Demystifying Networking
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Lecture – 41
Static Routing in a Router in CPT

Welcome to this video on Static Routing.

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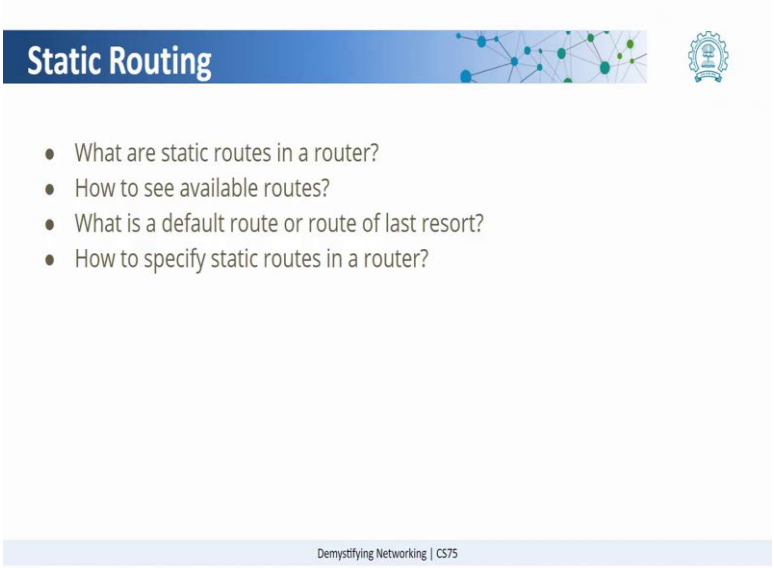

This is a packet tracer video in which we will be trying to answer these questions. What are static routes? How to see available routes in a router? What is a default route and how to specify static routes in a router?

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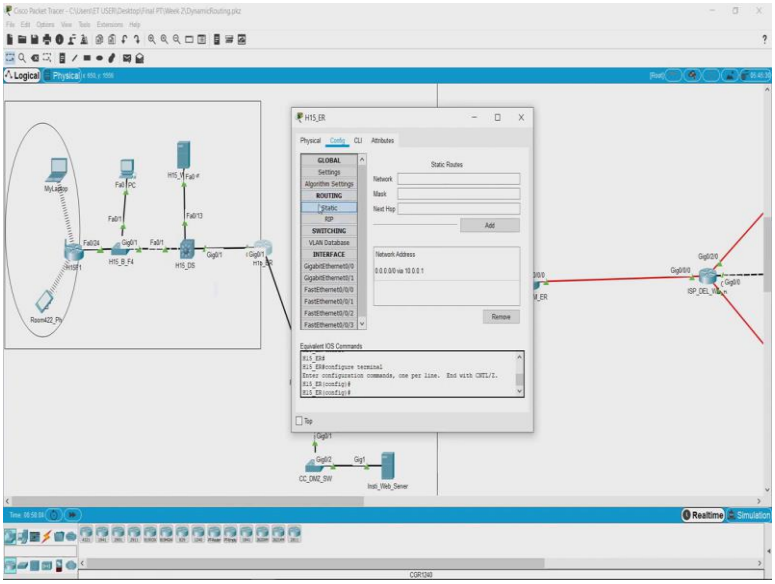

This is the network that we are considering for this video and we can see that there are multiple routers and switches in this network. Let us look at, this router, which connects the hostel network to the campus network. Now, if I click on this configure pack, we can see multiple configuration options here. There are two options available for routing purposes, one is static and we see that it has been populated with an entry, which reads as follows: 0.0.0.0/0 via 10.0.0.1.

Now, what this means is, the first part 0.0.0.0 is representative for all IP addresses. It is a pattern which matches with all IP addresses and this means that whatever might be the destination IP address, send it via the port which has the IP address 10.0.0.1. This is also what we call as default route or route of last resort. This is how we can check in gui interface

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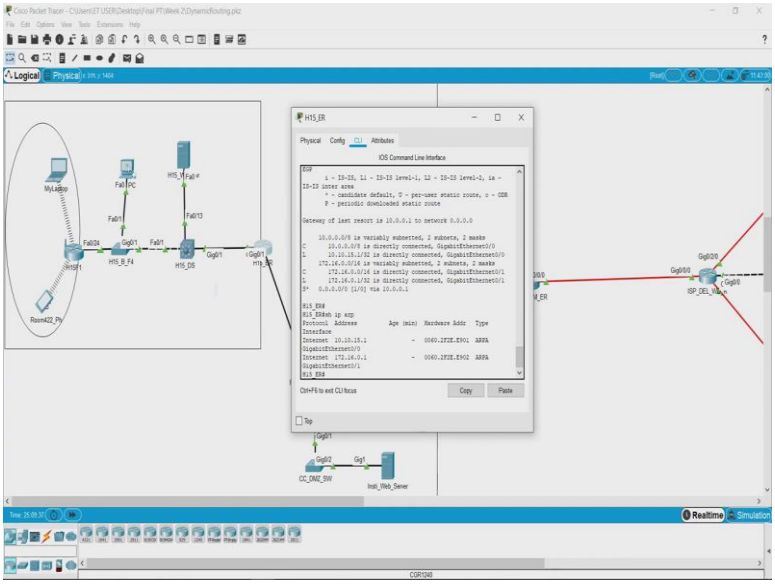

If we click on command line interface, then we will have to exit from the configuration mode and then, if we type in the command: ‘sh IP route’, we can see that these are the routes which are present in this router. And each of them is tagged with a letter, for example, ‘c’ means connected, that is, this route is directly connected to the router, ‘l’ means local which means that it belongs to the router and we can see here, ‘s’ which means static, that is, statically entered route which we saw in the previous tab.

This is how we can check for available routes in a router. We had learnt that for a router to be able to forward packet from source to destination, what it needs is a mapping between destination IP address and the port number of this router, that is, the port number along which it has to forward the packets so that it would reach the destination, the packet would reach the destination.

Another thing that a router would do is, maintain a list of MAC addresses corresponding to the IP addresses of its ports. In order to check that, the command we require is ‘sh IP arp’ and we get a table where it gives you the IP addresses corresponding to the hardware addresses or MAC addresses.

Now, why do routers need MAC addresses, you might be wondering, right? Let us assume, this is the router and it has received a response from server outside the campus network. Now it has to decide to which device, among these, it has to send the, it has to forward the packet to. Because router is not a broadcasting device, it sends the packet only to the receiver, it has to

have a mapping between IP address and the MAC address of the devices while working in a LAN environment.