CLI Navigation

This lab covers the most basic skills for accessing and using the command-line interface (CLI) on a Cisco router or switch. Many of the small, picky details of how the CLI works cannot be seen by reading a book; this lab hopes to complete the coverage of those basics. In particular, the objectives of this lab are as follows:

- Use IOS CLI help features
- Describe the differences between user, enable, and config modes
- Describe the difference between EXEC commands and configuration commands
- Move among user, enable, and configuration modes

Scenario

This lab contains two main steps. The first step focuses on the basics of the CLI, and the second step examines different CLI modes and how to move between them. The video takes the following actions at the two steps:

Step 1. From the console port, the user logs in to a router and experiments with user EXEC mode. This step shows how to get command-line help.

Step 2. The user moves among user EXEC mode, privileged (enable) EXEC mode, and configuration mode. This step demonstrates some commands that might be allowed only in a particular mode.

Initial Configurations

Many labs in the CVIP have meaningful initial configurations. If you use this lab at the suggested point in your study, you will not yet have seen some of the configurations. However, for completeness, Example 1-1 shows the initial configuration of router R1 at the beginning of the lab. The parts of R1's configuration that are not relevant to this lab have been omitted.

Example 1-1 Initial Configuration for R1

```
hostname R1
```

Ending Configurations

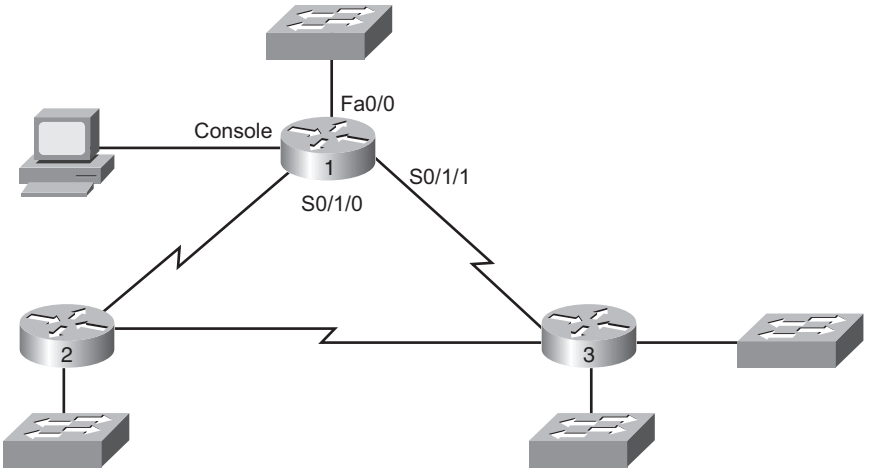
This lab ends with the configuration unchanged.

Video Presentation Reference

The video presents figures, tables, and text with short lectures before showing the CLI of the router. This section simply lists these figures and tables for reference.

Figure 1-1 shows a diagram of the network used in this example.

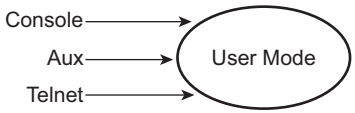
Figure 1-1 Lab 1 Network Topology



Because the video is organized into two separate steps, the reference materials have been organized into two separate sections.

Step 1 Reference

Figure 1-2 Figure for Step 1



- User EXEC Mode Facts:
  - First mode seen by users connected from the console port, aux port, and Telnet.
  - User can type harmless EXEC commands.
  - Characterized by a “>” at the end of the command prompt.

Step 2 Reference

Figure 1-3 Figure for Step 2

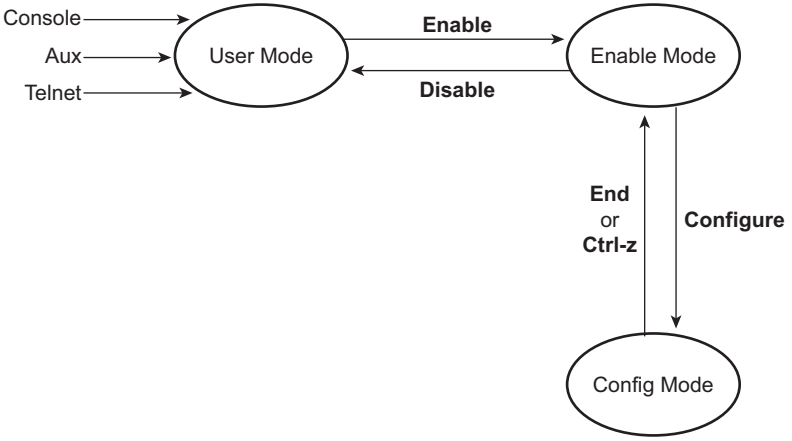


Table 1-1 Comparing EXEC and Config Commands

	EXEC Commands	Config Commands
Mode in which they are used	User or enable	Config
Cisco IOS Software typically responds with a list of messages	Yes	No
Command changes the configuration and behavior of router/switch	No	Yes

Table 1-2 Three Commands That Can Be Used in Different CLI Modes

Command	Modes in Which It Works
show ip route	User, enable
reload	Enable
hostname	Config

Router Configuration

This lab demonstrates the mechanics of configuring a Cisco router and how to copy configuration files. The objectives of this lab are the following:

- Describe the configuration process using different configuration modes
- Recognize the *command prompts* seen in different configuration modes
- Copy configuration files using the **copy** command

Scenario

This lab contains two primary steps. The first step focuses on an example of moving around in configuration mode, with the goal of explaining the process rather than the specific commands. The second step focuses on how to copy configuration files on a Cisco router. The video references these two main steps as follows:

Step 1. Using configuration mode

Step 2. Viewing and copying configuration files in NVRAM, RAM, and TFTP servers

Initial Configurations

The only router shown in this video begins with almost no configuration other than a host name. Example 2-1 lists the hostname configuration for reference.

Example 2-1 Initial Configuration for Router R1

```
hostname R1
```

Ending Configurations

By the end of the lab, R1's running and startup configuration files should be identical. The video also shows a couple of other configuration items. Example 2-2 lists the ending configuration after all steps in the lab.

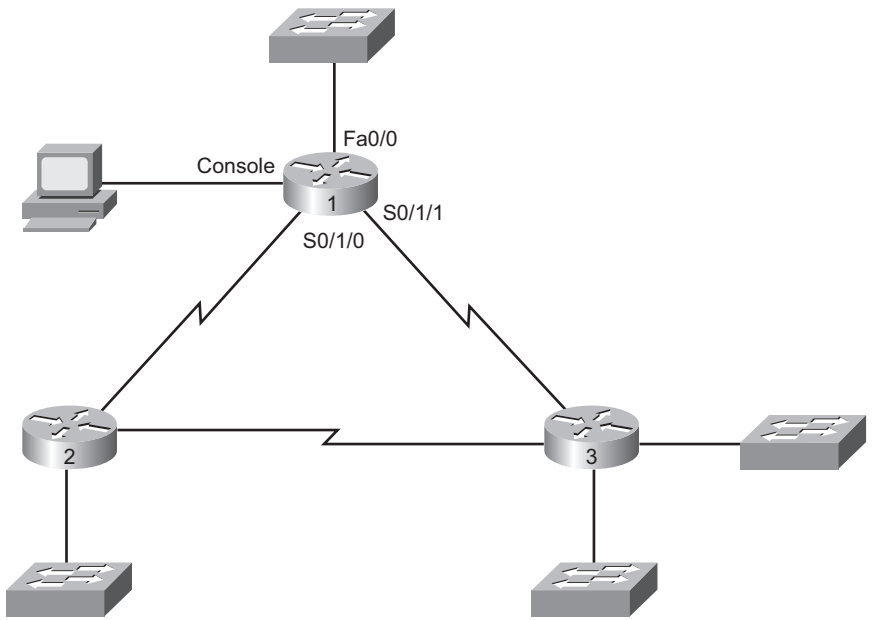
Example 2-2 Ending Configuration for R1

```
hostname Fred
!
interface serial 0/1/0
 ip address 1.1.1.1 255.255.255.0
!
line con 0
 password cisco
 login
```

Video Presentation Reference

The video presents figures, tables, and text with short lectures before showing the CLI of the router. This section simply lists these figures and tables for reference. Figure 2-1 shows a diagram of the network used in this example.

Figure 2-1 Lab 2 Network Topology



Because the video is organized into two separate steps, the reference materials have been organized into two separate sections.

Step 1 Reference

Figure 2-2 Accessing a Router's Config Mode

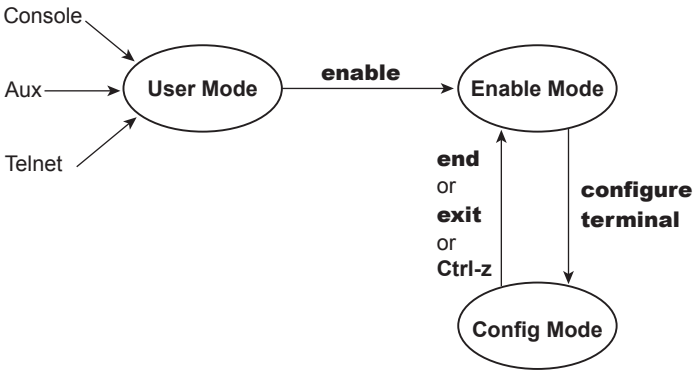
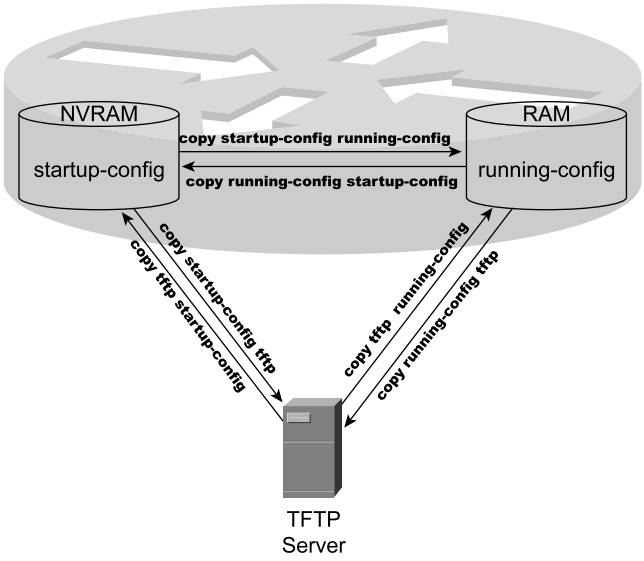


Table 2-1 Example Configuration Sub-modes

Name of Sub-mode	Purpose	Command Prompt
Interface	Configures details about a specific router interface, such as the IP address	Router(config-if)#
Line	Configures details about lines (console, vty, and aux)	Router(config-line)#
Router	Configures details about a particular routing protocol	Router(config-router)#

Step 2 Reference

Figure 2-3 Mechanics of the copy Command



Lab 3

Switch Basics

This lab reviews the logic of how switches learn entries for their MAC address tables and make forwarding and filtering decisions based on those tables; it also shows some of the most basic configuration settings on a Cisco LAN switch. In particular, the objectives of this lab are as follows:

- Predict the types of entries to be found in a switch's *MAC address table*
- Describe how switches make forwarding/filtering decisions
- Configure the following:
  - Interface speed and duplex settings
  - Switch IP address and default gateway

Scenario

This lab contains two main steps, as follows:

Step 1. Observe the addition of new MAC address table entries

Step 2. Configure basic settings:

- Interface speed and duplex
- IP address and default gateway

Initial Configurations

The two switches in this lab begin with very little configuration—each switch simply has a hostname configured. Examples 3-1 and 3-2 list the hostname configurations for completeness.

Example 3-1 Initial Configuration for Sw1

```
hostname Sw1
```

Example 3-2 Initial Configuration for Sw2

```
hostname Sw2
```

Ending Configurations

This lab adds some configuration commands to both Sw1 and Sw2. Examples 3-3 and 3-4 show the configuration added during the lab.

Example 3-3 Configuration on Sw1 Added During This Lab

```
enable secret cisco
!
interface FastEthernet 0/23
 duplex full
 speed 100
!
interface vlan 1
 ip address 172.30.1.101 255.255.255.0
!
ip default-gateway 172.30.1.251
!
```

Example 3-4 Configuration on Sw2 Added During This Lab

```
interface FastEthernet 0/24
 duplex full
 speed 100

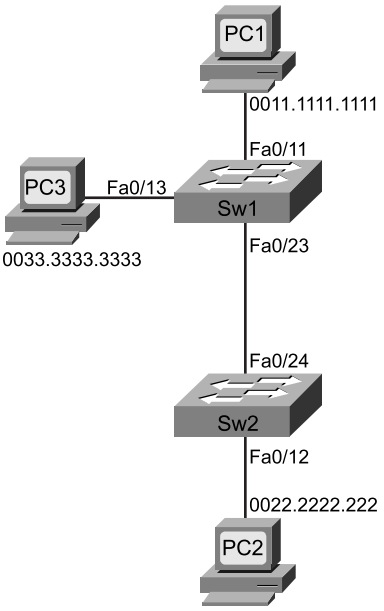
!
interface vlan 1
 ip address 172.30.1.102 255.255.255.0
!
ip default-gateway 172.30.1.251
```

Video Presentation Reference

This video presents several figures and a table that support the concepts covered in the lab. This section simply lists these figures for reference. Because the video is organized into two separate steps, the reference materials have been organized into two separate sections.

Step 1 Reference

Figure 3-1 Completed MAC Address Tables After Learning All PC MAC Addresses



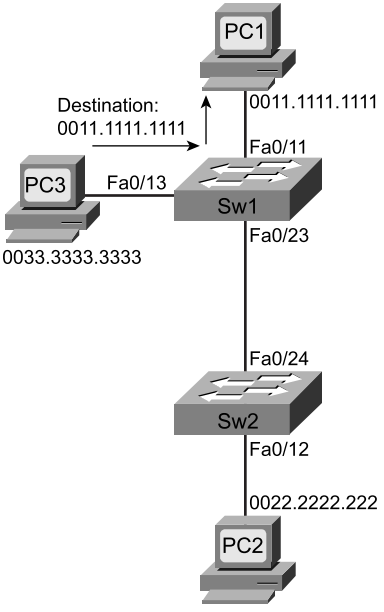
Sw1 MAC Address Table

Address	Interface
0033.3333.3333	Fa0/13
0011.1111.1111	Fa0/11
0022.2222.2222	Fa0/23

Sw2 MAC Address Table

Address	Interface
0033.3333.3333	Fa0/24
0011.1111.1111	Fa0/24
0022.2222.2222	Fa0/12

Figure 3-2 Forwarding Path and MAC Address Table Entries Used for Frames from PC3 to PC1



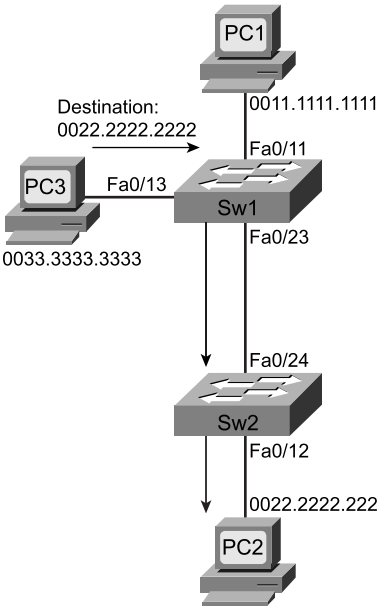
Sw1 MAC Address Table

Address	Interface
0033.3333.3333	Fa0/13
0011.1111.1111	Fa0/11
0022.2222.2222	Fa0/23

Sw2 MAC Address Table

Address	Interface
0033.3333.3333	Fa0/24
0011.1111.1111	Fa0/24
0022.2222.2222	Fa0/12

Figure 3-3 **Forwarding Path and MAC Address Table Entries Used for Frames from PC3 to PC2**



Sw1 MAC Address Table

Address	Interface
0033.3333.3333	Fa0/13
0011.1111.1111	Fa0/11
0022.2222.2222	Fa0/23

Sw2 MAC Address Table

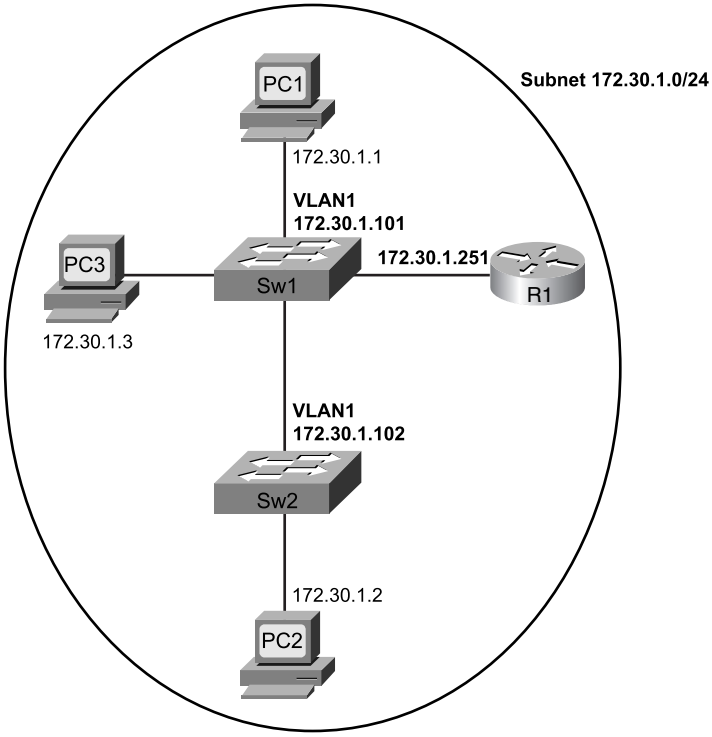
Address	Interface
0033.3333.3333	Fa0/24
0011.1111.1111	Fa0/24
0022.2222.2222	Fa0/12

Step 2 Reference

Table 3-1 **Switch Configuration Command Reference**

Command	Purpose
interface fastethernet *x/y*	Moves the user into interface configuration mode
speed {**10** | **100**}	Manually sets the speed of the interface
duplex {**half** | **full**}	Manually sets the duplex of an interface
interface vlan 1	Moves the user to VLAN 1 configuration mode
ip address *address mask*	Allows the configuration of a management IP address on the switch
ip default-gateway *address*	Defines the switch's default gateway IP address

Figure 3-4 IP Address Reference



Lab 4

VLANs

This lab shows how to use the commands required to configure virtual LANs (VLANs) on Cisco IOS Software-based switches, in addition to a few of the commands used to examine VLAN operations. In particular, the objectives of this lab are as follows:

- Configure VLANs on Cisco switches
- Configure the VTP mode on Cisco switches
- Determine the status of VLAN trunks
- Configure 802.1Q trunking between two Cisco switches

Scenario

This lab contains two main steps, as follows:

Step 1. Use a *three-step process* to create the first VLAN on a switch:

Configure VTP mode

Create a VLAN

Add interfaces to that VLAN

Step 2. Examine and configure *802.1Q trunking* between two switches

Initial Configurations

The two switches in this lab begin with some basic configuration. First, host switches have their host-names configured. Second, the switch ports connected to the PCs have been configured to use the **spanning-tree portfast** command, which causes these end-user ports not to wait on Spanning Tree Protocol (STP) timers when the ports are administratively enabled. However, all VLAN configurations has been removed before this lab begins. Examples 4-1 and 4-2 show the basic initial configurations for both switches in this lab.

Example 4-1 Initial Configuration for Sw1

```
hostname Sw1
!
interface FastEthernet 0/11
 spanning-tree portfast
!
interface FastEthernet 0/13
```

Example 4-1 Initial Configuration for Sw1 *continued*

```
 spanning-tree portfast
!
interface vlan 1
 ip address 172.30.1.101 255.255.255.0
 no shutdown
!
ip default-gateway 172.30.1.251
```

Example 4-2 Initial Configuration for Sw2

```
hostname Sw2
!
interface FastEthernet 0/12
 spanning-tree portfast
!
interface vlan 1
 ip address 172.30.1.102 255.255.255.0
 no shutdown
!
ip default-gateway 172.30.1.251
```

Ending Configurations

This lab adds some configuration commands to both Sw1 and Sw2; however, it does not change any of the earlier configurations. Examples 4-3 and 4-4 show the configuration added during the lab.

Example 4-3 Configuration on Sw1 Added During this Lab

```
vtp transparent
!
vlan 11
 name thisisvlan11
!
interface FastEthernet 0/11
 switchport access vlan 11
!
interface FastEthernet 0/13
 switchport access vlan 11
!
interface FastEthernet 0/23
 switchport mode trunk
```

Example 4-4 Configuration on Sw2 Added During this Lab

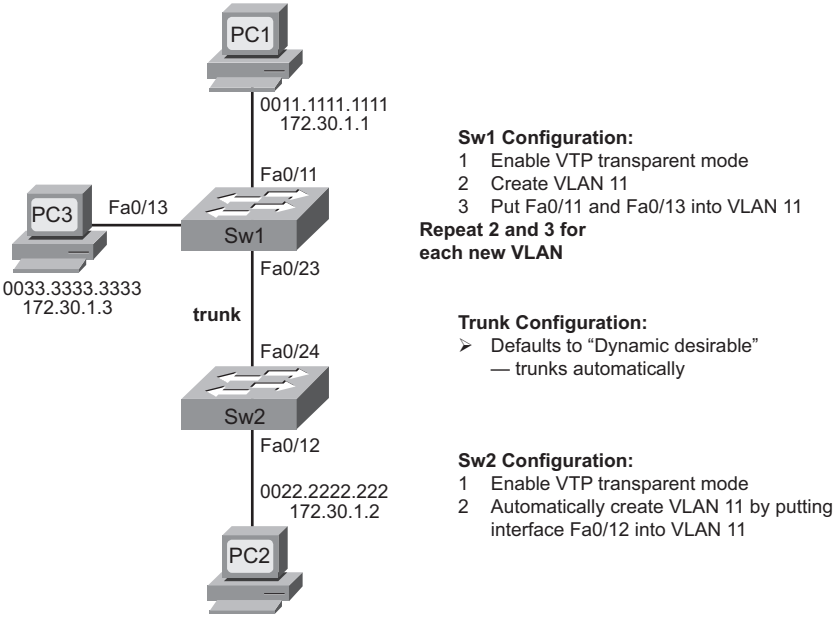
```
vtp transparent
!
vlan 11
!
interface FastEthernet 0/12
 switchport access vlan 11
```

Video Presentation Reference

This video presents several figures and a table that support the concepts covered in the lab. This section simply lists these figures for reference. Because the video is organized into three separate steps, the reference materials have been organized into three separate sections.

Step 1 Reference

Figure 4-1 Step 1 Topology and Configuration Steps



Step 2 Reference

Table 4-1 The Meaning of the *type* Option of the switchport mode Command

Value of the *type* Keyword	Meaning of the *type* Keyword
access	Always do *not* trunk
trunk	Always trunk
dynamic desirable	Negotiate whether to trunk or not and initiate the process
dynamic auto	Negotiate whether to trunk or not but do not initiate the process

Table 4-2 Trunk Configuration Options for Making Two LAN Switches Trunk

SW1 Configuration for Trunking Mode	Required Setting on SW2 to Trunk
access	None—cannot trunk
trunk	Trunk, dynamic desirable, or dynamic auto
dynamic desirable	Trunk, dynamic desirable, or dynamic auto
dynamic auto	Trunk or dynamic desirable