

Troubleshooting

This chapter describes how to identify and resolve software problems related to the IOS software. Depending on the nature of the problem, you could use the command-line interface (CLI) or Cisco Visual Switch Manager (CVSM) to identify and resolve the problem.

This chapter contains the following procedures:

- Identifying an autonegotiation mismatch
- Recovering from corrupted software
- Recovering from a lost or forgotten password
- Recovering from a failed command switch
- Maintaining connectivity with cluster members

Autonegotiation Mismatches

The IEEE 802.3u autonegotiation protocol manages the switch settings for speed (10 Mbps or 100 Mbps) and duplex (half or full). There are situations when this protocol can incorrectly align these settings, reducing performance. A mismatch occurs when

- A manually-set speed or duplex parameter is different from the manually set speed or duplex parameter on the attached port.
- A port is in autonegotiate and the attached port is set to full duplex with no autonegotiation.

To maximize switch performance and ensure a link, follow one of these guidelines when changing the settings for duplex and speed:

- Let both ports autonegotiate both speed and duplex.
- Manually set the speed and duplex parameters for the ports on both ends of the connection.

Identifying an Autonegotiation Mismatch

An autonegotiation mismatch can occur under these circumstances:

- A manually set duplex parameter is different from that set on the attached port.
- A port is set to autonegotiate and the attached port is set to full duplex with no autonegotiation.

The result of a mismatch on Fast Ethernet ports is reduced performance or link errors. For Gigabit Ethernet ports, the link does not come up, and no statistics are reported.

To identify and confirm an autonegotiation mismatch when the Fast Ethernet port is in half-duplex mode:

- Step 1** Start CVSM and select **VLAN>VLAN Membership**.
- Step 2** In the Statistics column, click **View** for the port. Check for late-collision errors.
A high number of late collisions could mean the port is connected to a port set to full-duplex mode.
- Step 3** Check the port to which this port is connected. If it is in full-duplex mode, a mismatch exists.
- Step 4** Return to the VLAN Membership page, and click **View** to check for Frame Check Sequence (FCS) errors on the full-duplex port.
- Step 5** Compare your findings with the following rules:
 - Late collisions or no link errors indicate that the half-duplex port is connected to a port set to full-duplex.
 - FCS errors indicate that the full-duplex port is connected to a port set to half duplex.

To correct mismatched port settings, follow one of these guidelines:

- Let both ports autonegotiate both speed and duplex.
- Manually set the speed and duplex parameters for the ports on both ends of the connection.

Note If a remote Fast Ethernet device does not autonegotiate, configure the duplex settings on the two ports to match. The speed parameter can adjust itself even if the connected port does not autonegotiate. To connect to a remote Gigabit Ethernet device that does not autonegotiate, disable autonegotiation on the local device, and set the duplex and flow control parameters to be compatible with the remote device.

Recovery Procedures

The recovery procedures in this section require that you have physical access to the switch. Recovery procedures include the following topics:

- Recovering from corrupted software
- Recovering from a lost or forgotten password
- Recovering from a command-switch failure

Recovering from Corrupted Software

Switch software can be corrupted during an upgrade, and it is also possible to download the wrong file. In both cases, the switch does not pass POST, and there is no connectivity.

The following procedure uses the XMODEM Protocol to recover from a corrupt or wrong image file. This procedure is largely dependent on the emulation software you are using.

- Step 1** Connect a PC with terminal emulation software supporting the XMODEM Protocol to the switch console port.
- Step 2** Set the line speed on the emulation software to 9600 baud.
- Step 3** Unplug the power cord from the back of the switch.

- Step 4** Press and hold in the Mode button, and at the same time, reconnect the power cord to the switch. You can release the Mode button a second or two after the LED above port 1X goes off. The following message appears:

```
Image not found
```

- Step 5** Although the switch did not boot, you can still use the boot loader to enter commands. Enter the **copy xmodem** boot loader command to start the transfer.

```
switch: copy xmodem: flash:image_filename
```

- Step 6** When the XMODEM request appears, use the appropriate command on the terminal-emulation software to start the transfer and copy the software image into Flash memory.

Recovering from a Lost or Forgotten Password

Follow the steps in this procedure if you have forgotten or lost the switch password.

- Step 1** Connect a terminal or PC with terminal emulation software to the console port. For more information, see the switch installation guide.

Note You can configure your switch for Telnet by following the procedure in “Configuring the Switch for Telnet” section on page 2-30.

- Step 2** Set the line speed on the emulation software to 9600 baud.
- Step 3** Unplug the power cord from the back of the switch.

- Step 4** Hold down the Mode button, and at the same time reconnect the power cord to the switch. You can release the Mode button a second or two after the LED above port 1X goes off. Several lines of information about the software appear, as do instructions:

The system has been interrupted prior to initializing the flash file system. The following commands will initialize the flash file system, and finish loading the operating system software:

```
flash_init
load_helper
boot
```

- Step 5** Enter the **flash_init** boot loader command to initialize the Flash file system:

```
switch: flash_init
```

- Step 6** If you had set the console port speed to anything other than 9600, it has been reset to that particular speed. Change the emulation software line speed to match that of the switch console port.

- Step 7** Enter the **load_helper** command to load any helper files:

```
switch: load_helper
```

- Step 8** Display the contents of Flash memory by entering the **dir** command:

```
switch: dir flash:
```

The switch file system is displayed:

Directory of flash:

```
  2  -rwx      843947  Mar 01 1993 00:02:18 C2900XL-h-mz-112.8-SA
  4  drwx       3776   Mar 01 1993 01:23:24  html
 66  -rwx        130   Jan 01 1970 00:01:19  env_vars
 68  -rwx       1296   Mar 01 1993 06:55:51  config.text
```

1728000 bytes total (456704 bytes free)

- Step 9** Rename the configuration file to config.text.old. This file contains the password definition.

```
switch: rename flash:config.text flash:config.text.old
```

Step 10 Boot the system with the **boot** command:

```
switch: boot
```

You are prompted to start the setup program. Enter **N** at the prompt:

```
Continue with the configuration dialog? [yes/no]: N
```

Step 11 At the switch prompt, change to privileged EXEC mode by entering the **enable** command:

```
switch> enable
```

Step 12 Rename the configuration file to its original name with the **rename** command:

```
switch# rename flash:config.old flash:config.text
```

Step 13 Copy the configuration file into memory with the **copy** command:

```
switch# copy flash:config.text system:running-config  
Source filename [config.text]?  
Destination filename [running-config]?
```

Press **Return** in response to the confirmation prompts.

Step 14 The configuration file is now reloaded, and you can use the normal commands to change the password. Enter the **configuration terminal** command to change to configuration mode:

```
switch# config terminal
```

Step 15 Enter the **enable password** command to change the password:

```
switch(config)# enable password string
```

where *string* is the password.

Step 16 Write the running configuration to the startup configuration file by using the **copy** command:

```
switch(config)# copy running-config startup-config
```

The new password is now included in the startup configuration.

Recovering from a Command Switch Failure

If a command switch loses power or fails in some other way, management contact with the member switches is lost and a new command switch must be installed. However, connectivity between switches that are still connected is not affected, and the member switches forward packets as usual. You can manage the members as standalone switches through the console port or, if they have IP addresses, through the other management interfaces.

You can prepare for a command switch failure by assigning an IP address to a member switch that is command-switch capable, making a note of the command-switch enable password, and cabling your cluster to provide redundant connectivity between the member switches and the backup command switch. This section describes two solutions for replacing a failed command switch:

- Replacing a failed command switch with a cluster member
- Replace a failed command switch with another switch

Replacing a Failed Command Switch with a Cluster Member

Follow these steps to replace a failed command switch with a member of the same cluster:

- Step 1** Remove the failed switch from the cluster.
- Step 2** Insert the member switch in place of the failed command switch and duplicate its connections to the cluster members.
- Step 3** Start a CLI session on the new command switch. You can access the CLI via the console port or, if an IP address has been assigned to the switch, via Telnet. See the switch installation guide for details about using the console port.
- Step 4** Enter **enable** to go to privileged EXEC mode.
- Step 5** Enter the password of the *failed command switch*.
- Step 6** From privileged EXEC mode, enter **config terminal** to change to global configuration mode.

```
Switch# config terminal  
Enter configuration commands, one per line. End with CNTL/Z.
```

- Step 7** From global configuration mode, enter **no cluster commander-address** so the switch ceases to act as a member switch.

```
Switch(config)# no cluster commander-address
```

- Step 8** Enter **exit** to return to privileged EXEC mode.

- Step 9** Use the setup program to configure the switch IP information. This program prompts you for an IP address, subnet mask, default gateway, and password. From privileged EXEC mode, enter **setup** and press **Return**.

```
Switch# setup
```

```
--- System Configuration Dialog ---
```

```
At any point you may enter a question mark '?' for help.
```

```
Use ctrl-c to abort configuration dialog at any prompt.
```

```
Default settings are in square brackets '[]'.
```

```
Continue with configuration dialog? [yes/no]:
```

- Step 10** Enter **Y** at the first prompt:

```
Continue with configuration dialog? [yes/no]: y
```

If this prompt does not appear, enter **enable**, and press Return. Enter **setup** and press **Return** to start the setup program.

- Step 11** Enter the switch IP address, and press **Return**:

```
Enter IP address: ip_address
```

- Step 12** Enter the subnet mask (IP netmask) address, and press **Return**:

```
Enter IP netmask: ip_netmask
```

- Step 13** Enter **Y** to enter a default gateway (router) address:

```
Would you like to enter a default gateway address? [yes]: y
```

- Step 14** Enter the IP address of the default gateway (router), and press **Return**:

```
Enter router IP address: IP_address
```

- Step 15** Enter a host name, and press **Return**:

```
Enter host name: host_name
```

Step 16 Enter the password of the failed command switch again, and press **Return**:

```
Enter enable secret password: secret_password
```

The initial configuration displays:

The following configuration command script was created:

```
interface VLAN1
ip address IP_address IP_netmask
ip default-gateway IP_address
enable secret 5 $1$jJq1$VA6U.6uTjsa56Xx2yy/t30
snmp community private rw
snmp community public ro
!
end
!
```

Use this configuration? [yes/no]:

Step 17 Verify that the addresses are correct.

Step 18 Enter **Y**, and press **Return** if the displayed information is correct. If this information is not correct, enter **N**, press **Return**, and begin again at Step 9.

Step 19 Start your browser and enter the IP address you just entered for the switch.

Step 20 Display the CVSM Home page for the switch, and select **Enabled** from the Command Switch drop-down menu.

Step 21 Display Cluster Builder. It will prompt you to add candidate switches. The password of the failed command switch is still valid for the cluster, and you should enter it when candidate switches are proposed for cluster membership.

Note You can also add switches to the cluster via the CLI. See the “CLI Commands for Creating a Cluster” section on page 4-6 for the complete instructions.

Replacing a Failed Command Switch with Another Switch

Follow these steps when you are replacing a failed command switch with a switch that was not part of the cluster:

- Step 1** Insert the new switch in place of the failed command switch and duplicate its connections to the cluster members.
- Step 2** Start a CLI session on the new command switch. You can access the CLI via the console port or, if an IP address has been assigned to the switch, via Telnet. See the switch installation guide for details about using the console port.
- Step 3** Enter **enable** to go to privileged EXEC mode.
- Step 4** Enter the enable password of the *failed command switch*.
- Step 5** Use the setup program to configure the switch IP information. This program prompts you for an IP address, subnet mask, default gateway, and password. From privileged EXEC mode, enter **setup** and press **Return**.

```
Switch# setup
```

```
--- System Configuration Dialog ---
```

```
At any point you may enter a question mark '?' for help.  
Use ctrl-c to abort configuration dialog at any prompt.  
Default settings are in square brackets '['].
```

```
Continue with configuration dialog? [yes/no]:
```

- Step 6** Enter **Y** at the first prompt:

```
Continue with configuration dialog? [yes/no]: y
```

If this prompt does not appear, enter **enable**, and press Return. Enter **setup** and press **Return** to start the setup program.

- Step 7** Enter the switch IP address, and press **Return**:

```
Enter IP address: ip_address
```

- Step 8** Enter the subnet mask (IP netmask) address, and press **Return**:

```
Enter IP netmask: ip_netmask
```

- Step 9** Enter **Y** to enter a default gateway (router) address:

```
Would you like to enter a default gateway address? [yes]: y
```

- Step 10** Enter the IP address of the default gateway (router), and press **Return**:

Enter router IP address: *IP_address*

Step 11 Enter a host name, and press **Return**:

Enter host name: *host_name*

Step 12 Enter the password of the failed command switch again, and press **Return**:

Enter enable secret password: *secret_password*

The initial configuration displays:

The following configuration command script was created:

```
interface VLAN1
ip address IP_address IP_netmask
ip default-gateway IP_address
enable secret 5 $1$jJql$VA6U.6uTjsa56Xx2yy/t30
snmp community private rw
snmp community public ro
!
end
!
```

Use this configuration? [yes/no]:

Step 13 Verify that the addresses are correct.

Step 14 Enter **Y**, and press **Return** if the displayed information is correct. If this information is not correct, enter **N**, press **Return**, and begin again at Step 5.

Step 15 Start your browser and enter the IP address you just entered for the switch.

Step 16 Display the CVSM Home page for the switch, and select **Enabled** from the Command Switch drop-down menu.

Step 17 Click **Cluster Management** and display Cluster Builder. It prompts you to add the candidate switches. The password of the failed command switch is still valid for the cluster. Enter it when candidate switches are proposed for cluster membership, and click **OK**.

Note You can also add switches to the cluster via the CLI. See the “CLI Commands for Creating a Cluster” section on page 4-6 for the complete instructions.

Recovering from Lost Member Connectivity

Some configurations can prevent the command switch from maintaining contact with member switches. If you are unable to maintain management contact with a member, and the member switch is forwarding packets normally, check for the following port-configuration conflicts:

- Member switches cannot connect to the command switch through a port that is defined as a network port. For information on the network port feature, see the “Enabling a Network Port” section on page 3-28.
- Member switches must connect to the command switch through a port that belongs to VLAN 1. You can check VLAN membership on the VLAN Membership page described in the “Assigning Ports to VLANs” section on page 3-74.
- Member switches connected to the command switch through a secured port can lose connectivity if the port is disabled due to a security violation. Secured ports are described in the “Enabling Port Security” section on page 3-56.