Configure Cisco Router Step by Step Guide

Access CLI prompt of router

Cisco IOS supports various command modes, among those followings are the main command modes.

- User EXEC Mode
- Privileged EXEC Mode
- Global Configuration Mode
- Interface Configuration Mode
- Sub Interface Configuration Mode
- Setup Mode
- ROM Monitor Mode

You need to execute specific commands to navigate from one mode to another.

Mode	Prompt	Command to enter	Command to exit
User EXEC	Router >	Default mode after booting. Login with password, if configured.	Use **exit** command
Privileged EXEC	Router #	Use **enable** command from user exec mode	Use **exit** command
Global Configuration	Router(config)#	Use **configure terminal** command from privileged exec mode	Use **exit** command
Interface Configuration	Router(config-if)#	Use **interface type *number*** command from global configuration mode	Use **exit** command to return in global configuration mode
Sub-Interface Configuration	Router(config-subif)	Use **interface type *sub interface number*** command from global configuration mode or interface configure mode	Use **exit** to return previous mode. Use **end** command to return in privileged exec mode.
Setup	Parameter[Parameter value]:	Router will automatically insert in this mode if running configuration is not present	Press **CTRL+C** to abort. Type **yes** to save configuration, or **no** to exit without saving when asked in the end of setup.
ROMMON	ROMMON >	Enter **reload** command from privileged exec mode. Press **CTRL + C** key combination during the first 60 seconds of booting process	Use **exit** command.

- IOS commands are not case sensitive; you can enter them in uppercase, lowercase, or mixed case.
- Password is case sensitive. Make sure you type it in correct case.
- In any mode, you can obtain a list of commands available on that mode by entering a question mark (?).
- Standard order of accessing mode is
  User Exec mode => Privileged Exec mode => Global Configuration mode => Interface Configuration mode => Sub Interface Configuration mode
- Router will enter in setup mode only if it fails to load a valid running configuration.
- Router will enter in ROMMON mode only if it fails to load a valid IOS image file.
- You can manually enter in ROMMON mode for diagnostics purpose.

Enter in global configuration mode to execute following commands.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
```


Change default router name

By default **Router** name is configured on routers.

```
Router(config)#hostname LAB1
LAB1(config)#
```

Configure password on cisco router

Secure console port

Command	Description
Router(config)#line console 0	Move in console line mode
Router(config-line)#password console	Set console line password to CNN
Router(config-line)#login	Enable password authentication for console line

Secure auxiliary port

Auxiliary port provides remote access to router.

Command	Description
Router(config)#line aux 0	Move into auxiliary line mode
Router(config-line)#password AUXCNN	Set auxiliary line mode password to AUXCNN
Router(config-line)#login	Enable auxiliary line mode password

Enable telnet/SSH access on cisco router

VTY is the standard name for telnet and SSH connection. By default only first five VTYs connections are enabled. When you try to connect them remotely you will get following message

```
Password required but none set
```

Command	Description
Router(config)#line vty 0 4	Move into all five VTYs line
Router(config-line)#password TELCNN	Set password to TELCNN on all five lines
Router(config-line)#login	Configure VTYs to accept telnet connection

In above example we set password on all five lines collectively but you can do this separately if you need different passwords for different lines. Steps will be same.

Secure privilege exec mode with password

We have two commands to configure the password.

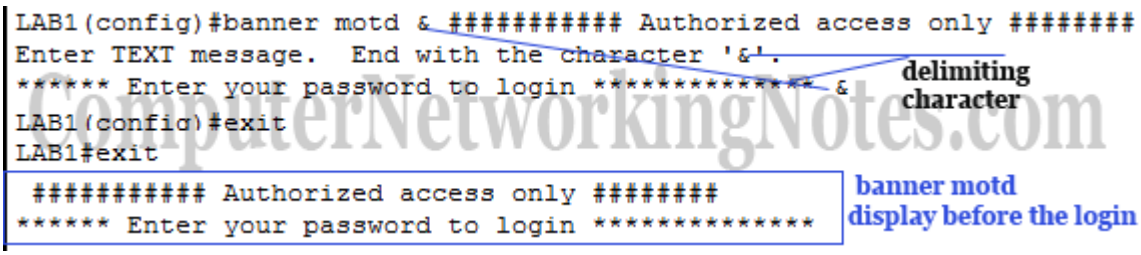
1. **Switch(config)# enable password *Privilege_EXEC_password***
2. **Switch(config)# enable secret *Privilege_EXEC_password***

enable password command will store password in plain text while **enable secret** command will store password in encryption format.

Login banner

We can configure two types of banner on routers; MOTD banner and Exec banner.

banner exec command is not available in packet tracer. You can practice with ***banner motd*** command. Both commands work in same manner. Only the difference between these commands is the place of display. MOTD banner will display before the login. An EXEC banner will display after the authentication process and before the exec mode.



Both commands use delimiting character to specify the starting and ending of message. It means command parser will terminate the message on delimiting character instead of the Enter key. This feature allows us to span the message in multiple lines.

Configure clock time zone

Router allows us to localize the time zone. Following command will set time zone to +5 hour of EST [Eastern Standard Time].

```
Router(config)#clock timezone EST 05
```

Assign hostname to IP Address

Hostname are easy to remember. We can use host name instead of their IP address while connecting with remote address. Router resolves IP address to hostname in two ways: static and dynamic.

In static method we have to assign hostname to IP address.

In dynamic method we have to configure an external DNS server and need to configure its IP address on router.

show hosts command will display the currently configured hosts with their IP addresses. Following figure illustrate an example of static entry for hostname.

```
LAB1(config)#ip host bhilwara 202.12.21.4
LAB1(config)#exit
LAB1#show hosts
Default Domain is not set

Host                      Port  Flags      Age Type   Address(es)
bhilwara                  None  (perm, OK)  0   IP      202.12.21.4
LAB1#
LAB1#ping bhilwara
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 202.12.21.4, timeout is 2 seconds:
```


Disable automatic domain lookup

By default routers are configured to resolve every word that is not a command. It will first look in static DNS table for an entry. If it fails to find an entry in static DNS table, it will try with DNS server at address 255.255.255.255. If you are not going to use DNS server or hostname facility, it is better to turn this off. It will save your time because every incorrectly typed command will cost you a wait of minute or two.

no ip domain-lookup command is used to disable this feature.

```
LAB1#showw
Translating "showw"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

LAB1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
LAB1(config)#no ip domain-lookup
LAB1(config)#exit
LAB1#
%SYS-5-CONFIG_I: Configured from console by console

LAB1#showw
Translating "showw"
% Unknown command or computer name, or unable to find computer address

LAB1#
```

incorrect typed command

trying to resolve

turn off automatic name DNS lookup

incorrect typed command

No DNS lookup

Enable logging synchronous

Whenever IOS has any kind of notification, it will display that on command prompt. It fines until prompt is free. What if you are typing a command and notification line appears in the middle of the command? This is really annoying. Luckily we can stop this behavior. **logging synchronous** command will enable synchronization at command prompt.

```
LAB1(config)#line console 0
LAB1(config-line)#logging synchronous
LAB1(config-line)#exit
LAB1(config)#
```

After this if IOS has anything to display it will move prompt and your typed command in next line. Notification will not insert in the middle of command. If you continue typing, the command will execute properly, even though it looks wrong at prompt.

Disable auto logout from console line

Cisco IOS has a great security feature to secure the console line. It automatically logs out ideal connection in 10 minutes. You can disable this feature in lab environment. ***exec-timeout 0 0*** command will disable this.

```
LAB1(config)#line console 0
LAB1(config-line)#exec-timeout 0 0
LAB1(config-line)#exit
LAB1(config)#
```

Never use this command in real world. It could create security risk to your network.

Configure serial interface in router

Serial interface is used to connect wan network. Following command will configure serial 0/0/0 interface.

```
LAB1(config)#interface serial 0/0/0
LAB1(config-if)#description Connected to bhilwara
LAB1(config-if)#ip address 10.0.0.1 255.0.0.0
LAB1(config-if)#clock rate 64000
LAB1(config-if)#bandwidth 64
LAB1(config-if)#no shutdown
LAB1(config-if)#exit
LAB1(config)#
```


Command	Description
Router(config)#interface serial 0/0/0	Enter into serial interface 0/0/0 configuration mode
Router(config-if)#description Connected to bhilwara	Optional command. It set description on interface that is locally significant
Router(config-if)#ip address 10.0.0.1 255.0.0.0	Assigns address and subnet mask to interface
Router(config-if)#clock rate 64000	DCE side only command. Assigns a clock rate for the interface
Router(config-if)#bandwidth 64	DCE side only command. Set bandwidth for the interface.
Router(config-if)#no shutdown	Turns interface on

Serial cable is used to connect serial interfaces. One end of serial cable is DCE while other end is DTE. You only need to provide clock rate and bandwidth in DCE side.

Configure FastEthernet Interface in router

Usually FastEthernet connects local network with router. Following commands will configure FastEhternet 0/0 interface.

Command	Description
Router(config)#interface fastethernet 0/0	Enter into the FastEthernet 0/0 interface.
Router(config-if)#description Development department	This command is optional. It will set description on interface.
Router(config-if)#ip address 192.168.0.1 255.255.255.0	Assigns address and subnet mask to interface
Router(config-if)#no shutdown	Turns interface on. All interfaces are set to off on startup.

Disable router interface

By default all interface are administratively down on startup. We should also follow this rule.

For security reason, we should always disable unused interface on router. shutdown command is used to disable the interface.

```
LAB1(config)#interface fastEthernet 0/0
LAB1(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
LAB1(config-if)#exit
LAB1(config)#
```


Saving running configuration in cisco router

Router keeps configuration in RAM. All settings that we have made in this article will erase once the router reboot. To preserve this configuration after reboot we must have to save this. Following command will save running configuration in NVRAM.

```
LAB1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
LAB1#
```


Erasing configuration in cisco router

We have done our practice now make it available for next round of practice. As we know that routers load configuration file from NVRAM in startup.

At the end of startup it takes configuration file from NVRAM and parse it RAM. We need to erase this configuration file from NVRAM to remove configuration. Following command will delete configuration file from NVRAM.

```
LAB1#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continu
firm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
LAB1#reload
Proceed with reload? [confirm]
System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)
Cisco 1841 (revision 5.0) with 114688K/16384K bytes of memory.

Self decompressing the image :
########################################################################

         --- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]:
```

Press Enter key to confirm the delete action

RAM still have running configuration to erase it we need to reload the router