SEMESTER 2 Chapter 2   
Static Networking

V 4.0

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| 2.1.1 | What are the primary responsibilities of the router? | Determining the best path to send packets  Forwarding packets toward their destination |
| 2.1.3 | What is the first serial connector described called at the router end? | DB-60 |
|  | What is the first serial connector described called at the router end? | Smart Serial |
|  | What are the five standards supported by serial connections? | EIA/TIA-232, EIA/TIA-449, V.35, X.21, and EIA/TIA-530 standards |
| 2.1.3.2 | When will static routes and dynamic routes be added to the routing table? | After the exit interfaces are configured |
|  | What command will show the status and gives a detailed description for all interfaces on the router? | Show interfaces |
|  | What does the administratively down out put mean? | That the interface is turned off |
|  | What does the line down output mean? | That no carrier signal is being received |
|  | What does the show ip interfaces brief command list? | a portion of the interface information in a condensed format |
|  | Why is show ip interfaces brief command better than show running config to see if the state of the interfaces? | to quickly verify that interfaces are up and up (administratively up and line protocol is up) |
| 2.2.2 | What is the default state of router interfaces? | Shut down |
|  | What are the commands and prompt to enable an interface? | R1(config)#interface fastethernet 0/0  R1(config-if)#ip address 172.16.3.1 255.255.255.0  R1(config-if)#no shutdown |
|  | Even after configuring an interface, what must be received by the interface to change the state to up? | Carrier signal |
|  | What command will stop the messages returned by IOS not to interfere with your typing? | logging synchronous |
| 2.2.2.2 | What does a C mean in the output of show ip route? | Directly connected network |
|  | What types of addresses are seen in the routing table? | Network addresses |
| 2.2.3 | What must be true for the network of each interface on a router? | The subnet must be different |
|  | What is the default gateway for a LAN? | The router interface |
| 2.2.3.2 | What does a device send if it does not have the ip address in its ARP table? | ARP request |
| 2.2.4 | What are the commands to configure a serial interface? | R1(config)#interface serial 0/0/0  R1(config-if)#ip address 172.16.2.1 255.255.255.0  R1(config-if)#no shutdown |
|  | Why may a serial interface still be down after it has been configured? | The other end of the connection may not be configured |
|  | After the other end of the connection is configured, why is the line protocol down? | The clock rate has not been set |
| 2.2.5 | What end of a serial connection is the service provider? | DCE |
|  | What end of the serial connection is the router by default? | DTE |
|  | What device is used to convert the data from the router (DTE device) into a form acceptable to the WAN service provider? | CSU/DSU |
|  | What do serial interfaces require to control the timing of communication? | Clock signal |
| 2.2.5.2 | What two things must be done to configure a serial interface as a DCE? | 1. Connect the DCE end of the cable to the serial interface.  2. Configure the clock signal on the serial interface using the clock rate command. |
|  | What are the two types of serial cables used in the lab? | A DTE/DCE crossover cable on which one end is DTE and the other end is DCE  A DTE cable connected to a DCE cable |
|  | What command will tell you which type of cable is connected to the interface? | Show controllers |
| 2.2.5.3 | What command will show the status of the interfaces? | Show interface  Show ip interface brief |
|  | What is the second test to see if the interface is operational? | Ping |
|  | What command will show if the router knows how to get to the network? | Show ip route |
|  | What command will show you all the commands that have been configured on the router? | Show running-config |
| 2.3.1 | What is the purpose of the routing table? | A routing table is a data structure used to store routing information acquired from different sources. The main purpose of a routing table is to provide the router with paths to different destination networks. |
|  | What does the debug command show? | Monitor router operations in real time |
|  | What debug command will show you as networks are connected? | Debug ip route |
|  | What command is used to turn off the debug command? | Undebug all |
|  | What two commands are used to remove a directly connected network? | shutdown and no ip address |
| 2.3.2 | What is the crucial step in configuring your network? | Verify that all interfaces are up and up |
|  | What two commands should you use before you continue with more complex configurations? | the show ip interface brief command and the show ip route command |
|  | What does a failed ping display? | ….. |
| 2.3.2.2 | Why does the first ping fail and the second ping succeed? | There is no match in the routing table for the first ping but there is for the second ping |
| 2.3.3 | What is the network monitoring and troubleshooting tool used in this section? | Cisco Discovery Protocol (CDP) |
|  | Which device will information be gathered about, be specific? | directly connected Cisco devices |
|  | What information is contained in the advertisements? | the types of devices that are connected, the router interfaces they are connected to, the interfaces used to make the connections, and the model numbers of the devices |
|  | At layer 3, what do routing protocols consider neighbors? | devices that share the same network address space |
|  | What layer does CDP operate at? | Layer 2 |
|  | Describe Cisco CDP neighbors? | Cisco devices that are directly connected physically and share the same data link |
| 2.3.3.2 | What are the commands to display CDP information? | **show cdp neighbors and show cdp neighbors detail** |
|  | What is the default setting for CDP? | On |
|  | What are the 5 types of information that CDP provides information about? | Device identifiers - For example, the configured host name of a switch  Address list - Up to one Network layer address for each protocol supported  Port identifier - The name of the local and remote port-in the form of an ASCII character string such as ethernet0  Capabilities list - For example, whether this device is a router or a switch  Platform - The hardware platform of the device; for example, a Cisco 7200 series router |
| 2.3.4 | What information is displayed after issuing the show cdp neighbors command? | Neighbor device ID  Local interface  Holdtime value, in seconds  Neighbor device capability code  Neighbor hardware platform  Neighbor remote port ID |
|  | What information will be provided even if you can not ping that interface? | IP address |
|  | What information can be gathered if you telnet to a neighboring device? | Show CDP information from that device and build a logical topology |
|  | Can CDP be a security risk? | Yes |
|  | What command can be used to shut off CDP on a router? (command and prompt) | Router(config)#no cdp run |
|  | What command can be used to shut off CDP on an interface? (command and prompt) | Router(config-if)#no cdp enable |
| 2.4.1 | What are the two ways a router can learn about remote networks? | Manually, from configured static routes  Automatically, from a dynamic routing protocol |
|  | What is a stub route? | A network that can only be accessed by a single route |
|  | When are static routes used? | Stub routes |
|  | Why would dynamic routing be a waste of resources for a stub route? | Because there is only one way out for sending non-local traffic |
| 2.4.1.2 | What is the complete syntax for entering a static route? | Router(config)#ip route prefix mask {ip-address | interface-type interface-number [ip-address]} [distance] [name] [permanent] [tag tag] |
|  | What is the simpler version of the command that we will use? | Router(config)#ip route network-address subnet-mask {ip-address | exit-interface } |
|  | Describe the first 2 parameters used. | network-address - Destination network address of the remote network to be added to the routing table  subnet-mask - Subnet mask of the remote network to be added to the routing table. The subnet mask can be modified to summarize a group of networks. |
|  | Describe the choice for the last parameter to use. | ip-address - Commonly referred to as the next-hop router's IP address  exit-interface - Outgoing interface that would be used in forwarding packets to the destination network |
| 2.4.2 | List the output and explain each element from entering the static route. | ip route - Static route command  172.16.1.0 - Network address of remote network  255.255.255.0 - Subnet mask of remote network  172.16.2.2 - Serial 0/0/0 interface IP address on R2, which is the "next-hop" to this network |
|  | List the output and explain each element from entering the show ip route command. | S - Routing table code for static route  172.16.1.0 - Network address for the route  /24 - Subnet mask for this route; this is displayed in the line above, known as the parent route, and discussed in Chapter 8  [1/0] - Administrative distance and metric for the static route (explained in a later chapter)  via 172.16.2.2 - IP address of the next-hop router, the IP address of R2's Serial 0/0/0 interface |
| 2.4.2.2 | What are the 2 commands to verify static routes? | Show ip route  Show running-config |
|  | What is recommended to do after entering and verifying the static routes? | Save the configuration to NVRAM  R1#copy running-config startup-config |
| 2.4.2.3 | What does principle 1 define about where a router looks to forward packets? | Its own routing table |
|  | What does principle 2 define about what other routers routing tables contain? | Just because the route is in your table does not mean it is in other routers routing table |
|  | What does principle 3 state about the return route of a packet? | Just because a packet can get to a destination does not mean it can get back |
| 2.4.4.1 | Before a router forwards a packet, what must be determined? | The exit interface |
|  | List the two steps that the router uses to forward a packet. | Match the ip address to the routing table  Determine the exit interface, based on the route in the routing table. |
|  | When the router has to perform multiple lookups in the routing table before forwarding a packet, what is the process called? | Recursive lookup |
|  | How can a static route be entered to stop the recursive lookup process? | Enter the exit interface vs. next hop ip address |
| 2.4.4.2 | What happens to the static route if the exit interface goes down? | The static route is removed |
| 2.5.1.2 | What is the command to remove the static route with the next hop ip address? | No ip route (ip address) (s/n mask) (next hop ip) |
|  | What is the command to enter a static route using an exit interface? | ip route (ip address) (s/n mask) (exit interface) |
| 2.5.2 | What are the reasons to modify a static route? | The destination network no longer exists, and therefore the static route should be deleted.  There is a change in the topology, and either the intermediate address or the exit interface has to be changed. |
|  | Can a static route be directly modified? Explain your answer | No it must be removed and a new one configured |
|  | What is the most efficient way to enter a static route? | Use the exit interface |
| 2.5.3 | What are the three commands listed to verify static route configuration? | Show running-config, show ip route, ping |
| 2.5.4 | What is the destination MAC address if the packet is to be forwarded to the next hop router? | The next hop router MAC address |
|  | If the ip address does exist in the ARP table what type of request is issued? | ARP request |
| 2.5.4.2 | What is the difference between entering an exit interface for a static route on a serial interface and an Ethernet interface? | The serial is point to point  The Ethernet may have many different devices sharing the same multi-access network |
|  | Will a static route with an exit interface on a Ethernet interface always work? | No |
|  | What is the command to configure both the exit interface and ip address for a static route? | R1(config)#ip route 192.168.2.0 255.255.255.0 fastethernet 0/1 172.16.2.2 |
| 2.6.1 | Why does making a routing table smaller improve the efficiency of the router? | There are fewer routes to examine |
|  | What are the 2 rules on when a static route can be summarized? | The destination networks can be summarized into a single network address, and  The multiple static routes all use the same exit-interface or next-hop IP address |
|  | What are the six steps in creating a summary route? | 1. Write out the networks that you want to summarize in binary.  2. To find the subnet mask for summarization, start with the left-most bit.  3. Work your way to the right, finding all the bits that match consecutively.  4. When you find a column of bits that do not match, stop. You are at the summary boundary.  5. Now, count the number of left-most matching bits, which in our example is 22. This number becomes your subnet mask for the summarized route, /22 or 255.255.252.0  6. To find the network address for summarization, copy the matching 22 bits and add all 0 bits to the end to make 32 bits. |
| 2.6.2 | If two routes in the routing table match the packet, which route will the router choose? | The match that is most specific |
|  | What is a default static route? | A route that will match all packets |
|  | What are the 2 times a default static route is used? | When no other routes in the routing table match the packet's destination IP address. In other words, when a more specific match does not exist. A common use is when connecting a company's edge router to the ISP network.  When a router has only one other router to which it is connected. This condition is known as a stub router. |
|  | List the complete command to enter a default static route. | Router(config)#ip route 0.0.0.0 0.0.0.0 [exit-interface | ip-address ] |
|  | What is the ip address and subnet mask for quad-zero? | 0.0.0.0 0.0.0.0 |
| 2.6.2.2 | What does the \* mean next to the S in the routing table? | Candidate default |
|  | What is true about a default static route and matching packets? | It will match all packets |
| 2.7.1 | Definitely understand each step in the process explained. If any of the steps are confusing, list your questions here |  |
| 2.7.2 | What are some forces that can cause a networks status to change? | An interface fails.  A service provider drops a connection.  There is an over-saturation of links.  An administrator enters a wrong configuration. |
|  | What are some of the commands you can used to troubleshoot a network? | Ping, traceroute, show ip route, show ip interface brief, show cdp neighbors detail |