

Network Lab

Note: For log in or other network problems, please notify Bob Siglito promptly by either e-mail robert.sigillito@jhu.edu or call him at (301) 294-7072

Login Procedures

1). There are altogether 7 Cisco routers and 3 Catalyst switches in the network lab.

To login to the system consoles of the routers/Cisco switches, you must have either Internet access, or dial-in facility.

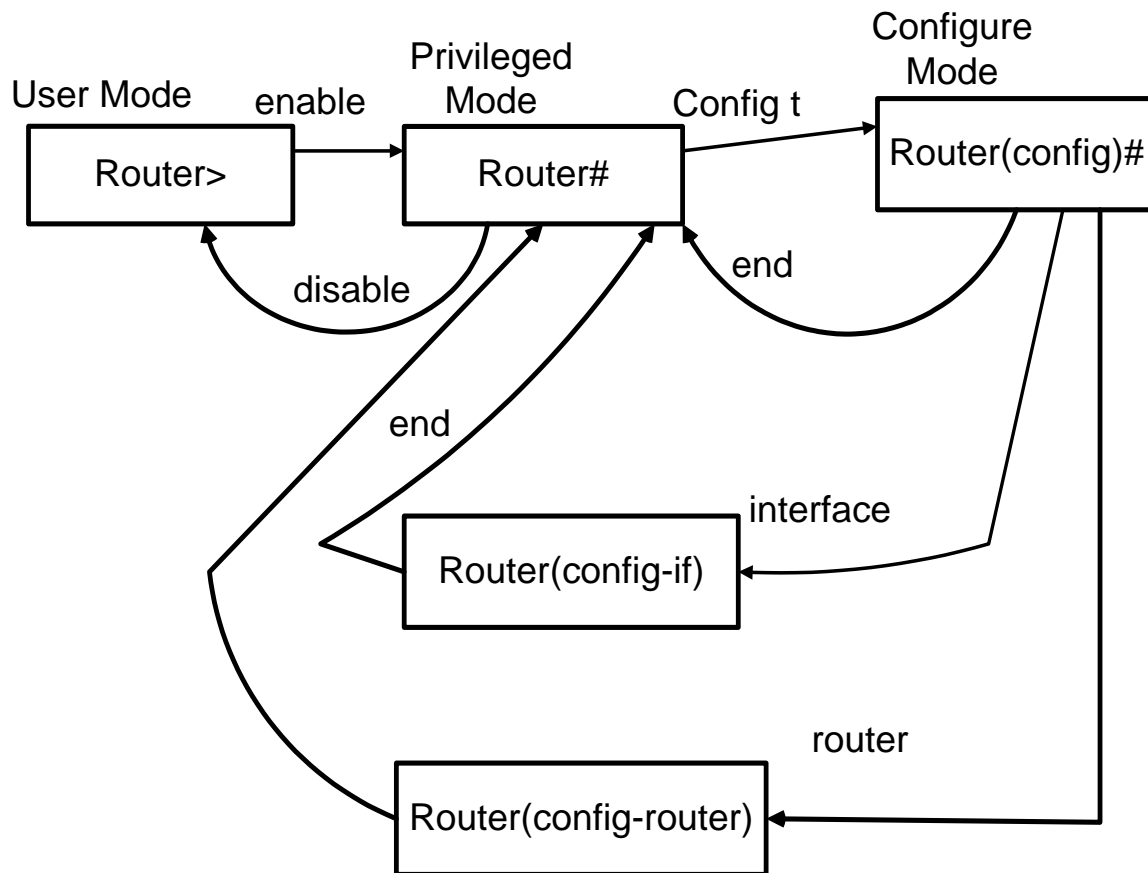
- **To login-in to the system console of the Cisco routers/switches, you must use the terminal server at JHU MCC.**
- **For detailed discussion of the terminal server, please see the terminal server in the class Web page.**

2). After connecting with the console port of the router/switch, hit carriage return and waiting for the router to prompt you for the password.

- **The password is: ***** to be supplied in the first class**

3). When '>' prompt appears, enter the command 'enable'

- then supply the password: ***** ;
- Password will be supplied in class at the beginning of class
- When the password is entered, the router will enter the 'privileged' mode.



4).Router will issue the following prompt:

router-name#

Router name is any one of the following:

**Rockville, Washington , Baltimore, San-Jose ,
Los_Angelos, New-York or San_Francisco**

- **When ‘router-name#’ sign appears, you are in the privileged mode.**

Once in the privileged mode, you can enter many of the router commands. To find out the list of commands you can enter, enter

Router-name# ?

- **Router in response to the command ‘?’ , will display a list of all the commands that you can use.**

The following are a few examples:

- **configuration commands**
 - **config t**
- **display commands:**
 - **sh ip route - to display the routing table**
 - **clear ip route * - to clear the routing table**
 - **sh ip arp - to display the contents of ARP Cache**
 - **sh ip traffic**
 - **sh host**
- **Other commands that can be entered are:**
 - **debug arp - turn on arp debug mode**
 - **debug ip rip - turn on rip debug mode**
 - **no debug all - to turn off all debug modes**

Note:

For Cisco router configuration and command references, please also referred to the following references:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios112>

http://www.cisco.com/univercd/cc/td/doc/product/software/ios112/112cg_cr/1cbook/index.htm

◆ **Privileged Mode - Only in Privileged User Exec Mode, you can enter router configuration commands**

- **The router prompt for the ‘Privileged Mode’ is ‘#’**

◆ **Example:**

- **Rockville # config t /*Rockville is the router name*/**
 - **/*config t is the command which the user entered; config t means the configuration command is to be entered from the terminal */**
- **The configuration commands that can be entered includes:**
 - **hostname e.g. hostname Rockville**
 - **interface e0**
 - **interface s0**
 - **To define default-route, proceed as:
ip route 0.0.0.0 0.0.0.0 x.y.z.w**

- **interface commands**

Example of interface commands:

- **interface ethernet0**
- **ip addr 192.168.0.251 255.255.255.0**
- **interface serial0**
 - ip addr 192.168.1.1 255.255.255.0**
 - encapsulation ppp**
 - bandwidth 64**
 - no peer neighbor-route**
 - no fair-queue**
 - clockrate 64000**
 - dce-terminal-timing-enable**
 - no cdp enable**

- **To end the configuration mode, enter ‘ctrl-z’ or end and return to the privileged mode**
- **After finishing the ‘configuration mode’, the user must make a permanent copy of the configuration file by entering ‘wr memory’ or ‘copy running-config startup-config’**
 - **This command will write a copy of running-config into NVRAM.**

◆ **The Cisco routers have four types of storage areas:**

- **RAM or memory (i.e., Dynamic Random Access Memory) – contains the current running-config**
 - **Anything stored in RAM will be lost when power is lost; to prevent the lost of your configuration always save the contents of RAM into NVRAM by issuing ‘wr mem’ Or ‘copy running-config startup-config’**
- **Flash Memory - contains Cisco IOS images**
- **ROM (Read Only Memory)**
- **NVRAM (Non-volatile Random Access Memory)**
 - **As soon as it is configured, the configuration is stored as running-config which is stored in the RAM. If power is lost, everything stored in the memory (RAM) will be lost**
 - **If power is lost and restored, router will use the information which is contained in the startup-config to configure the router**
 - **In CS771 and IST711, you will only interface with RAM memory and NVRAM.**
- **‘wr memory’ will save a copy of the running-config in NVRAM**
 - **wr memory = copy running-config startup-config**
- **Remember that as soon as you enter a command in the configuration mode, it becomes effective right away**

- **Example:**

```
Baltimore (config) #config t  
Baltimore (config) #interface serial0  
Baltimore (config) #shutdown /*the interface  
will be shutdown right away */  
/*(config) is to tell the user that it is in the  
configuration mode */  
Baltimore (config) #no shutdown  
/*this command will activate the interface */  
Baltimore(config) #ctrl-z /*return to privileged  
mode */
```

- ◆ **Other Router Commands in the privileged User Mode**

- **Show Config /*to show the current configuration*/**
- **Sh ip route /* to display the ip routing table*/**
- **Sh arp /*to show ARP table */**
- **Sh int ethernet0 /* to show the interface status of Ethernet 0*/**
- **Sh int serialx, where x=0 or 1**
- **Sh ip traffics**
- **Ping x.y.z.w**
- **Trace x.y.z.w /* to trace the route to the destination**
x.y.z.w */

Network Lab.

The following explains how to do the network lab project.

- ◆ **Step 1. First login to the terminal server
keymaker.mcc.jhu.edu**
 - see the section on Terminal Server
 - **Configure the router by assigning proper IP address to all the interfaces**
 - **Enable router rip version 2 and specify on which network interfaces the router should broadcast or multicast RIP messages.**
 - **Save the configuration to NVRAM**

- ◆ **Step 2. Repeat step1 for all the other six routers i.e., Washington, Baltimore and San-Jose, Los_Angeles, San_Francisco and New-York**
- ◆ **Step 3. At this point the IP addresses of all the seven routers should be properly assigned. Start with Rockville, issue the following**
 - 1). **First issue the command : Clear ip route ***
 - **The purpose of this command is to clear the contents of the routing table**
 - 2). **Then issue the command : Sh ip route**
 - **This command will display the contents of the routing table**
 - **proceed to produce hardcopy report of the routing table**

3).Sh config

- **Produce hardcopy report of your Cisco router configuration**
- **Repeat the same things for other six routers**

Cisco Router Review Questions

1).Explain the difference between the following:

Memory

NVRAM

2). Explain the difference between running-config and startup-config.

What is the purpose of the following commands:

wr memory

or copy running-config startup-config

3).What is the purpose of the statements:

router rip

network 198.76.1.0

network 198.76.2.0

network 198.76.3.0

network 198.76.4.0

network 198.76.5.0

no network 198.76.11.0

4).Explain how you can first INACTIVATE an interface and later on ACTIVATE the interface again.

5).Explain how you can turn on or off the debug mode for ARP or 'IP RIP'.