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This tutorial explains how to configure a Cisco router step by step. Learn how to secure (Enable & Privilege Exec Mode), erase (Running Configuration), enable (Telnet access), set (Hostname, Login banner & Time zone), configure (FastEthernet & Serial interface) and several other essential tasks in detail with examples. To explain basic router configuration commands, I will use packet tracer network simulator software. You can use any network simulator software or can use a real Cisco router to follow this guide. There is no difference in output as long as your selected software contains the commands explained in this tutorial. Create a practice lab as shown in following figure or download this pre-created practice lab and load in packet tracer Download practice topology for basic router configuration This practice lab is only a recommendation to understand the basic router configuration commands more clearly, it's not a requirement to follow this tutorial. You can follow this tutorial in a single router or even without router. 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 Following table lists essential commands to navigate between different IOS modes. 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. Change default router name By default Router name is configured on routers. We can configure any desired name on router. hostname command will change the name of router. For example following command will assign LAB1 name to the router. Configure password on cisco router Router is a critical device of network. It supports multiple lines for connection. We need to secure each line [port]. 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. You can attach modem in this port. Not all devices support this port. If your router supports this port use following commands to secure it. 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 access on cisco router Depending on the model number and IOS software version router may supports various number of VTY connections range from 5 to 1000. VTY is the standard name for telnet and SSH connection. By default only first five VTYs connections are enabled. But you cannot connect them. When you try to connect them remotely you will get following message Password required but none set This message indicates that password is not set on VTY lines. Password is required to connect VTYs. Following commands set password to TELCNS on VTYs line. Command Description Router(config)#line vty 0 4 Move into all five VTYs line Router(config-line)#password TELCNS Set password to TELCNS 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. line vty [line number] command will move into that specific line. password [password] command will assign the desired password. login command will enable that line to accept the connection. Secure privilege exec mode with password Along with access lines we can also secure privilege exec mode with password. We have two commands to configure the password. Switch(config)# enable password Privilege EXEC password Switch(config)# enable secret Privilege EXEC password Both commands will set the password on privilege exec mode. Difference between these commands is the method of password storage. 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. 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. 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. 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. 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. Command Description Router(config)#interface serial 0/0/0 Enter into serial interface 0/0/0 configuration mode Router(config-if)#description Connected to bhlwara 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 FastEthernet 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. 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. 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. That's all for this tutorial.



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