |
| <b>Step 4</b> If the interface is properly configured, check the default gateway assignment.  | <b>show ip route</b>  |

## Configuring Flow Control (Catalyst 2926G Series Switch Only)

The Catalyst 2926G series switch Gigabit Ethernet uplink ports and 10/100 Mbps autosensing Fast Ethernet switched ports use flow control, which inhibits packet transmission to the port for a period of time. If the port's receive buffer becomes full, the port transmits a "pause" packet that tells remote devices to delay sending more packets for a specified period of time. The port can also receive "pause" packets from other devices.

To configure flow control, enter the **set port flowcontrol {receive | send} mod\_num/port\_num {off | on | desired}** command. Table 5-1 lists the flow-control tasks and commands. By default, **send** is set to **desired** and **receive** is set to **off**.

**Table 5-1 Gigabit Ethernet set port flowcontrol Commands**

| Task   | Command   |
|--|---|
| • Tell a local port to send flow-control packets to a remote device.               | <b>set port flowcontrol send mod_num/port_num on</b>      |
| • Tell a local port to send flow-control packets if a remote device wants them.    | <b>set port flowcontrol send mod_num/port_num desired</b> |
| • Turn off a local port's ability to send flow-control packets to a remote device. | <b>set port flowcontrol send mod_num/port_num off</b>     |
| • Require a local port to be controlled by a remote device.                        | <b>set port flowcontrol receive mod_num/port_num on</b>   |

**Table 5-1 Gigabit Ethernet set port flowcontrol Commands**

| Task  | Command   |
|---|---|
| <ul style="list-style-type: none"> <li>Allow a local port to operate with an attached device that is required to send flow-control packets or with an attached device that is not required to but may send flow-control packets.</li> </ul> | <b>set port flowcontrol receive <i>mod_num/port_num</i> desired</b> |
| <ul style="list-style-type: none"> <li>Turn off an attached device's ability to send flow-control packets to a local port.</li> </ul>   | <b>set port flowcontrol receive <i>mod_num/port_num</i> off</b>     |

The following examples show the results of the **set port flowcontrol** commands:

```

Console> (enable) set port flowcontrol send 1/1 on
Port 1/1 will send flowcontrol to far end.
Console> (enable) set port flowcontrol send 1/1 desired
Port 1/1 will send flowcontrol to far end if far end supports it
Console> (enable) set port flowcontrol send 1/1 off
Port 1/1 will not send flowcontrol to far end
Console> (enable) set port flowcontrol receive 1/1 on
Port 1/1 will require far end to send flowcontrol
Console> (enable) set port flowcontrol receive 1/1 desired
Port 1/1 will allow far end to send flowcontrol
Console> (enable) set port flowcontrol receive 1/1 off
Port 1/1 will not allow far end to send flowcontrol
    
```

To display the current flow-control status and statistics, enter the **show port flowcontrol** command. The following example shows the results of the **show port flowcontrol** command:

```

Console> show port flowcontrol
Port  Send-Flowcontrol  Receive-Flowcntl  RxPause  TxPause
      Admin    Oper      Admin    Oper
-----
1/1   on      disagree on      disagree    0        0
1/2   off     off    off     off        0        0
    
```

## Configuring Link Negotiation (Catalyst 2926G Series Switch Only)



**Caution** Unlike autonegotiation with 10/100 Fast Ethernet, Gigabit Ethernet link negotiation does not involve negotiating port speed. You *cannot* disable link negotiation on Gigabit Ethernet ports using the **set port speed** command.

The Catalyst 2926G series switch Gigabit Ethernet uplink ports and 10/100 Mbps autosensing Fast Ethernet switched ports use link negotiation to exchange flow-control parameters, remote fault information, and duplex information (even though Cisco Gigabit Ethernet ports only support full-duplex mode). You configure link negotiation using the **set port negotiation** command. Port negotiation is enabled by default.

The ports on both ends of a link must have the same setting. The link will not come up if the ports at each end of the link are set inconsistently (link negotiation enabled on one port and disabled on the other). Refer to the *Software Configuration Guide* for your switch for more information.

To enable link negotiation on a port, perform this task in privileged mode:

| Task   | Command  |
|--|--|
| <b>Step 1</b> Enable link negotiation.                   | <b>set port negotiation</b> <i>mod_num/port_num</i><br><b>enable</b> |
| <b>Step 2</b> Verify the link negotiation configuration. | <b>show port negotiation</b> [ <i>mod_num/port_num</i> ]             |

This example shows how to enable port negotiation and verify the configuration:

```
Console> (enable) set port negotiation 2/1 enable
Port 2/1 negotiation enabled
Console> (enable) show port negotiation 2/1
Port   Link Negotiation
-----
2/1   enabled
Console> (enable)
```



To disable link negotiation on a port, perform this task in privileged mode:

| Task   | Command  |
|--|--|
| <b>Step 1</b> Disable Gigabit Ethernet link negotiation. | <b>set port negotiation</b> <i>mod_num/port_num</i> <b>disable</b> |
| <b>Step 2</b> Verify the link negotiation configuration. | <b>show port negotiation</b> [ <i>mod_num/port_num</i> ]           |

This example shows how to disable port negotiation and verify the configuration:

```
Console> (enable) set port negotiation 2/1 disable
Port 2/1 negotiation disabled
Console> (enable) show port negotiation 2/1
Port   Link Negotiation
-----
2/1   disabled
Console> (enable)
```

## Upgrading the Supervisor Engine Software

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**Note** To upgrade the supervisor engine software on the Catalyst 2926 and Catalyst 2926G series switch, see the section “Modifying the Startup Configuration” in the *Software Configuration Guide* for your switch.

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New software releases are released periodically to implement new features and enhancements and to provide maintenance for existing releases. You can use the following two methods to update the software on the switch:

- The fastest and easiest method is to initiate the network download to the switch using a Trivial File Transfer Protocol (TFTP) download server as described in the “Downloading a New System Image (Catalyst 2926 Series Switch)” section on page 5-10.

- The second method is to use Kermit (a file-transfer and terminal-emulation program) to download the software from a PC or workstation attached to the switch using the console port (Kermit is a public-domain UNIX program and is supplied on the software update disk). Refer to the *Software Configuration Guide* for your switch for a download procedure using Kermit.

Use the procedures in the following sections to verify your current software version and then, if necessary, download new software to the supervisor engine.

## Verifying the Software Version

When you start the switch, the system loads the system image from Flash memory. You can use the **show flash** or **show version** commands to display the current system image version.

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**Note** If necessary, you can reload the system image from Flash memory without restarting the system. Refer to the **reload** command description in the *Command Reference* for your switch for details.

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The **show version** and **show flash** commands show the current Flash code version on the first line of the supervisor engine display.

If the display shows that the system image loaded from Flash memory is not the correct version, enter the **download** command to load the new system image on the supervisor engine as described in the section “Downloading a New System Image (Catalyst 2926 Series Switch)” for a TFTP download procedure.

## Downloading a New System Image (Catalyst 2926 Series Switch)

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**Note** Software updates are distributed on Sun- and PC-compatible 3.5-inch disks.

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## Downloading a New System Image (Catalyst 2926 Series Switch)

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To download a new image into Flash memory, perform the following steps from a console, using TFTP:

**Step 1** Ensure that the workstation acting as the download server has the TFTP daemon.

**Step 2** On Sun workstations, make sure the `/etc/inetd.conf` file contains the following line:

```
tftp dgram udp wait root /usr/etc/in.tftpd in.tftpd -p -s /tftpboot
```

Make sure the `/etc/services` file contains the following line:

```
tftp 69/udp
```

---

**Note** You must restart the **inetd** daemon after modifying the `/etc/inetd.conf` and `/etc/services` files. To restart the daemon, either stop the **inetd** process and restart it, or use a **fastboot** command (on the SunOS 4.x) or a **reboot** command (on Solaris 2.x or SunOS 5.x). Refer to your workstation manual for use of TFTP daemons.

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**Step 3** Copy the new software from the floppy disks to the home directory specified for the TFTP daemon on the workstation (usually `/tftpboot`). If this directory does not exist, create it before continuing. The file you copy is `cat5000.xx.bin`, where `xx` is the software revision number.

**Step 4** Log in to the switch through the console port or through a Telnet session.

**Step 5** Enter the **download** *host file* command. Specify the IP address or host name of the workstation acting as the TFTP server. Also specify the file to download. The following is the command syntax:

```
Console> (enable) download host file
```

The following example shows how to download the file from the TFTP server:

```
Console> (enable) download 190.180.122.40 cat5000.xx.bin
```

**Step 6** When the following prompt appears, press **y**:

```
Download image filename from IP address to Module 1? (y/n) [n]? y
```

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**Note** While the software is downloading, the fan, PS1, and PS2 LEDs on the supervisor engine front panel blink green—this is normal, the switch remains operational.

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The switch erases the Flash code and reprograms the module on the supervisor engine with the downloaded Flash code.

You see the following screen display:

```
Finished network download. (1136844 bytes)
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
The system needs to be reset to run the new image.
```

**Step 7** Reset the switch.

**Step 8** Perform the following steps to verify that the new Flash code version is loaded:

- (a) Look at the supervisor engine status LEDs and verify that the interfaces return to the same state they were in before the download (some might have been shut down).
- (b) Enter the **show version** command to display the software version information.

If the new Flash code version is displayed, your installation is complete.

If a different (older) version is displayed, the old Flash code version is still loading from Flash memory.

## Downloading a New System Image Using TFTP (Catalyst 2926G Series Switch)

Use this procedure to download a software image to a Catalyst 2926G series switch:

- Step 1** Copy the software image file to the appropriate TFTP directory on the workstation (usually /tftpboot on a UNIX workstation).
- Step 2** Log into the Catalyst 2926G series switch through the console port or via a Telnet session. If you log in via Telnet, your Telnet session disconnects when you reset the switch to run the new software.
- Step 3** Download the software image from the TFTP server using the **copy tftp flash** command.

When prompted, enter the IP address or host name of the TFTP server, the name of the file to download, the Flash device to which to copy the file, and the destination filename.

The Catalyst 2926G series switch downloads the image file to the Flash device.

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**Note** The Catalyst 2926G series switch remains operational while the image downloads.

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- Step 4** Prepend the image filename to the BOOT environment variable using the **set boot system flash device:filename prepend** command, so the new image boots when you reset the switch.
- Step 5** Reset the Catalyst 2926G series switch using the **reset system** command. If you are connected to the switch via Telnet, your Telnet session disconnects.  
  
During startup, the Flash memory on the supervisor engine is reprogrammed with the new Flash code.
- Step 6** When the switch reboots, enter the **show version** command to check the version of the code on the switch.

