

# Notes for Cisco Routing and Switching1 – Introduction to Networks

## Chapter 2. Configuring the Network Operating System

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1. Flash memory holds the IOS, and delivers a copy of the IOS into RAM when a device is powered on. Although flash can be upgraded and overwritten, it is nonvolatile memory. The contents of flash are retained when a device is cycled or power is lost.
2. The startup configuration file is stored in NVRAM not the IOS. Factors that are important when upgrading to a new IOS version are the quantity of available RAM and flash memory, type and model of device, and features required.
3. Telnet and SSH require active networking services to be configured on a Cisco device before they become functional. Cisco switches do not contain AUX ports.
4. To be truly private a technician would use a Console connection however if remote management is required SSH provides a secure method.
5. Context-sensitive help provides the user with a list of commands and the arguments associated with those commands within the current mode of a networking device. A syntax checker provides error checks on submitted commands and the TAB key can be used for command completion if a partial command is entered.
6. Some guidelines for hostnames are as follows:
  - Be sure they start with a letter.
  - Do not allow spaces.
  - Be sure they end with a letter or digit.
  - Use only letters, digits, and dashes.
  - Check that the hostnames contain fewer than 64 characters.
  - It is important to configure a hostname because various authentication processes use the device hostname. Hostnames are helpful for documentation, and they identify the device during remote access.
7. Even though a network administrator might use the **enable secret** command, other passwords such as the console password can be seen. The **service password-encryption** command protects showing all passwords when a command such as **show running-configuration** is used.
8. While at the privileged mode prompt such as Router#, type **exit**, press **Enter**, and the banner message appears. Power cycling a network device that has had the **banner motd** command issued will also display the banner message, but this is not a quick way to test the configuration.
9. Access to the VTY and console interfaces can be restricted using passwords. Out-of-band management of the router can be restricted in both user EXEC and privileged EXEC modes.
10. The technician does not want to make any mistakes trying to remove all the changes that were done to the running configuration file. The solution is to reboot the router without saving the running configuration. The **copy startup-config running-config** command does not overwrite the running configuration file with the configuration file stored in NVRAM, but rather it just has an additive effect.

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11. As soon as configuration commands are entered into a router, they modify the device immediately. Running configuration files can not be deleted nor are they saved automatically.
12. In a Layer 2 switch, there is a switch virtual interface (SVI) that provides a means for remotely managing the device.
13. A switch, as a Layer 2 device, does not need an IP address to transmit frames to attached devices. However, when a switch is accessed remotely through the network, it must have a Layer 3 address. The IP address must be applied to a virtual interface rather than to a physical interface. Routers, not switches, function as default gateways.
14. DHCP provides automatic IP address configuration to hosts on a network. Hosts will be dynamically assigned an address when they connect to the network, although not necessarily the same address each time they connect. If there are static and dynamic addresses used together on the network there could still be the possibility of address conflicts. DNS can be used in conjunction with DHCP to allow users to communicate using names rather than IP addresses.
15. On a Windows PC, the **ipconfig** command can be used to verify the current IP configuration. The **ping** command can be used to verify connectivity to other network devices. The **show interfaces** and **show ip interface brief** commands are both Cisco IOS commands that are used to see the status of router and switch interfaces.
16. The IP address is independent of a MAC address. IP addresses that are assigned to end devices should be unique. They can be dynamically assigned by a DHCP server (not a DNS server) or manually assigned by local network administrators. If an address is assigned manually, the network administrator must make sure that it is unique.
17. If the switch is going to be managed, it is necessary to configure a VLAN interface with an IP address and a default gateway IP address. The no shutdown command has to be issued in the VLAN interface to activate it. The default gateway address can be any unique host address on the local network.
18. The **ping destination** command can be used to test connectivity.
19. Console port: It displays startup, debugging, and error messages by default. It can be used to restore an out-of-box configuration on a switch or router.  
Virtual Interface:It uses Telnet or SSH protocols for access. It requires an active network connection.  
AUX port:It connects through dialup connections. It is not supported on Catalyst switch devices.
20. The shortcuts with their functions are as follows:
  - Tab - Completes the remainder of a partially typed command or keyword
  - Ctrl-R - Redisplays, on a new line, the command currently being typed
  - Ctrl-Z - Exits configuration mode and returns to the EXEC
  - Up Arrow - Allows user to scroll backward through former commands
  - Ctrl-C - cancels any command currently being entered and returns directly to privileged EXEC mode
  - Ctrl-Shift-6 - Allows the user to interrupt an IOS process such as ping or traceroute