CCNA Exploration Chapter 11 Configure and Test. Study questions. Answers

Answers in white font.

11.1

IOS is short for:

Internetworking Operating System.

What sort of devices use the IOS?

Most Cisco devices: switches, routers, wireless access points.

Where is the IOS stored, and what is the advantage of this type of storage?

The IOS is stored in flash memory. The flash memory keeps it contents when the router is powered off, but flash memory can be overwritten, so that the IOS can be upgraded.

On most devices the IOS is copied into RAM when the device is powered on, and run from RAM. Why is this?

It gives better performance.

What are the three methods of accessing the IOS command line interface?

Console port via a serial line
AUX port via a modem
Telnet or SSH via a network connection

When would you have to use the console port rather than Telnet?

For initial configuration, as Telnet needs an IP address and password to be already configured.
Disaster recovery procedures and troubleshooting where remote access is not possible.
Password recovery procedures. (Gaining access when the password is not known and setting a new password.)

What precautions should you take to limit access to a device via the console port?

Set a password. Keep the device in a locked room or cabinet.

Why is SSH preferred to Telnet for remote access to a router?

SSH encrypts all communications and provides stronger password authentication.

Why is SSH not used instead of Telnet all the time?

Older IOS versions may not provide a SSH server. Computer operating systems may not provide a SSH client, and you may need to install and configure one in order to use SSH.

Do you need networking services configured on the router in order to gain access through the AUX port?

No

Why is the console port preferred to the AUX port?

The console port displays router startup, debugging, and error messages by default

What is the purpose of a configuration file?

It contains the configuration commands that have been entered by an administrator in order to customise the device for its particular function.

Where is the running configuration held, and what is it for?

In RAM. It is used for running the device.

Where is the startup configuration held, and what is it for?

In non-volatile RAM (NVRAM). The contents of NVRAM are kept when the router is powered off. When the router is powered on, it normally copies the startup configuration into RAM where it becomes the running configuration.

If an administrator makes a configuration change, does this change affect the running configuration or the startup configuration, and will the change be kept when the router is switched off?

It affects the running configuration at once. The administrator can save the change by copying the running configuration into the startup configuration. A change that is not saved will be lost when the router is switched off.

What are the main IOS modes, and which do you enter first when you access the CLI?

User executive mode, entered first.
Privileged executive mode
Global configuration mode
Other specific configuration modes

How do you know which IOS mode you are working in?

The router prompt changes to show the mode.

What is the difference between user exec mode and privileged exec mode?

User exec mode allows a limited set of basic monitoring commands with no access to configuration commands. Privileged exec mode should be protected with a password. It gives the full range of monitoring commands and access to the configuration modes.

What is the prompt in user exec mode if the router's name is Athens?

Athens>

What command would you enter in order to go to privileged exec mode?

enable (can be shortened to en) followed by <Enter>.

What happens after you have given this command?

If the router has been configured then you will be asked for a password. If it has not yet been configured then you go straight to privileged exec mode.

What is the prompt in privileged exec mode if the router's name is Athens?

Athens#

What command would you enter in order to go to global configuration mode?

Configure terminal (can be shortened to config t) followed by <Enter>.

What is the prompt in global configuration mode if the router's name is Athens?

Athens(config)#

What command would you enter in order to leave global configuration mode and go back to privileged exec mode?

exit *(You could also use* ***end*** *or ctrl + z. These commands take you from any configuration mode straight back to privileged exec.)*

What command would you enter in order to leave privileged exec mode and go back to user exec mode?

disable *(Do not use exit, or your session will finish.)*

You are reading a set of lab instructions and a command is shown like this:
Athens(config-if)#**ip address** *ip-address mask*
Explain the use of bold and italic in the instruction.

Bold means that you type in exactly what is shown. Italic means that you substitute appropriate information. In this case you enter the appropriate IP address and subnet mask.

Here is an example of a command
ip route *prefix mask* {*address* | *interface*} [*distance*] [**tag** *tag*] [**permanent**]
What do the curly brackets and the | sign mean in {*address* | *interface*}?
What do the square brackets mean in [*distance*]?

Curly brackets mean that you must include this information. | *means that you have a choice. You can either enter an address or you can enter an interface name. You must have one or the other, but not both.*
Square brackets mean that the keyword or argument is optional. You can enter a distance, or you can leave it out.

You know that there is a show command that will show you the contents of the routing table, but you cannot remember which show command it is. What should you do?

*Make sure that you are at the right prompt. Type in **show**, leave a space then type a question mark. The router will list all the available show commands.*

You think that a command starts with **co** but you cannot remember how the word continues. What should you do?

*Make sure that you are at the right prompt. Type in **co?** with no space before the ?. The router will list all available commands starting with co.*

You want a list of all available commands at the current prompt. What should you do?

*Type in **?** and you will see a list of commands. (Probably quite long.)*

If you type in a command and it contains an error so that the IOS cannot recognise it, how can you tell where the error is?

The position of the error will be marked by ^.

You start typing in a command **show int** then you press the Tab key. What happens?

*As long as the partially completed word is unambiguous (can only be completed in one way) then the word will be completed for you and you will see **show interfaces**.*

The backspace key will delete the character to the left of the cursor, just as you would expect. How can you delete the character at the cursor position?

Ctrl + d. (Delete key does not work in a Hyperterminal session.)

You give the **show run** command and the first screen of information is displayed. At the bottom it says --------More----------. How can you show the next screenful?

Press the spacebar. (If you press Enter, it just shows the next line.)

You are in interface configuration mode and you want to return to privileged exec mode. Which key combination should you use?

Ctrl + z

Which command should you give if you want to see statistics about serial interface 0/0 (and no other interfaces).

Show interfaces serial 0/0 *(You can shorten to* ***show int s 0/0****.)*

Which command will save the configuration currently in use in RAM into longer term storage in NVRAM?

copy running-config startup-config
You can shorten this to ***copy run start***
Warning. A typing error in this command could delete the operating system. Watch out for any messages mentioning Flash and ***do not*** *press Enter if you see one. There is an old fashioned but safe command for saving the configuration.*
wr

11.2

Why should each router and switch have a unique hostname?

So that you can identify them in documentation, and so you know which router or switch you are configuring/monitoring, particularly when you access them via Telnet.

You want to give a router the name Abingdon1. You have reached the global configuration prompt. What command do you give?

hostname Abingdon1

You decide that you do not want the router to be called Abingdon1 after all, and you want it to go back temporarily to the default name of Router while you decide on a new name. You are at the global configuration prompt. What command do you give.

no hostname
*(****hostname Router*** *would also change the name to Router.)*

You are starting a console session with a switch or router and you are prompted to enter a password. What will display on the screen as you enter the password?

*The password characters will not display at all, not even as ******.*

Why is the password **cisco** used for routers and switches in Networking Academy classes, but not used on production networks?

In classes many students will be configuring and reconfiguring the routers, and security is not normally an issue. Students need to learn how to set passwords, but there would be a problem if other students were then unable to access the routers and switches. For convenience, all Networking Academy classes use the same, easily remembered password. On a production network, security is an important issue. Strong passwords should be used, and they should be different for different devices and modes of access.

Starting from the privileged exec prompt of a router called London, how would you configure the password **cisco** on the console and 5 vty lines?

*London#**config t** (you might have given the full version)*
*London(config)#**line con 0***
*London(config-line)#**password cisco***
*London(config-line)#**login***
*London(config-line)#**exit***
*London(config)#**line vty 0 4***
*London(config-line)#**password cisco***
*London(config-line)#**login***
*London(config-line)#**exit***

Starting from the privileged exec prompt of a router called London, how would you configure an encrypted password **class** and an unencrypted password **cisco** to restrict access to privileged exec mode?

*London#**config t***
*London(config)#**enable secret class***
*London(config)#**enable password cisco***

You have configured both these passwords. Someone is starting a new console session and wants to gain access to privileged exec mode. Which password should be used?

***class** because the encrypted enable secret is used in preference to the unencrypted enable password if both are configured.*

The console and vty passwords are shown in plain text when the configuration is displayed. How can this be prevented.

*Use the **service password-encryption** command to apply a weak encryption to passwords when the configuration is displayed.*

Why is it a bad idea to configure a login banner “Welcome to the London router”?

In a court case, this banner could be taken as an invitation to hackers to break into the system. Banners should make it clear that unauthorised access is forbidden, and they should not give away any information (such as the router’s name). The exact wording of banners will depend on company policy and local laws.

Any character can be used as a delimiter when creating a message of the day banner. An administrator enters the command
Paris(config)#**banner motd *c No unauthorised access c***
What will be displayed when someone tries to start a console session with the router?

No unauthorised a

You enter some configuration commands. When will they take effect?

At once. They become part of the running configuration in RAM as soon as you press Enter.

You decide that you do not want the new commands after all. You have not saved the configuration since you gave the commands. How can you return to the previous configuration?

*If the previous configuration was saved in NVRAM and you have **not** saved the configuration after entering the new commands, then you can give the **reload** command to shut down the router and start it again. If you are prompted to save the configuration then you say no. The running configuration will be lost, and the router will load the previously saved configuration when it starts again.*

You decide that you do not want the new commands after all, but unfortunately you **have** saved the configuration since you gave the commands. How can you return to the previous configuration?

You use the backup file that you created (we hope) on a TFTP server or as a text file on a flash pen, floppy disk etc. You erase the existing startup configuration, reload the router so that it has only the default configuration, then you copy your backup configuration into RAM.
*No backup file? Oh dear. Remove each unwanted command individually by issuing the command again with a **no** in front, and restore any configuration that has been replaced by the unwanted commands.*

What is the purpose of the command **copy running-config tftp** and what additional information would you expect to give?

It copies the running configuration from RAM to a TFTP server. You would have to give the IP address of the TFTP server and the file name to be used.

How can you remove the existing saved startup configuration from NVRAM, and why must you be careful when doing so?

At privileged exec prompt, enter:
erase NVRAM:startup-config
or ***erase startup-config***
or ***erase start***
If you make a mistake while entering an erase command, you could erase a vital file, such as the IOS.

If you do not wish to back up your configuration file to a TFTP server, what other method can you use?

Set Hyperterminal to capture text, show the running configuration then stop the capture. Open the captured text file and edit it.

Does a switch need an IP address? If so, how many and what is their purpose?

A switch can operate without an IP address. A switch is often given an IP address so that it can be managed remotely. It only has one IP address.

Does a router need an IP address? If so, how many and what is their purpose?

A router needs a different IP address on each active interface. The task of a router is to forward packets from one network to another, so each interface is on a different network and its IP address acts as the default gateway for that network.

Which two basic commands must be given in interface configuration mode when configuring an interface?

ip address *ip-address mask*
no shutdown

Which additional command is needed on a DCE serial interface?

Clock rate 64000 *(or other suitable speed)*

Which other command should you give when configuring an interface, though it is not necessary for the router to operate?

Description *…. This appears in the configuration and is very valuable documentation. Use it to give the purpose of the interface, where it connects to, circuit and contact information.*

How would you configure an IP address on a switch?

It goes on the virtual interface VLAN1 and the commands are practically the same as configuring an IP address on a router interface.

*SwA(config)#**interface VLAN1***
*SwA(config-if)#**ip address 172.16.255.1 255.255.0.0***
*SwA(config-if)#**no shutdown***
*SwA(config-if)#**exit***

What else does a switch need if devices from outside the network are likely to contact it?

A default gateway. (Address of local router.)

11.3

How do you make a host ping itself, and why would you do this?

C:\>ping 127.0.0.1
It checks that TCP/IP is installed and working, but without putting a signal on the cable.

Why would you ping a host's own IP address from that host?

It checks that the NIC hardware and software (driver) are working and that the IP address is bound to the NIC.

Which command would you give for a list showing IP addresses and whether interfaces and protocols are up or down?

show ip interface brief

An interface is not operating. You give a show command and see that the interface is administratively down. What should you do to correct the problem?

*Go the the interface configuration prompt and give the **no shutdown** command.*

What action should bring a switch interface up?

Connect a cable to it.

11.4

What is a network baseline?

A series of measurements of network performance carried out under different conditions over a period of time.

Why is it important to establish a network baseline?

It provides a base of knowledge that is valuable for troubleshooting and optimising the network. It helps predict future problems and helps in planning for change.

What command could you give at a PC command prompt in order to list IP addresses and corresponding MAC addresses?

Arp –a

What should you do just before giving this command in order to ensure that devices are included in the list?

Ping all the devices.

What command could you give at a switch prompt in order to list IP addresses and corresponding MAC addresses?

Show mac-address-table