CHAPTER 5

Configuring the Software

This chapter discusses the initial configuration of the Catalyst 2900 and describes how you configure such functions as IP addressing and SNMP management. An IP address must be assigned if you need to use Telnet to connect to the switch or use SNMP network management for the switch. Up to eight simultaneous Telnet sessions are possible. If your Telnet station or SNMP network management workstation is on a different network from the switch, a static routing table entry must also be added to the routing table. Use the **set ip route** command to set the static routing table entry.

Note For definitions of all commands discussed in this chapter, refer to the "Command Reference" chapter of the publication *Catalyst 2900 Configuration Guide and Command Reference.*

Before You Begin

Before you can begin your configuration, you will need the following information:

- Interface type
  - sc0: Use this interface type when assigning the Catalyst 2900 IP address.
  - sl0: Use this interface type when configuring a SLIP connection on the switch.

Note After SLIP is enabled and attached on the Administrative port, an EIA/TIA-232 terminal cannot access the Catalyst 2900 through this port.

- IP address
- Netmask address
- Broadcast address (optional)
- VLAN number. By default, 1

Configuration Task List

To initially configure the Catalyst 2900, perform the following tasks:

- Establish the Administrative Connection
- Set the System Information
- Set the Interface Type
- Test the Configuration (optional)
- Configure SLIP on the Administrative Port
- Create a BOOTP Server
- Configure SNMP Management
- Test the Configuration

You configure the switch through the administrative interface using three basic types of commands: **set**, **show**, and **clear**. Use the **set** commands to establish switch parameters. After each **set** command, use the **show** command to verify that you have entered the correct values and configured the switch correctly. If you make errors, use the **set** or **clear** command to overwrite or erase the parameter.

For a list of available commands, type **set help**, **show help**, or **clear help**. To display the command usage, type the command and the word **help**, as the following example shows:

```
Console> (enable) set spantree hello help
Usage: set spantree hello <interval> [vlan]
       (interval = 1..10, vlan = 1..1000)
```

Establish the Administrative Connection

After installing and connecting the switch, perform the following tasks to start up and access the switch.

Task	Command
Plug in the switch and turn ON the power to the console terminal. The information shown in Figure 5-1 appears on the screen.	**None**
Access the administrative interface using the console terminal.	**None**
At the Enter password prompt, press **Return.**	**None**
Enter privileged mode.	**enable**
At the Enter password prompt, press **Return**.	**None**

Figure 5-1 Initial Bootup Example

```
Catalyst 2900 Power Up Diagnostics

Init NVRAM Log
LED Test
ROM CHKSUM
DUAL PORT RAM r/w
RAM r/w
RAM address test
Byte/Word Enable test
EARL test
EARL test Done

BOOTROM Version 2.1, Dated Mar 8 1996 16:24:38 BOOT date: 04/11/96 BOOT
time: 15:17:12

IP address for Catalyst 2900 not configured BOOTP will commence after the
ports are online Ports are coming online ...

Cisco Systems Console

Enter password:
```

Set the System Information

Although not required, several system parameters should be set as part of the initial system setup. To set the system parameters, perform the following tasks in privileged mode:

Task	Command
Set the system contact.	**set system contact** *contact_string*
Set the system location string.	**set system location** *location_string*
Set the system name.	**set system name** *name_string*
Set the system clock.	**set time** *day_of_week mm/dd/yy hh:mm:ss*
Set the system prompt.	**set prompt** *prompt_string*
Set password protection for entering the administrative interface in normal mode.	**set password**
Set password protection for entering the administrative interface in privileged mode.	**set enablepass**

Set the Interface Type

To set the interface type, perform the following steps in privileged mode. Enter privileged mode by typing **enable** at the command prompt.

Task	Command
If you are using a local network connection to the administrative interface, set sc0.	**set interface sc0 up** **set interface sc0** *ip_address [netmask [broadcast]]*
If you are using a SLIP connection to the administrative interface, set sl0.	**set interface sl0 up** **set interface** *slip_address dest_address*
Configure static routes. For example, you need to configure static routes if your Telnet station or SNMP network management workstation is on a different network from the switch.	**set ip route** *destination gateway* [***metric***]
Configure a default route, if desired.	**set ip route** *destination gateway metric*
Check the status of the configuration of the switch. See Figure 5-2 for an example.	**show interface**
Display the route table entries of the configuration. See Figure 5-3 for an example.	**show ip route**

Figure 5-2 show interface Command Example

```
Console> (enable) show interface
sl0:  flags=10<DOWN,POINTOPOINT>
         inet 0.0.0.0 netmask 0.0.0.0 broadcast 0.0.0.0
sc0:  flags=863<UP,BROADCAST,RUNNING>
        inet 192.22.74.223 netmask 255.255.255.0 broadcast 192.22.74.255
Console> (enable)
```

Figure 5-3 show route Command Example

```
Console> (enable) show ip route
Redirect
--------
enabled

Destination     Gateway         Flags   Use         Interface
--------------- --------------- ------  ----------  ---------
default         192.22.74.102   UG           59444  sc0
192.22.74.0     192.22.74.220   U                5  sc0
171.69.194.18   192.22.74.200   UGHDM       938427  sc0
171.69.194.181  192.22.74.200   UGHD         75065  sc0
Console> (enable)
```

Configure SLIP on the Administrative Port

To configure the Administrative port for SLIP, perform the following tasks:

Task	Command
Access the switch from a remote host with Telnet.	**None**
Enable the serial line interface protocol for the console port.	**slip attach**

Caution The SLIP connection *must* use the serial line (Administrative port), and this connection will cause you to lose your serial connection while the SLIP connection is active. If you are connected to the administrative interface through the serial port and you enter the **slip attach** command, you will lose the serial connection. In that case, use Telnet to access the administrative interface, enter privileged mode, and type **slip detach** to restore the console port, or reset the switch.

Create a BOOTP Server

IP address information can be set using BOOTP protocol. You can configure a BOOTP server with the MAC and IP addresses of the switch. Then the switch boots, and it automatically retrieves the IP address from the BOOTP server.

The switch performs a BOOTP request *only* if the current IP address is set to 0.0.0.0. (This is the default for a new switch or a switch that has had its configuration file cleared using the **clear config all** command.)

To configure a workstation as a BOOTP server, you must determine the MAC address of the switch, and add that MAC address to the BOOTP configuration file on the server. The following steps provide an example of creating a BOOTP server on a Sun workstation:

Task	Command
Install the BOOTP server code on the workstation, if it is not already installed.	**None**
Obtain the first address in the MAC address range for module 1 (the supervisor module). Figure 5-4 shows an example of the **show config** command output. In this example, the first MAC address shown for module 1 is 00-04-0b-90-b5-00.	**show config**
Add an entry in the BOOTP configuration file (usually */usr/etc/bootptab*) for each Catalyst 2900. Press **Return** after each entry to create a blank line between each entry. In the example in Figure 5-5, `ht` is hardware type, `ha` is hardware address (use the first address in the MAC address range), `sm` is the network subnet mask, and `ip` is IP address.	**None**

Figure 5-4 show config Command Example

```
Console> (enable) show module
Mod Module-Name          Ports Model    Serial-Num Hw     Fw     Sw     Status
--- -------------------- ----- -------- ---------- ------ ------ ------ --------
1                        2     WS-X2900 000102691  1.8 2.1 2.1 ok
2                        12 WS-X2901 000095702  1.0 1.4 2.1 ok
Mod MAC-Address(es)
--- ----------------------------------------
1   00-40-0b-90-b5-00 thru 00-40-0b-90-b8-ff
2   00-40-0b-30-04-f8 thru 00-40-0b-30-05-0f
Console> (enable)
```

Figure 5-5 BOOTP Configuration File Example

```
catalyst-1:\

ht=ether:\

ha=0040b90b500:\

sm=255.255.255.0:\

ip=197.22.74.223
```

Configure SNMP Management

SNMP, an application-layer protocol, facilitates the exchange of MIBs between network devices. SNMP community strings authenticate access to the MIB and function as embedded "passwords." For an SNMP message to be processed, the community string must match one of following three community-string modes configured in the switch:

- Read-only—This mode gives read access to all objects in the MIB except the community strings, but does not allow write access.
- Read-write—This mode gives read and write access to all objects in the MIB, but does not allow access to the community strings.
- Read-write all—This mode gives read and write access to all objects in the MIB, including the community strings.

When the switch resets or detects an incorrect community string, it sends a trap (or notification message) to a station. The **set snmp trap** command enters the IP address of the receiving station into the trap receiver table, which can hold up to ten addresses. When you enter addresses in the table, you must specify the community string that will appear in the trap message. You can control whether or not the switch issues an authentication trap by using the **set snmp trap enable** or **set snmp trap disable** command.

To configure the switch to be managed using an SNMP network management workstation, perform the following tasks:

Task	Command
Configure the SNMP community strings.	**set snmp community read-only | read-write | read-write-all** *community_string*
Assign a trap receiver address and community. If you enter incorrect information, use the **clear snmp trap** command to delete the entry. Then reenter the **set snmp trap** command.	**set snmp trap** *rcvr_address rcvr_community*
If desired, configure the switch so that it issues an authentication trap.	**set snmp trap enable**

Test the Configuration

After you have configured the IP addresses, test for connectivity between the switch and a host. The host can reside anywhere in your network. To test for connectivity, perform the following tasks:

Task	Command
Test the configuration using the **ping** command. The **ping** command sends an echo request to the host specified in the command line.	**ping** *host*
If necessary, reset the configuration to its default values and reenter the configuration information.	**clear config**

Note The host must be connected to a port with an address on the same IP network, or you must configure a static route entry to reach the host network. Refer to the **set ip route** command in the "Switch Command Reference" chapter of the publication *Catalyst 2900 Configuration Guide and Command Reference.*

For example, to test connectivity from the switch to a workstation with an IP address of 192.34.56.5, enter the command **ping 192.34.56.5**. If the switch receives a response, the following message is displayed:

```
192.34.56.5 is alive
```

Note Parameters set through the administrative interface remain set even if you disconnect power to the switch. The **clear config all** command returns all parameters to their default values.

Upgrading the Software

This section describes how to update the software on the Catalyst 2900. New software to implement enhancements and maintenance releases will be provided periodically. The following are two methods you can use to update the software:

- Initiate the network download using a TFTP download server.
- Use Kermit (a popular file-transfer and terminal-emulation program) to network download the software from a PC or workstation attached to the switch using the console port. This public domain UNIX program is supplied on the software update disk.

Note Software updates are distributed on Sun- and PC-compatible 3.5-inch disks. Use the procedures in this chapter to copy the software from the disks and download the software from the workstation to the switch. For more information on configuration commands, refer to the *Catalyst 2900 Configuration Guide and Command Reference.*

Copying to Flash Memory

You may need to copy a new image to Flash memory whenever a new image or maintenance release becomes available. To copy a new image into Flash memory (write to Flash memory), you must first reboot from ROM and then copy the new image into Flash memory. Use the **copy tftp flash** command for the copy procedure.

The following are two sample displays, one from a telnet session and the other from the console, for reloading the switch and then copying a file (called `c2900_spv11.bin`) to Flash memory from a TFTP server (called torus):

```
Console> (enable) copy
Usage: copy tftp flash
       copy flash tftp
```

Sample Telnet session:

```
Console> (enable) copy tftp flash
IP address or name of host? torus
Name of file to copy from? c2900_spvXX.bin
Module number to copy image to [1]? 2
Download image c2900 FEXX.bin from torus to Module 2 (y/n) [n]? y/
Done.  Finished Network Download.  (1409302 bytes)
Console> (enable)
```

Sample console session:

```
Console> (enable) copy flash tftp
IP address or name of host? torus
Name of file to copy to? c2900_spvXX.bin
Module number to copy image from [1]? 2
Upload supervisor image on Module 1 to c2900_spvXX.bin on torus (y/n) [n]?
y
/
Done.  Finished Network Upload.  (409604 bytes)
Console> (enable)
```

The system is now ready to be configured to boot from the new image you copied to Flash memory. For more information on the **copy tftp flash** command and other related commands, refer to the publication *Catalyst 2900 Configuration Guide and Command Reference.*