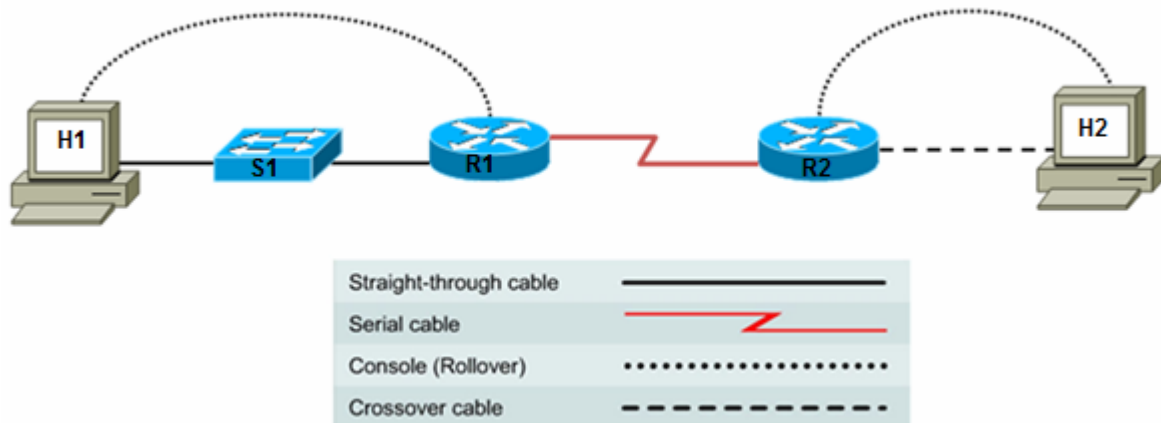


Lab 5.3.9a Managing Router Configuration Files Using HyperTerminal



Device	Host Name	Interface	IP Address	Subnet Mask
R1	R1	Serial 0/0/0 (DCE)	172.17.0.1	255.255.0.0
		FastEthernet 0/0	172.16.0.1	255.255.0.0
R2	R2	Serial 0/0/0 (DTE)	172.17.0.2	255.255.0.0
		FastEthernet 0/0	172.18.0.1	255.255.0.0

Objectives

- Establish a HyperTerminal session with a router, and use it to capture and save the running configuration as a text file for use as a backup.
- Edit the file using the Notepad text editor, and use HyperTerminal to restore the backup configuration to the router.
- Modify the file using Notepad, and use HyperTerminal to transfer the file and configure a different router.
- Verify network connectivity.

Background / Preparation

The HyperTerminal capture option can be very useful, not only for configuration files but for capturing command output and documentation purposes. It is a simple way to save whatever is displayed on the screen of the PC acting as a console to the router.

In this lab, you build a multi-router network and configure one of the routers. You will capture the running-config to a text file using HyperTerminal, and then edit the file using the Notepad text editor so that it can be used as a backup for the first router. You will then modify the file so that it can be used to configure the second router.

Set up a network similar to the one in the topology diagram. Any router that meets the interface requirements displayed in that diagram—such as 800, 1600, 1700, 1800, 2500, or 2600 routers, or a combination of these—can be used. See the Router Interface Summary table at the end of the lab to determine which interface identifiers to use based on the equipment in the lab. Depending on the model of the router, output may vary from what is shown in this lab.

Required Resources

The following resources are required:

- Two routers, each with an Ethernet and serial interface
- Two Windows XP computers
- Straight-through Category 5 Ethernet cable (H1 to switch)
- Crossover Category 5 Ethernet cable (H2 to router R2)
- Null serial cable
- Console cables (from H1 and H2 to routers R1 and R2)
- Access to the computer host command prompt
- Access to the computer host network TCP/IP configuration

From each computer, start a HyperTerminal session to the attached router.

Note: Make sure that the routers and the switches have been erased and have no startup configurations. Instructions for erasing are provided in the Lab Manual, located on Academy Connection in the Tools section. Check with the instructor if you are unsure of how to do this.

Step 1: Configure host IP settings.

- Make sure that the hosts are connected according to the topology diagram.
- Configure static IP addresses on both hosts using the following settings.

Host H1:

IP address: 172.16.0.2
Subnet mask: 255.255.0.0
Default gateway: 172.16.0.1

Host H2:

IP address: 172.18.0.2
Subnet mask: 255.255.0.0
Default gateway: 172.18.0.1

Step 2: Log in to router R1 and configure the basic settings.

- Configure the host name for R1.

```
Router>enable
Router#configure terminal
Router(config)#hostname R1
```

- Configure console, vty, and enable secret passwords. Configure synchronous logging for the console line.

```
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#logging synchronous
R1(config-line)#line vty 0 4
R1(config-line)#password cisco
R1(config-line)#login
```

```
R1(config-line)#exit
R1(config)#enable secret class
R1(config)#exit
```

- c. Configure a message-of-the-day (MOTD) banner and no ip domain lookup.

```
R1(config)#banner motd #Unauthorized Use Prohibited#
R1(config)#no ip domain lookup
```

- d. Configure the R1 Fast Ethernet and serial interfaces.

```
R1(config)#interface serial 0/0/0
R1(config-if)#description WAN link to R2
R1(config-if)#ip address 172.17.0.1 255.255.0.0
R1(config-if)#clock rate 64000
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#interface FastEthernet 0/0
R1(config-if)#description R1 LAN Default Gateway
R1(config-if)#ip address 172.16.0.1 255.255.0.0
R1(config-if)#no shutdown
R1(config-if)#end
```

Step 3: Display the R1 router configuration.

Issue the **show running-config** command in privileged EXEC mode, and verify all the configuration commands that you have entered. Note that this command can be abbreviated as **sh run**.

```
R1#show running-config
```

Step 4: Save the configuration on R1.

Save the running configuration to the startup configuration from the privileged EXEC prompt.

```
R1#copy running-config startup-config
```

Note: Save the running configuration for the next time that the router is restarted. The router can be restarted either by a software **reload** command or a power cycle. The running configuration will be lost if it is not saved. The router uses the startup configuration when the router is started.

Step 5: Start capturing the running configuration file.

- Clear the screen using the **Edit > Clear Screen** and the **Edit > Clear Backscroll** options from the HyperTerminal main menu. This is not required to capture the file, but makes it easier to see what you are doing.
- Use HyperTerminal to capture all text displayed on the screen to a text file by choosing **Transfer > Capture Text**.
- Specify the name of the router plus you initials for the filename and use .txt for the extension. For example, R1-XYZ.txt, where XYZ are your initials. Browse to where you want to save the file. You will edit this file later in this lab.

Write down the name and location where you saved this file: _____

- Click the **Start** button to start capturing text.
- Enter the **show running-config** command from privileged EXEC mode. This command displays the active configuration file for the router that is stored in RAM. Press the space bar when the "- More -" prompt appears.

Step 6: Stop capturing the configuration file.

To discontinue capturing the output, from the HyperTerminal menu, choose **Transfer > Capture Text > Stop**.

Step 7: Clean up the captured configuration file.

- Start **Notepad**. From the Windows Desktop, choose **Start > Run**. Type **Notepad**, and then press **Enter**.
- From the **Notepad** menu, choose **File > Open** and navigate to the file you captured. Click **Open**. Alternately, navigate to the saved .txt file and double click to open the file within **Notepad**.

- The captured text file has information not required for configuring a router, for example, the "More" prompts. Remove any unnecessary information from the captured configuration. Be careful not to delete any part of the commands.

To add comments to explain various parts of the configuration, use the exclamation mark (!). The router ignores any lines that start with an exclamation mark.

- At the end of each configured interface, add the **no shutdown** command.

```
interface serial 0/0/0
description WAN link to R2
ip address 172.17.0.1 255.255.0.0
clock rate 64000
no shutdown
```

- In the line **enable secret 5 \$1\$8SfN\$BfKkGdAdqowyyoKm8WSmn/**, delete the number 5 and the encrypted string, and replace them with the password **class**.
- Edit the line **banner motd ^CUnauthorized Use Prohibited^C** by replacing the ^C characters with number signs (#).
- Delete the lines that contain:

```
Show running-config
Building configuration
Current configuration
- More -
Lines that appear after the word "End"
```

- An example of an unedited captured running configuration from an 1841 router is shown below. This router has a 4-port integrated Fast Ethernet switch. The lines that need to be kept are highlighted.

Note: The Cisco IOS software inserts a number of commands by default. In most cases, you can remove these commands because the software automatically reinserts them. Generally, the commands you want to keep are the ones that you configured.

```
Building configuration...
Current configuration : 1073 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname R1
!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$8SfN$BfKkGdAdqowyyoKm8WSmn/
```

```
!  
no aaa new-model  
ip cef  
!  
no ip domain lookup  
!  
interface FastEthernet0/0  
  description R1 LAN Default Gateway  
  ip address 172.16.0.1 255.255.0.0  
  duplex auto  
  speed auto  
!  
interface FastEthernet0/1  
  no ip address  
  shutdown  
  duplex auto  
  speed auto  
!  
interface FastEthernet0/1/0  
!  
interface FastEthernet0/1/1  
!  
interface FastEthernet0/1/2  
!  
interface FastEthernet0/1/3  
!  
interface Serial0/0/0  
  description WAN link to R2  
  ip address 172.17.0.1 255.255.0.0  
  no fair-queue  
!  
interface Serial0/0/1  
  no ip address  
  shutdown  
!  
interface Vlan1  
  no ip address  
!  
!  
ip http server  
no ip http secure-server  
!  
control-plane  
!  
banner motd ^CUnauthorized Use Prohibited^C  
!  
line con 0  
  password cisco  
  logging synchronous  
  login  
line aux 0  
line vty 0 4  
  password cisco  
  login  
!  
scheduler allocate 20000 1000  
end
```

- i. The edited version of the 1841 running configuration is shown below. It is only necessary to specify the interfaces that you want to configure, as long as the startup-config file is erased prior to loading this file. The other interfaces will be shutdown by default.

Note: If the startup-config is not erased prior to loading this file, these new commands are co-mingled with the existing configuration and may produce unpredictable results.

```
hostname R1
!
enable secret class
!
no ip domain lookup
!
interface FastEthernet0/0
description R1 LAN Default Gateway
ip address 172.16.0.1 255.255.0.0
no shutdown
!
interface Serial0/0/0
description WAN link to R2
ip address 172.17.0.1 255.255.0.0
clock rate 64000
no shutdown
!
banner motd #Unauthorized Use Prohibited#
!
line con 0
password cisco
logging synchronous
login
line aux 0
line vty 0 4
password cisco
login
!
end
```

- j. When finished editing the file in Notepad, be sure to save it.

Step 8: Erase the current startup configuration and restart the router.

Any form of backup that has not been tested could be a problem in a failure situation. This includes backup configurations. The backup configuration must be tested. The test should be scheduled during low network usage periods, because the router must be taken off line. All users that may be affected should be notified in advance to ensure that the downtime is not an inconvenience.

- a. Before testing the backup configuration, erase the startup configuration. From the HyperTerminal session, enter the **erase startup-config** command at the enable router prompt to delete the configuration file from NVRAM.
- b. When prompted whether to continue erasing the files, press **Enter** to continue.
- c. Confirm that the startup configuration has been deleted by issuing the **show startup-config** command at the router prompt. What does the router show after this command is entered?

- d. Issue the **reload** command at the privileged EXEC mode prompt to reboot the router. If prompted that the configuration has been modified, type **N** and press **Enter**.
- e. When asked to proceed with the reload, press **Enter** to confirm. The router restarts.

- f. When prompted to enter the initial configuration dialog, type **N** and press **Enter**.
- g. When prompted to terminate autoinstall, type **Y** and press **Enter**. Press **Enter** again to go to the router prompt. What is the router prompt now? _____

Step 9: Reconfigure the R1 router from the saved text file.

- a. Change to privileged EXEC mode. Why was a password not required?

- b. Enter global config mode using the **configure terminal** command.
- c. From the HyperTerminal menu, choose **Transfer > Send Text File**.
- d. Navigate to the location where you saved the file previously, and select the file.
- e. Each line in the text file is used to configure the router as it is read from the text file.
- f. Observe the file as it loads and note any errors. The errors may be the result of typing errors.
- g. What is the most obvious indication that the router configuration has been restored?

- h. Type the **end** command, and press **Enter** or **Ctrl-Z** to exit global configuration mode.
- i. Issue the **copy running-config startup-config** command to save the newly created router configuration NVRAM.
- j. Verify that the running configuration is correct by using the **show running-config** command.

Step 10: Modify the R1 text file and use it to configure the R2 router.

- a. Before configuring the R2 router, erase the startup configuration, as was done with router R1 in Step 8, and issue the **reload** command to reboot the router.
- b. Using Windows Explorer or another method, copy the R1-XYZ.txt file and name it R2-XYZ.txt, where XYZ are your initials.
- c. Edit the new R2 text file and modify the necessary parameters to match those in the device configuration table for router R2.
 - Change the router host name.
 - Remove the **clock rate** command from the serial 0/0/0 interface address and description, because this is the DTE side of the connection to R1.
 - Change the Fast Ethernet 0/0 interface address and description.
 - Add the **no shutdown** command to the Fast Ethernet 0/0 and serial 0/0/0 interfaces.
- d. Save the modified R2 text file in Notepad.
- e. Enter configuration mode by typing **enable** and then **configure terminal**. Make sure that the router prompt displays **Router(config)#**.
- f. From the HyperTerminal menu, choose **Transfer > Send Text File**.
- g. Navigate to the location where you saved the R2 text file and select the file.
- h. Observe the file as it loads and note any errors. The errors may be the result of typing errors. If R2 is a different model router, errors can also result from Cisco IOS version variations and interface designation inconsistencies (for example, entering S0/0/0 when the router interface should be S0/0).
- i. What is the most obvious indication that the router configuration has been restored?

- j. Type the **end** command and press **Enter** or **Ctrl-Z** to exit global configuration mode.

- k. Issue the **copy running-config startup-config** command to save the newly created router configuration NVRAM.
- l. Verify that the running configuration is correct by using the **show running-config** command.

Step 11: Verify that the network is functioning.

- a. From host H1, ping the R1 Fast Ethernet 0/0 interface IP address at 172.16.0.1. Are the pings successful? _____
- b. From host H2, ping the R2 Fast Ethernet 0/0 interface IP address at 172.18.0.1. Are the pings successful? _____
- c. From R1, ping the R2 serial 0/0/0 interface IP address at 172.17.0.2. Are the pings successful? _____
- d. If any of the pings are not successful, troubleshoot the host and router configs until they are.

Note: You cannot ping from host H1 to H2, because routing has not been configured.

Router Interface Summary Table

Router Interface Summary				
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
800 (806)	Ethernet 0 (E0)	Ethernet 1 (E1)		
1600	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
1700	Fast Ethernet 0 (FA0)	Fast Ethernet 1 (FA1)	Serial 0 (S0)	Serial 1 (S1)
1800	Fast Ethernet 0/0 (FA0/0)	Fast Ethernet 0/1 (FA0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2500	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
2600	Fast Ethernet 0/0 (FA0/0)	Fast Ethernet 0/1 (FA0/1)	Serial 0/0 (S0/0)	Serial 0/1 (S0/1)
Note: To find out exactly how the router is configured, look at the interfaces. The interface identifies the type of router and how many interfaces the router has. There is no way to effectively list all combinations of configurations for each router class. What is provided are the identifiers for the possible combinations of interfaces in the device. This interface chart does not include any other type of interface, even though a specific router may contain one. An example of this might be an ISDN BRI interface. The information in parenthesis is the legal abbreviation that can be used in Cisco IOS commands to represent the interface.				