ICT1010 Computer Networks
2021-2022 Trimester 2

Laboratory 4a:
Getting to know Cisco Integrated Services Routers (ISR)

LEARNING OUTCOMES

Upon completion of this laboratory exercise, you should be able to:

- Part 1: Establish console session with a Cisco router
- Part 2: Configure basic router settings
- Appendix A: Initialize and reload a Cisco router

REQUIRED HARDWARE

- 1 x Rack of Cisco network devices
- 1 x Box of Cables containing
  - o USB-to-DB9/DB9-to-RJ45 console cables
  - o Ethernet cables
- 2 x Laptops

REQUIRED SOFTWARE

- Tera Term 4.105 https://ttssh2.osdn.jp/
- Driver for USB-Serial (USB-to-DB9/DB9-to-RJ45) console cable if needed

PART 1: ESTABLISHING CONSOLE SESSION WITH A CISCO ROUTER

1.1 As discussed in the lectures, a router or layer-3 device is required to inter-connect different VLANs/subnets together to allow communication between different VLANs/subnets and the Internet.

1.2 However unlike a switch, a router cannot function without configuration upon powering up.

1.3 Hence in this lab, you are going to learn to establish a console session to a Cisco router to configure it; specifically the Cisco 2900 and 4300 series Integrated Services Router (ISR) as shown:

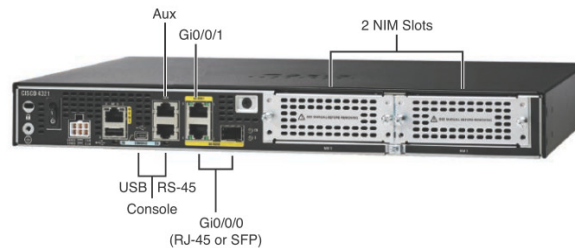Cisco ISR2901   Cisco ISR2911

Cisco ISR4321

1.4 In contrast to a switch, a router has only a few interfaces/ports to inter-connect different VLANs/subnets together; e.g. as shown on the back panel of the 2900 and 4300 series routers:
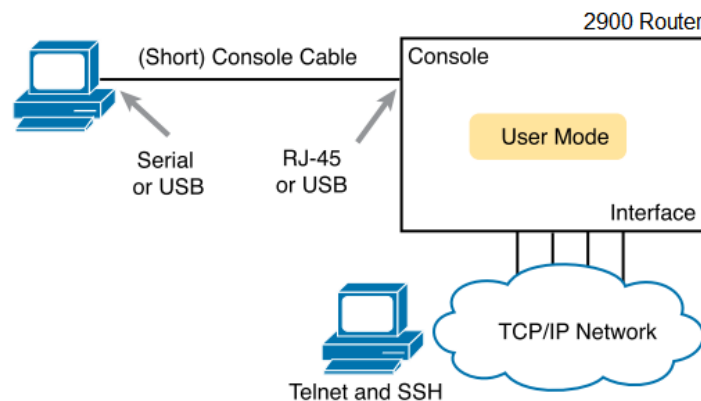

Cisco ISR2901

Cisco ISR2911

Cisco ISR4321

1.5 Similar as a Cisco switch, the operation of a Cisco router is based on the same Internetwork Operating System (IOS) which can be configured using command-line interface (CLI) via three methods – the console, Telnet, and Secure Shell (SSH).


1.6 Now, connect the lab PC or your laptop to the console port of the ISR2901, ISR2911 or ISR4321 router using the USB-to-DB9/DB9-to-RJ45 cable.

1.7 Once connected, start a terminal emulation program such as Tera Term in your PC/laptop. Click 'Serial' and select the COM port (number may vary) corresponding to ATEN USB to Serial Bridge, example as shown, to establish a console session as shown:
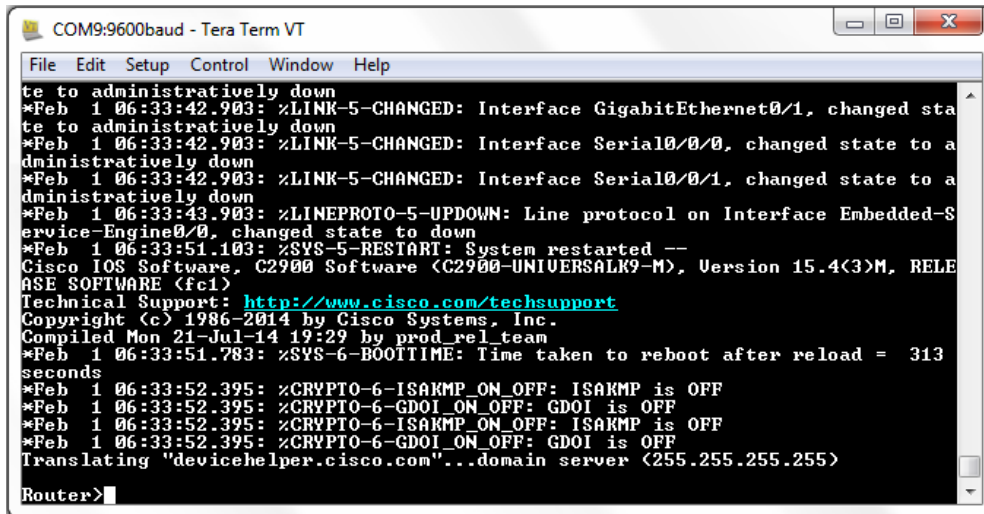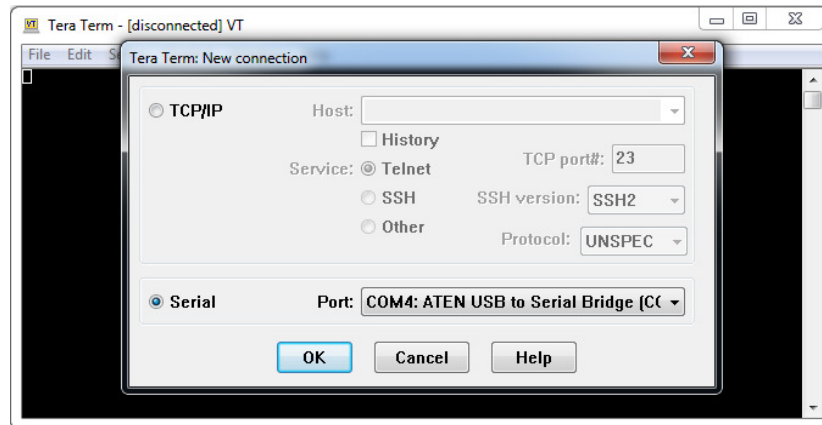

1.8 Next, click the 'OK' button, and press the 'Enter' key. If you can see the terminal output below, you have established a console session with the router successfully.
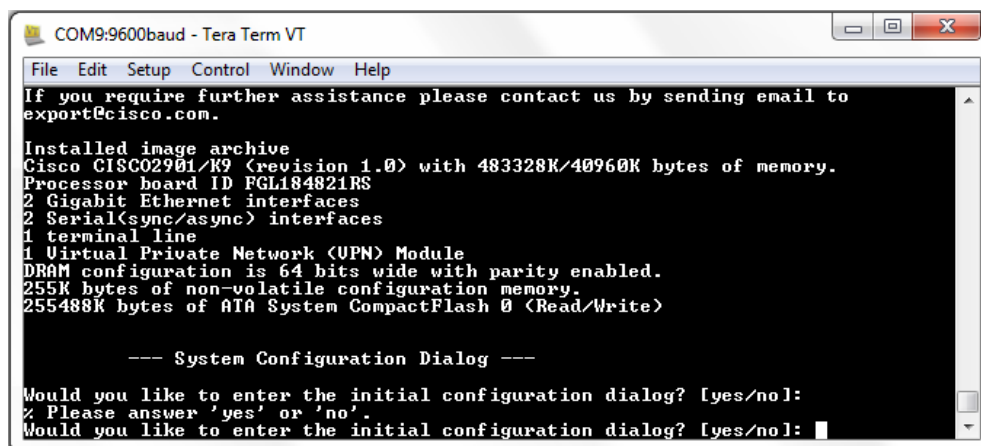
1.9 Similarly, answer 'no' to avoid entering into the long and tedious interactive configuration dialog.

1.10 Next, you will be prompted to terminate the autoinstall program. Just press enter to choose the default answer 'yes' to terminate.

1.11 After that, you'll notice a series of log messages being displayed, and then you will see the familiar command prompt in the default user mode as shown:
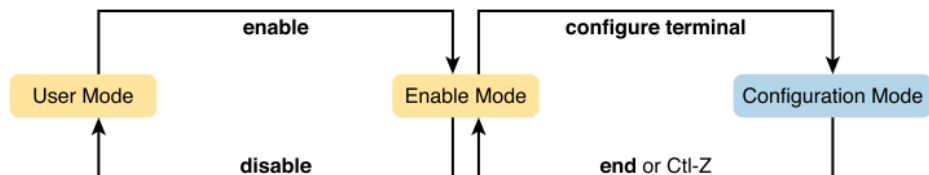

(If you can't see the Router> prompt after some time, just press the Enter key.)

PART 2: CONFIGURING BASIC ROUTER SETTINGS

2.1 Similar as a switch, to configure a router, you need to navigate from the default user mode to enable mode and then to the configuration mode:

2.2 For a start, at the user mode, show the version of the IOS:

```
Router> show version
```

2.3 Next, navigate to enable mode to show the running configuration:

```
Router> enable
Router# show running-config
```

2.4 From the enable mode, navigate to configuration mode to assign a device hostname R1 to the router:

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

2.5 To prevent the router from attempting to translate incorrectly entered commands as though they were hostnames, you may wish to disable DNS lookup as follows:

```
R1(config)# no ip domain-lookup
```

2.6 Similarly there are too many commands to learn all of them. Instead, you should know how to use the command help '?':

What You Enter	What Help You Get
?	Help for all commands available in this mode.
help	Text describing how to get help. No actual command help is given.
Command ?	Text help describing all the first parameter options for the command.
command parm?	This style of help lists all parameters beginning with the **parameter typed so far.** (Notice that there is no space between *parm* and the **?**.)
command parm<Tab>	If you press the Tab key midword, the CLI either spells the rest of this parameter at the command line or does nothing. If the CLI does nothing, it means that this string of characters represents more than one possible next parameter, so the CLI does not know which one to spell out.
command parm1 ?	If a space is inserted before the question mark, the CLI lists all the next parameters and gives a brief explanation of each.

Appendix A Initialize and Reload a Router

Step 1: Connect to the router.

Console into the router and enter privileged EXEC mode using the **enable** command.

```
Router> enable
Router#
```

Step 2: Erase the startup configuration file from NVRAM.

Type the **erase startup-config** command to remove the startup configuration from nonvolatile randomaccess memory (NVRAM).

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

Step 3: Reload the router.

Issue the **reload** command to remove an old configuration from memory. When prompted to Proceed with reload, press Enter to confirm the reload. Pressing any other key will abort the reload.

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

*Nov 29 18:28:09.923: %SYS-5-RELOAD: Reload requested by console.
Reload Reason: Reload Command.
```

Note: You may receive a prompt to save the running configuration prior to reloading the router. Respond by typing **no** and press Enter.

```
System configuration has been modified. Save? [yes/no]: no
```

Step 4: Bypass the initial configuration dialog.

After the router reloads, you are prompted to enter the initial configuration dialog. Enter **no** and press Enter.

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

Step 5: Terminate the autoinstall program.

You will be prompted to terminate the autoinstall program. Respond **yes** and then press Enter.

```
Would you like to terminate autoinstall? [yes]: yes

Router>
```