Lab - Use Tera Term to Manage Router Configuration Files

Topology

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0/1	192.168.1.1	255.255.255.0	N/A
S1	VLAN 1	192.168.1.11	255.255.255.0	192.168.1.1
PC-A	NIC	192.168.1.3	255.255.255.0	192.168.1.1

Objectives

Part 1: Configure Basic Device Settings

Part 2: Use Terminal Emulation Software to Create a Backup Configuration File

Part 3: Use a Backup Configuration File to Restore a Router and Switch Configuration

Background / Scenario

It is a recommended best practice to maintain backup configuration files for routers and switches in the event that they need to be restored to a previous configuration. Terminal emulation software can be used to easily back up or restore a router or switch configuration file.

In this lab, you will:

- Use Tera Term to back up a router running-configuration file.
- Erase the router startup configuration file.
- Reload the router.
- Restore the missing router configuration from the backup configuration file.

Note: The routers used with CCNA hands-on labs are Cisco 4221 with Cisco IOS XE Release 16.9.4 (universalk9 image). The switches used in the labs are Cisco Catalyst 2960s with Cisco IOS Release 15.2(2) (lanbasek9 image). Other routers, switches, and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and the output produced might vary from what is shown in the labs. Refer to the Router Interface Summary Table at the end of the lab for the correct interface identifiers.

Note: Ensure that the routers and switches have been erased and have no startup configurations. If you are unsure contact your instructor.

Required Resources

- 1 Router (Cisco 4221 with Cisco IOS XE Release 16.9.4 universal image or comparable)

- 1 Switch (Cisco 2960 with Cisco IOS Release 15.2(2) lanbasek9 image or comparable)
- 1 PC (Windows with a terminal emulation program, such as Tera Term)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology Ethernet cables as shown in the topology

Part 1: Configure Basic Device Settings

In Part 1, you will set up the network topology and configure basic settings, such as the interface IP addresses, device access, and passwords on the router.

Step 1: Cable the network as shown in the topology.

Attach the devices as shown in the topology and cable as necessary.

Step 2: Configure the PC-A network settings according to the Addressing Table.

Step 3: Configure basic settings for the router.

a. Assign a device name to the router.

b. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.

c. Assign **class** as the privileged EXEC encrypted password.

d. Assign **cisco** as the console password and enable login.

e. Assign **cisco** as the VTY password and enable login.

f. Encrypt the plaintext passwords.

g. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.

h. Configure interfaces as listed in the table above.

i. Save the running configuration to the startup configuration file.

Step 4: Configure basic settings for the switch.

a. Assign a device name to the switch.

b. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.

c. Assign **class** as the privileged EXEC encrypted password.

d. Assign **cisco** as the console password and enable login.

e. Assign **cisco** as the VTY password and enable login.

f. Encrypt the plaintext passwords.

g. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.

h. Shut down all unused interfaces

i. Configure interface VLAN 1 as specified in the table above.

j. Save the running configuration to the startup configuration file.

Part 2: Create a Backup Configuration File

In Tera Term or other terminal emulation program, you can create a log of your commands and output to a device via a connection. In this part, you will record your interaction with a device using the logging feature of Tera Term.

Note: If Tera Term is not installed, you can download the latest version from a number of internet sites. Simply search for a Tera Term download.

Step 1: Create a log file.

a. Connect to the router via Serial connection in Tera Term as necessary. In the New Connection window, select the **Serial** radio button and the appropriate communications port for your PC (i.e., COM1).

b. From the **File** menu, choose **Log…**, and save the **teraterm.log** file to the Desktop. Ensure that the **Append** and **Plain text** check boxes are enabled (checked).

c. The Tera Term log file will create a record of every command issued and every output displayed.

   Note: You can use this feature to capture the output from several commands in sequence and use it for network documentation purposes. For example, you could issue the **show version**, **show ip interface brief**, and **show running-config** commands to capture information about the router.

Step 2: Display the router running-configuration.

a. Use the console password to log in to the router.

b. Enter privileged EXEC mode.

c. From privileged EXEC mode enter the **show running-config** command.

d. Continue pressing the space bar when **--More--** is displayed until you see the router R1# prompt return.

e. From the **File** menu, choose **Show Log Dialog**. Click **Close** to end the log session.

Note: You can also copy and paste the text from the Tera Term window directly into a text editor.

Part 3: Use a Backup Configuration File to Restore a Router and Switch Configuration

Step 1: Erase the router startup-configuration and reload it.

a. From privileged EXEC mode erase the startup configuration.

```
R1# erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
```

b. Reload the router.

```
R1# reload
Proceed with reload? [confirm]
```

c. At the System Configuration Dialog prompt, type **no**; a router prompt displays, indicating an unconfigured router.

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


Would you like to enter the initial configuration dialog? [yes/no]:


Press RETURN to get started!
```

```
<output omitted>
Router>
```

d. Enter privileged EXEC mode and enter a **show running-config** command to verify that all of the previous configurations were erased.

Step 2: Edit the saved configuration backup file to prepare it for restoring the router configuration.

To restore the router configuration from a saved running configuration backup file, you must edit the text.

a. Open the **teraterm.log** text file.

b. Remove each instance of **--More--** in the text file.

Note: The **--More--** was generated by pressing the Spacebar when displaying the running configuration.

c. Delete the initial lines of the backup configuration file, so that the first line starts with the first configuration command as shown below.

```
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
```

d. In the lines for interface GigabitEthernet0/0/1, insert a new line to enable the interface.

```
interface GigabitEthernet0/0/1
 ip address 192.168.1.1 255.255.255.0
 duplex auto
 speed auto
```

Change to:

```
interface GigabitEthernet0/0/1
 ip address 192.168.1.1 255.255.255.0
 duplex auto
 speed auto
 no shutdown
```

e. After you have made all of the edits to the backup configuration file, save your changes to filename **R1-config-backup**.

Note: When saving the file, an extension such as **.txt**, may be added to the filename automatically.

Step 3: Restore the router configuration.

You can restore the edited running configuration directly to the console terminal in router global configuration mode, and the configurations are entered as if they were commands entered individually at the command prompt.

a. From the Tera Term console connection to the router, enter global configuration mode.

b. From the **File** menu, select **Send file…**.

c. Locate **R1-config-backup** and select **Open**.

d. Save the running configuration to the startup configuration file.

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

e. Verify the new running configuration.

Step 4: Backup and restore the switch.

Go back to the beginning of Part 2 and follow the same steps to backup and restore the switch configuration.

Reflection Question

Why do you think it is important to use a text editor instead of a word processor to copy and save your command configurations?

Router Interface Summary Table

Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
1800	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
1900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2801	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
2811	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
4221	Gigabit Ethernet 0/0/0 (G0/0/0)	Gigabit Ethernet 0/0/1 (G0/0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
4300	Gigabit Ethernet 0/0/0 (G0/0/0)	Gigabit Ethernet 0/0/1 (G0/0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)

Note: To find out how the router is configured, look at the interfaces to identify the type of router and how many interfaces the router has. There is no way to effectively list all the combinations of configurations for each router class. This table includes identifiers for the possible combinations of Ethernet and Serial interfaces in the device. The table 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 string in parenthesis is the legal abbreviation that can be used in Cisco IOS commands to represent the interface.