Video - Explaining the IPv4 Routing Table (5 min)

Let's take a more in-depth look at the router's routing table. But before we do that, let's discuss a few items. First of all, the routing table that we're looking at is the R1 router's routing table. The router has three connected networks: a connected network coming off of its interface here, a connected network coming off of its interface here, and a connected network that goes from here on this serial interface over to router R2.

If I was to highlight the three connected networks, they would look like this. Here's one connected network. Here's another connected network. And here's the third connected network. So these three interfaces each have a network coming off of them, and these are the three connected networks on router R1: the 192.168.10.0 network, the 192.168.11.0 network, and the 209.165.200.224 network between R1 and R2. R1 also knows about two remote networks. The two remote networks, R1 learned about from router R2. The two remote networks are the 10.1.1.0 network and the 10.1.2.0 network. For R1, the next top router is R2, located at 209.165.200.226. Let's look at the R1 routing table closer now that we know about these connected networks and these remote networks. I'll put in the command "show ip route" to examine the routing table.

Looking at the routing table, we can examine the first two routing entries here. We can see that both of these entries are for the remote networks 10.1.1.0 and 10.1.2.0. These are the networks here that are not connected to router R1. R1 learned about these remote networks from router R2 using the EIGRP dynamic routing protocol. We can see that here by the D at the beginning, which stands for EIGRP or the dual algorithm that's used by EIGRP.

Now, if we examine these two routing entries, we see the destination network, the subnet mask, and then this number is the administrative distance, or the trustworthiness, of the route, and this is the metric, or rating, of the route. Then we can see that to reach the 10.1.1.0 network, we need to go through the next hop router via IP address 209.165.200.226. This is that next hop address. In other words, if we want to get to this network up here, we need to go through router R2, whose IP address is 209.165.200.226. We can also see the timestamp that tells us how much time has expired since we last learned about this route. The last piece of information is the exit interface. So to reach the 10.1.1.0 network, we need to go to the next hop router at 209.165.200.226, and we need to exit our own Serial0/0/0 interface. That's this interface here on router R1.

Notice that if we examine a connected network routing entry-- in this case, the 192.168.10.0 network-- there is no next hop router IP address, because it's a directly connected route exiting out of the GigabitEthernet0/0 interface. Notice that the 192.168.11.0 network, which is also a connected route, exists the GigabitEthernet0/1 interface. Your routing table tells you all of the currently available networks that you can reach. It's very important to be able to read and understand your routing table.