An-Najah National University

Networks-Lab
Dr. Muhannad Al-Jabi
Thursday 8:00am – 2:00pm
Summer Semester

Experiment Information	
Experiment Name: Routers Basic Setup and Configuration	Experiment Number: #3
Performed: 23 of June, 2021	Submitted: 30 of June, 2021
Partner Students	
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Introduction:

A router is essentially a dedicated microcomputer with a processor, operating system, RAM, Flash, and ROM. Disk drives, keyboards, and monitors are not available on routers.

A router is part of the OSI layer model's Network layer. Path determination and packet switching are their two fundamental duties, which are carried out through routed and routing protocols.

Objectives:

- Learn how to connect router with PC and Login to a router by HyperTerminal.
- Learn how to configure a router.
- Learn how to identify routers in multiple modes.
- Editing and using the router Command Line Interface (CLI).
- Learn how to configure a router for the first time. (using the setup mode).
- Learn how to configure a router using a command per line.

Procedure:

Connecting a Router with PC for Configuration

It is required to utilize a terminal emulator program such as Hyperterminal when connecting a router to a PC for setup purposes so that the PC can interface with the router's console port. It is important to configure the parameters as follows:

- ✓ 9600 baud.
- ✓ 8 data bits.
- ✓ 1 stop bit.
- ✓ No parity.
- ✓ No flow control.

It's also required to have a physical connection to the router. A particular form of cable known as a Rollover cable is used to do this.

Connect a rollover cable to the router console port (RJ-45 connector). Then connect the other end of the rollover cable to the RJ 45 to DB-9 adapter Attach the female DB-9 adapter to a PC.

You can configure a router after connecting to it successfully. A Router has several modes, including User mode, Privileged mode, and Global configuration.

Router Modes

You'll need to know each of the many user modes a router has and what each one is for when utilizing router operating systems like Cisco IOS.

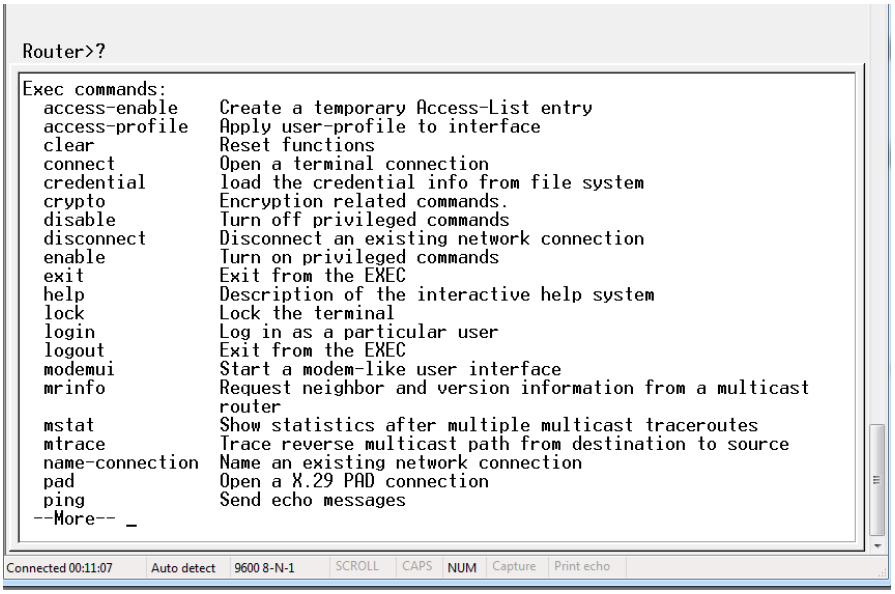
- **User Mode:**

Login to the router: After we connected to the router and logged in. The router displays the following prompt: Router> And this means that we are in the user mode.

```
Router>
```

- What prompt did the router display?
- It displays **Router>**
- What does the prompt symbol mean?
- It indicates that we are in user mode.

Enter the help command: Enter the help command: At the router prompt, type ? to show all available commands in user-mode.



- List eight available commands from the router response list.
- You will find the required list in the previous image.
- Was "enable" one of the commands available?
- Yes, see the ninth command in the previous image.

Then we entered the command show version “shver”

```
Router>sh ver
Cisco IOS Software, C2600 Software (C2600-ADVIPSERVICESK9-M), Version 12.4(15)T1

2, RELEASE SOFTWARE (fc3)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Fri 22-Jan-10 00:53 by prod_rel_team

ROM: System Bootstrap, Version 12.2(8r) [cmong 8r], RELEASE SOFTWARE (fc1)

System image file is "flash:c2600-advipservicesk9-mz.124-15.T12.bin"


This product contains cryptographic features and is subject to United

States and local country laws governing import, export, transfer and
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

Cisco 2611XM (MPC860P) processor (revision 2.0) with 127115K/3957K bytes of memo
ry.
Processor board ID JAE0747007R
M860 processor: part number 5, mask 2
2 FastEthernet interfaces
4 Low-speed serial(sync/async) interfaces
1 Virtual Private Network (VPN) Module
32K bytes of NVRAM.
49152K bytes of processor board System flash (Read/Write)

Configuration register is 0x2142

Router>
```

- What is the number of Cisco routers?
- 2611XM (MPC860P)

What is the version of ios software?

- 12.4(15)T12
- What is the system image file name?
- Flash:c2600-advipservicesk9-mz.124-15.T12.bin
- How much of Flash memory?
- 49152KB
- How much of NVRAM?
- 32KB

- **Privileged Exec Mode:**

Enter enable mode: We used the (enable) command to enter from user mode to privilege mode.

```
Router#
```

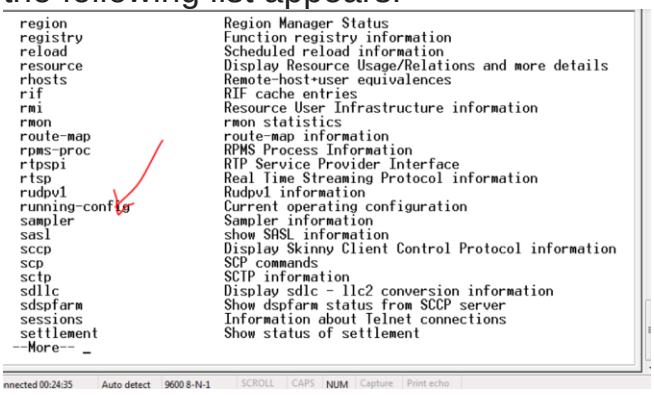
- What changed in the router prompt display and what does it mean?
- ✓ It changed to Router#, which means we've entered privilege mode.

Enter the help command: At the router prompt, we typed (?) to enter into the help command.

```
Router>enable
Router#?
Exec commands:
  access-enable    Create a temporary Access-List entry
  access-profile   Apply user-profile to interface
  access-template  Create a temporary Access-List entry
  archive          manage archive files
  audio-prompt     load ivr prompt
  auto             Exec level Automation
  beep             Blocks Extensible Exchange Proto
  bfe              For manual emergency modes setting
  call             Voice call
  ccm-manager      Call Manager Application exec commands
  cd               Change current directory
  clear            Reset functions
  clock            Manage the system clock
  cns              CNS agents
  configure        Enter configuration mode
  connect          Open a terminal connection
  copy             Copy from one file to another
  credential       load the credential info from file system
  crypto           Encryption related commands.
  ct-isdn          Run an ISDN component test command
  debug            Debugging functions (see also 'undebug')
  delete           Delete a file
  dir              List files on a filesystem
  disable          Turn off privileged commands
  disconnect       Disconnect an existing network connection
  dot1x            IEEE 802.1X Exec Commands
  enable           Turn on privileged commands
  eou              EAPoUDP
  ephone-hunt      ephone hunt exec command
  erase            Erase a filesystem
  event            Event related commands
  exit             Exit from the EXEC
  help             Description of the interactive help system
  hms              Host Mapper Service
  isdn             Run an ISDN EXEC command on an ISDN interface
  lock             Lock the terminal
  login            Log in as a particular user
  logout           Exit from the EXEC
  microcode        microcode commands
  modemui          Start a modem-like user interface
  monitor          Monitoring different system events
  more             Display the contents of a file
  mpoa             MPOA exec commands
  mrinfo           Request neighbor and version information from a multicast
                   router
```

- List ten available commands from the router response list.
- You will find the required list in the previous image.
- When the word "more" appears, what happened when you hit the Enter?
- ✓ A new single command will appear.
- When the word "more" appears, what happened when you hit the space?
- ✓ A list of commands will appear.

List all show commands: After we entered "show" followed by a space then "?", the following list appears.



- Is "running-config" one of the available commands?
- Yes, see the command number 14 in the previous image.

Look at the running router configuration: After we entered show running-config at the router prompt, the following list appears.

```
Current configuration : 915 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Router
!
boot-start-marker
boot-end-marker
!
!
no aaa new-model
no network-clock-participate slot 1
no network-clock-participate wic 0
!
!
ip cef
!
!
!
 --More--
```

- ➢ List 6 key pieces of information you can get from this command.
- ✓ You will find the required list in the previous image.
- ➢ Is there any password or encrypted one?
- ✓ Yes, see the previous image.

Using the command history: We used [ctrl + p] or [up arrow] command, which allows you to look over your command history.

- ➢ What happened at the router prompt when you press up arrow?
- ✓ We can look over our command history.
- ➢ Press (?) to see command list, what is the config command?
- ✓ Yes, a config command is available; it is used to enter configuration mode.
- ➢ Press (config ?) is there a terminal command?
- ✓ Yes, it is available.

Global Configuration Mode:

Enter global config mode: Using the command configterminal, we entered global mode.

1. Press (?) then list 10 commands.

```
Router(config)#?
Configure commands:
  aaa                         Authentication, Authorization and Accounting.
  aal2-profile                Configure AAL2 profile
  access-list                 Add an access list entry
  alarm-interface             Configure a specific Alarm Interface Card
  alias                       Create command alias
  appfw                       Configure the Application Firewall policy
  application                 Define application
  archive                     Archive the configuration
  arp                         Set a static ARP entry
  async-bootp                 Modify system bootp parameters
  atm                         Enable ATM SLM Statistics
  backhaul-session-manager    Configure Backhaul Session Manager
  banner                      Define a login banner
  bba-group                   Configure BBA Group
  beep                        Configure BEEP (Blocks Extensible Exchange
                              Protocol)
  boot                        Modify system boot parameters
  bridge                      Bridge Group.
  buffers                     Adjust system buffer pool parameters
  busy-message                Display message when connection to host fails
  call                        Configure Call parameters
 --More--
```

2. Press (router ?) then list 2 commands and describe them?

```
Router(config)#router ?
  bgp        Border Gateway Protocol (BGP)
  eigrp      Enhanced Interior Gateway Routing Protocol (EIGRP)
  isis       ISO IS-IS
  iso-igrp   IGRP for OSI networks
  mobile     Mobile routes
  odr        On Demand stub Routes
  ospf       Open Shortest Path First (OSPF)
  rip        Routing Information Protocol (RIP)
```

- bgp: Border Gateway Protocol.
- rip: Routing Information Protocol.

3. Press (router rip), describe the prompt?

```
Router(config)#router rip
Router(config-router)#
```

- The prompt changed to Router(config-router) When we typed (router rip).

4. Press (exit) what happened?
   - The prompt changed to Router(config) When we typed (exit).

5. Press (int then tab) what happened?
   We got the interface, note that tab cause autocomplete.

6. Press (interface ?) then list 4 commands and describe them?

```
CDMA-Ix             CDMA Ix interface
CTunnel             CTunnel interface
Dialer              Dialer interface
FastEthernet        FastEthernet IEEE 802.3
Group-Async         Async Group interface
Lex                 Lex interface
Loopback            Loopback interface
MFR                 Multilink Frame Relay bundle interface
Multilink           Multilink-group interface
Null                Null interface
Port-channel        Ethernet Channel of interfaces
Serial              Serial
Tunnel              Tunnel interface
Vif                 PGM Multicast Host interface
Virtual-PPP         Virtual PPP interface
Virtual-Template    Virtual Template interface
Virtual-TokenRing   Virtual TokenRing
range               interface range command
vmi                 Virtual Multipoint Interface
```

- FastEthernet: FastEthernet IEEE 802.3
- MFR: Multilink Frame Relay bundle interface.
- Multilink: Multilink-group interface.
- range: interface range command.

7. Press (interface FastEthernet 0/0) what happened? describe the prompt?

```
Router(config)#interface fastEthernet 0/0
Router(config-if)#
```

- ❖ The prompt changed to Router(config-if) When we typed (interface FastEthernet 0/0).

8. Press (exit) what happened?
   - ❖ The prompt changed to Router(config) When we typed (exit).

Exit the router:

- ✓ When we use (exit), we return to the previous mode.
- ✓ When we use (ctrl+c), we return to the user mode.
- ✓ When you use (logout), we logout from all modes.

Router Setup Mode

In this part, we followed the steps mentioned in the manual.

- ➢ Was setup command one of the commands available?
- ✓ Yes, it is available.
- ➢ What is the importance of the word in the square brackets?
- ✓ If there is only one word, it is the default command, and you can simply press enter to accept the default answer.
- ✓ When two words are separated by a forward slash, you must type the answer you desire among them.
- ➢ How does your router prompt change?
- ✓ network-lab

```
network-lab>enable
Password:
```

Conclusion:

- ✓ We discovered that the router has various modes and that selecting one of them with the appropriate commands causes the router's display to change.
- ✓ Using the router HELP command, we learned about various commands during the setting. We also used other commands to switch between modes.
- ✓ We learned how to use the router setup mode and what global and interface settings may be modified when in setup mode.