Cisco Router IOS Modes

- CLI (Command-Line Interface) is the primary user interface used for connecting Cisco devices. Although new devices support web interface for management, still you need to be fluent at command prompt. CLI allows you to directly execute IOS commands, whether using a router console or terminal or using remote access methods.

- Cisco IOS is the proprietary operating system for Cisco devices. IOS provides group of commands used for monitoring, configuring and maintaining cisco devices. For security and easy administration, IOS commands are divided in the set of different command modes. Each command mode has its own set of commands. Which commands are available to use, depend upon the mode you are in.

Following are the Cisco IOS Modes available are available on Router:

1. User Execution mode

2. Privilege Execution mode

3. Global Configuration mode

4. Interface Configuration mode

5. Sub Interface Configuration mode

6. Line Configuration mode

7. Dynamic Routing Configuration mode

8. DHCP Configuration mode

9. ROMMON mode

Representation of Cisco IOS modes

Mode	Representation
User Execution mode	***Router>***
Privilege Execution mode	***Router#***
Global Configuration mode	***Router(config)#***
Interface Configuration mode	***Router(config-if)#***
Sub Interface Configuration mode	***Router(config-subif)#***
Line Configuration mode	***Router(config-line)#***
Dynamic Routing Configuration mode	***Router(config-router)#***
DHCP Configuration mode	***Router(dhcp-config)#***
ROMMON mode	***rommon 1 >***

Cisco IOS Modes Description

User EXEC Mode	- This is the primary(default) mode when you logged in router. On job environment, it is usually password protected. You need a valid username and password to access this mode. You have three chances to enter a valid password, before connection attempt is refused. On LAB environment, you could access this mode directly (unless you have configured it for password). - On this mode, we can access only limited information and configuration of router due to security reasons. User mode does not allow to make any changes or configuration of router. - User exec mode is the subset of privileged exec mode. For security purposes, this mode is reserved for tasks that do not change the configuration of router. It has limited commands those allow you to connect to remote devices, change terminal line settings on a temporary basis, perform basic tests and list system information.

	- By default, it consists device hostname followed by a greater than sign. For router default **hostname** is "**Router**". ***Router>***
Privilege EXEC Mode	- Privileged exec mode is the main exec mode. Same as user exec mode on job environment, this mode is also password protected. You have to enter the password to access this mode. In lab environment, it's usually unprotected. You can access this mode by executing "enable" command at user exec mode. ***Router>enable*** ***Router#*** - Most commands of this mode are one time commands, like show or clear commands, which show current configuration status and clear counters on interfaces respectively. - On this mode, we can access entire information and configuration of router. - This mode has all commands available for exec mode including user exec mode. - Like User mode, privilege mode also does not allow to make any changes or configuration of router.
Global Configuration Mode	- Global configuration mode is the next access level in IOS mode sequence. This mode is used to configure device globally, or to enter in element like interface, protocols specific configuration mode. Use "configure terminal" command at privileged exec mode to access global configuration mode. ***Router>enable*** ***Router#configure terminal***

	Router(config)# - Global configuration mode and element specific configuration mode allow you to make change in running configuration. By default running configuration is not stored across the reboot, but you can save running configuration to preserve it across the reboot. To save running configuration use "**copy running-config startup-config**" from privileged EXEC mode commands. - We can make many changes in router configuration on Global configuration mode. - To return in privileged exec mode from global configuration mode or element specific configuration mode we have three commands. ***Ctrl + Z (Press CTRL key with Z Key)*** ***exit*** ***end***
Interface Configuration Mode	- Interface configuration mode is used to configure interface related settings. Many settings are enabled on a per-interface basis like as serial port, Ethernet. Interface configuration commands affect interface related settings, such as enable or disable interface, bandwidth, clock rate etc. To configure or change these setting, you need to enter in interface specific mode. To access interface configuration mode use following command. ***Router> enable*** ***Router# configure terminal*** ***Router(config)#interface <type number>*** ***Router(config-if)#***
Sub Interface Configuration Mode	- If interface supports virtualization, then sub interface mode is used to configure the virtual interface. From sub interface configuration mode you can configure multiple virtual interfaces known as sub interface on a single physical interface. On router usually virtual interfaces are used for wan connection such as Frame Relay. Frame

	Relay connection supports multiple point-to-point links known as PVC (Permanent virtual circuits). PVC can be combined under the separate sub interfaces those are configured on a single physical interface. Another example of sub interface is VLAN communication, where we create sub interface on physical FastEthernet port for each VLAN. ***Router(config)#interface fastEthernet 0/0.1*** ***Router(config-subif)#***
Line Configuration Mode	Line configuration mode is used to configure few password settings (line console password) and it is also used to configure remote access services(like telnet, secure shell). To access line configuration mode use following command: ***Router> enable*** ***Router# configure terminal*** ***Router(config)#line console 0*** ***Router(config-line)#***
Dynamic Routing Configuration Mode	Dynamic configuration mode is used to configure dynamic routing & make changes in existing dynamic routing configuration. To access dynamic routing configuration mode use the following commands: ***Router> enable*** ***Router# configure terminal*** ***Router(config)#router <routing protocol>*** ***Router(config-router)#***
DHCP Configuration Mode	DHCP configuration mode is used to configure DHCP on router and make changes in existing DHCP configuration. To access DHCP configuration mode use the following commands: ***Router> enable*** ***Router# configure terminal*** ***Router(config)# ip dhcp pool <pool name>*** ***Router(dhcp-config)#***

ROMMON Mode	During the boot process, router loads IOS image in RAM. If it does not find a valid IOS image, it would enter in ROMMON mode. You can manually enter in this mode by interrupting boot sequence during the startup. This mode is used for diagnostic purpose. By default router does not enter in this mode unless it completely fail to locate the IOS image. To manually enter in this mode, execute reload command from privileged exec mode and then press CTRL + C key combination during the first 60 seconds of startup. ***rommon 1 >***