Video - IPv4 Router Routing Table (6 min)

Let's use Packet Tracer to learn about routing tables. We've learned about two types of routing tables-- a host routing table on a PC versus a router's routing table. Let's take a look at both. If I click on PC1 and I click on the Desktop tab and the Command Prompt, I can put in the command "netstat -r" to look at my routing table.

Now, this PC host routing table is a very simplified version of a routing table, and in reality, if it was a real PC, there would be many more entries. We can see that under Active Routes, there is one active route, and this is the default route. Our default gateway is located at 192.168.10.1, so there's one route, the default route. We can also see that there are different columns of information: the network destination, the netmask, the gateway, the interface, and the metric. We can see that we have a 0.0.0.0, or all-networks, destination using a 0.0.0.0, or all-networks, netmask and the gateway address of 192.168.10.1. This is the local router. The exit interface, which we will use to get to this gateway, will be our own 192.168.10.3 interface. The network distance for all networks to the gateway is a metric of 1. If this was a real PC, we would also see many more entries, like the 192.168.10 network. We would see a limited broadcast entry of 255.255.255.255. We would see a directed broadcast entry for 192.168.10.255, multicast address entries, including possibly IPv6.

Now let's take a look at the router's routing table. To look at the router's routing table, I'll click on router R1, click on the CLI tab to get to the command line interface. I'll press Enter to get to the command line. I'll type "enable" to get to privileged exec mode. And then the command to see the routing table is "show ip route." I'll press the space bar to get the rest of the output.

Now, the routing table tells us all of our network routes. If we scroll to the top, you can see that there are codes, letter codes, that allow us to know what the beginning of every line entry means. If we scroll down to the bottom, we can look at the routing entries. The router's routing table is similar to a host PC's routing table, except there are no columns to separate the information. The routing table has information about connected routes, remote network routes, and default routes. All three can be seen here in this routing table.

For instance, if we look at these two entries here, these are remote network routes. If we look at these entries here, these are for connected network routes. The last entry in the routing table is a default route, or gateway of last resort. Notice the quad-zero all-networks address with all-zeros netmask. If we look at the codes at the top, we can see that the D stands for EIGRP, making this our two remote networks. We can see that the letter C stands for "connected," showing us that these entries starting with C are our connected network routes. The capital L stands for the "link-local address"-- notice 192.168.10.1-- as opposed to the connected network 192.168.10.0. This is the local interface address, connected to GigabitEthernet0/0. If we want to understand the information based on the destination networks, then we can see that the destination networks are the first part of the entry here. This is the 10.1.1.0 destination network, the 10.1.2.0 destination network, the 192.168.10.0 destination network, and so on and so forth. The metric information is contained within the brackets. This is the administrative distance, and this is the metric. The gateway, or what we would call next top address, is located here. The time since we've last learned about this route is located here. And the exit interface is located here. These are just some of the basics of a router IPv4 routing table.