Demystifying Networking
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Lecture – 34
Using network address translation to communicate on internet

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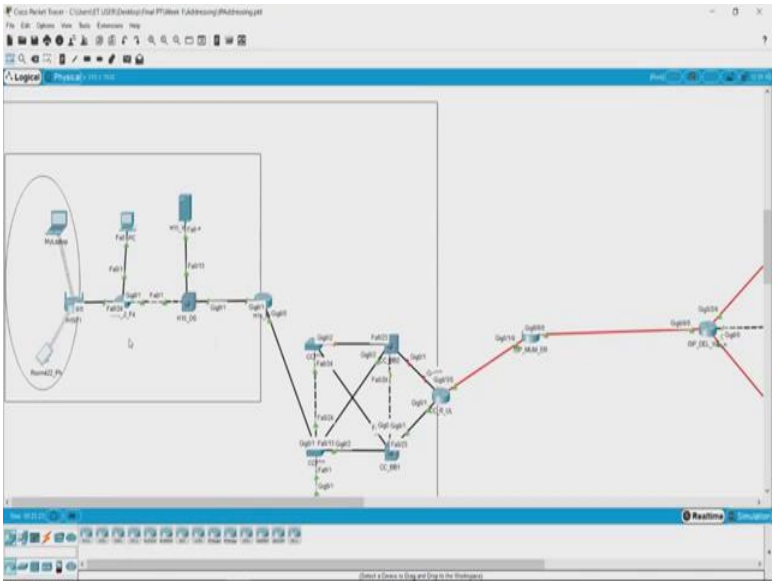

And, now the other thing that we wanted to see was, how are these devices able to communicate over the internet? Now to do that let us go into the simulation mode.

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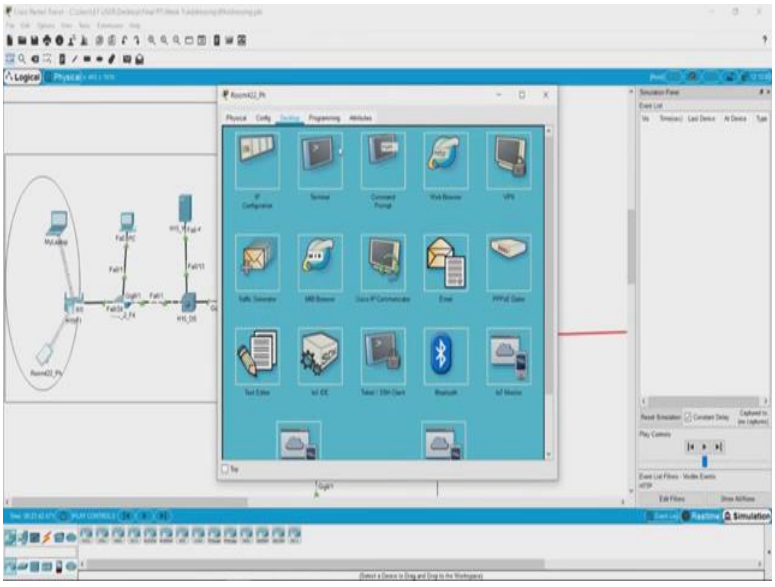

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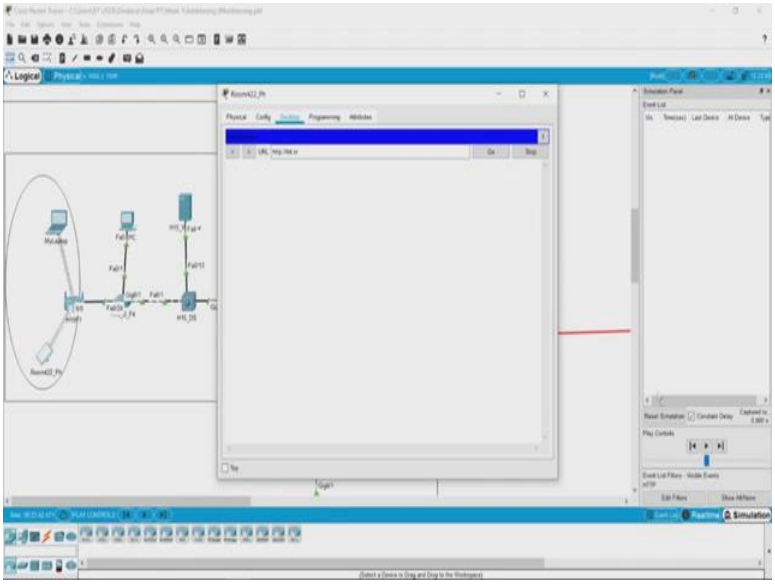

Now, we will open in the mobile, go to the browser and try to explore a website. Now, the address of this dummy website is ‘tnt.in’, which is ‘toursandtravels.in’, coming from the analogy that we looked in this week.

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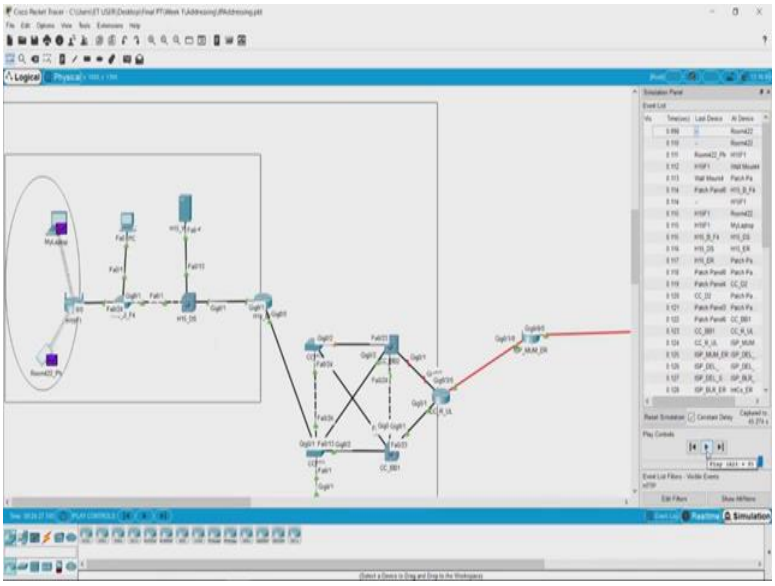

Now, as soon as we go, nothing would happen because this is simulation mode. So, let us increase the speed of the simulation and hit ‘play’. So, as soon as this happens we see that a communication has started happening and the packets are traversing the network. So, now, the

packet has left the network, now what we see here is, the communication has happened and the entire packet was sent to a server and it has reached back to the phone.

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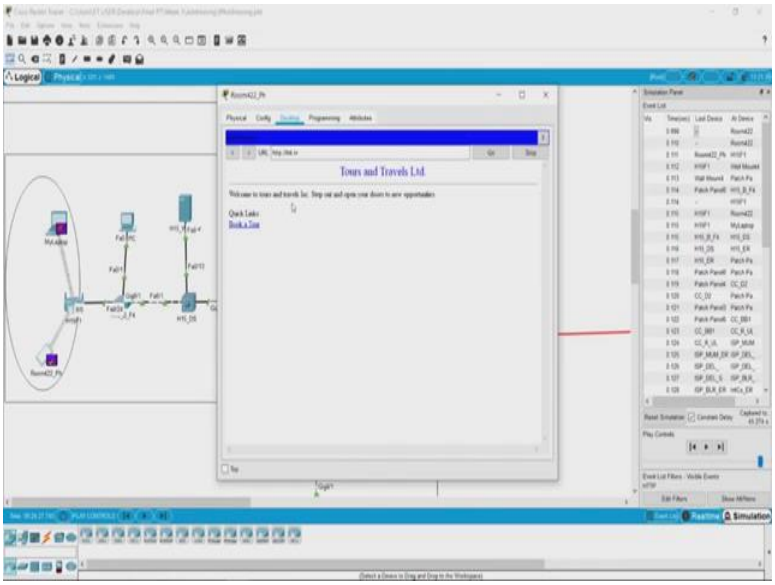

Let us open the phone and see. Yes. So, we have a website, dummy website here, tours and travels limited. Now, what happened over this communication? Let us look at the packets.

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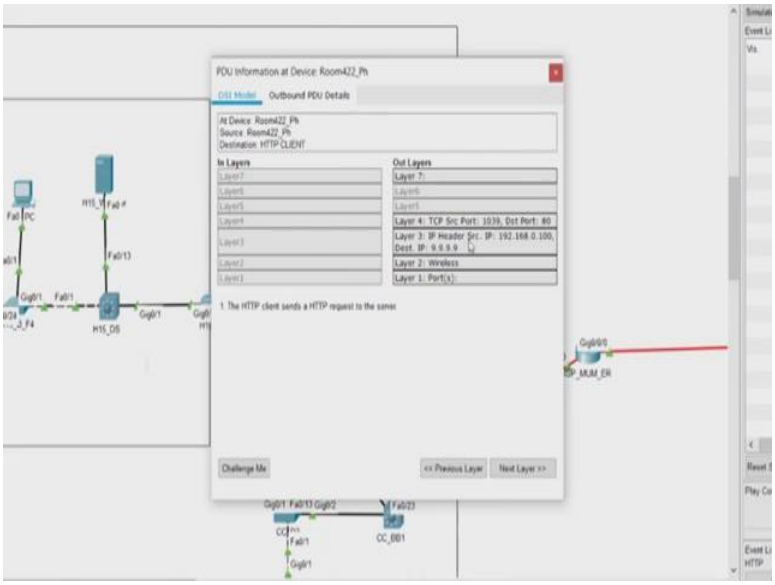

So, let us open the first packet and see what happens. So, here the source IP address of this communication, so right now we are filtering only a HTTP traffic, which is only web traffic,

so we have something called the source IP address, which is the IP address of the host or the mobile phone which was trying to get this website, which was 192.168.0.100 and destination IP address 9.9.9.9. So, how did the system get to know about this IP address? So, as we entered the name of the website, it took advantage of a service called DNS or Domain Name Services and with domain name services it was able to find out which particular IP address belongs to that website.

Once the communication has gone from the phone and it tries to go out of the hostel which is here. What we see here is, the communication from the distribution switch is going to the hostels edge router. Let us open and see what is happening here. Something interesting that we see here is, the IP address which is 172.16.15.4 here, when it is sent out of the router becomes 10.10.15.2. Now why did this happen? Now what happened, what is actually happening here is, we call network address translation.

So, the router over here gives it a IP address which is routable on the next network, but when the reply comes back, since the router keeps a track of the IP addresses which it has assigned to all the communication, is able to send it back to the original device. And, the similar thing happens when the communication leaves the campus. Now let us look at that particular instance, which is this one. Now, here what we saw was the IP address 10.10.15.2 which is a private IP address, got assigned an IP address, ‘1.6.1.2’ which is a globally routable IP address with the destination as the same. Now, where and how did this happen let us go into this router and see.

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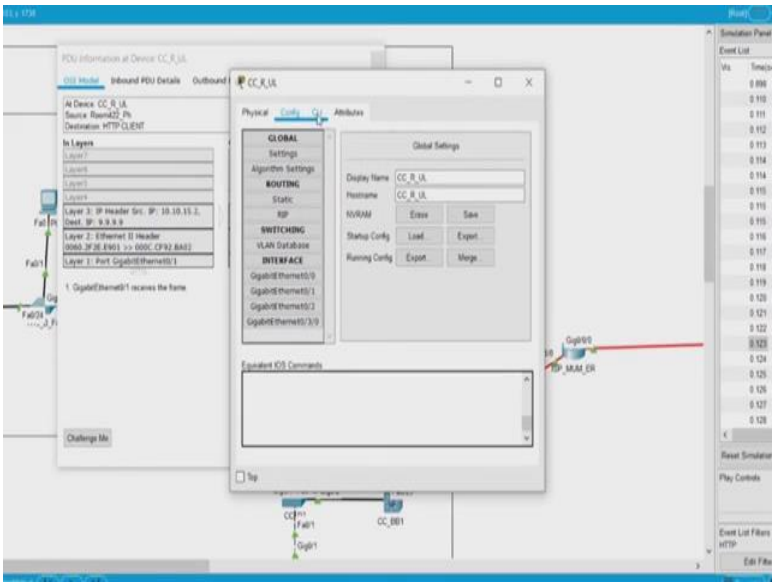

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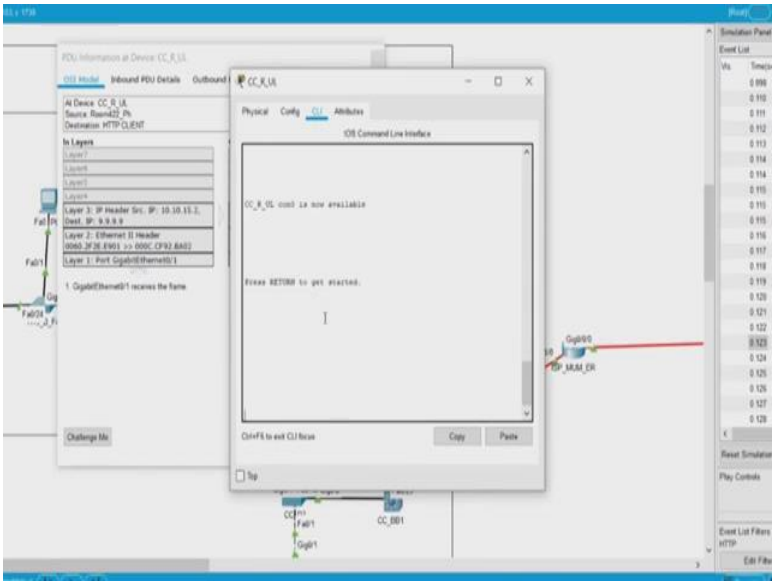

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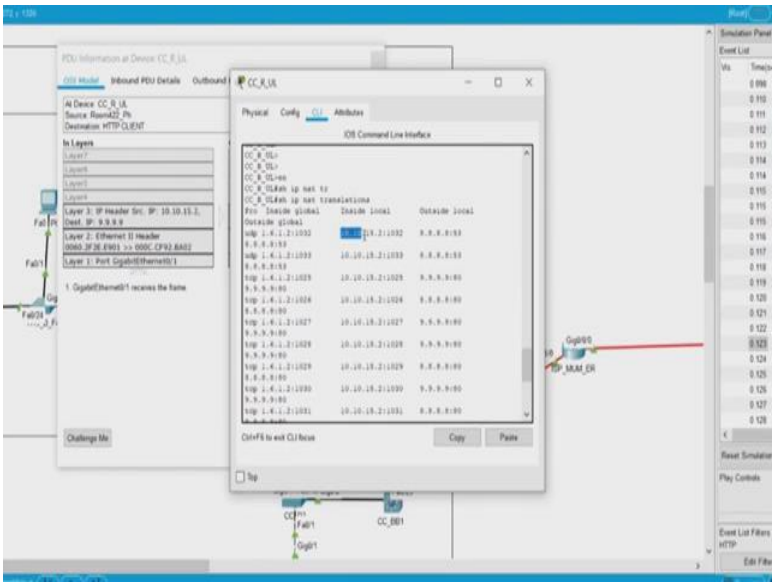

So, let us go to the command line, enable and see, what translation of network addresses happen. So, the command for that would be ‘show IP nat translations’. So, what we see here is, this IP address, which is the inside IP address was translated into this address that we see on the packet as well. So, let us close this.

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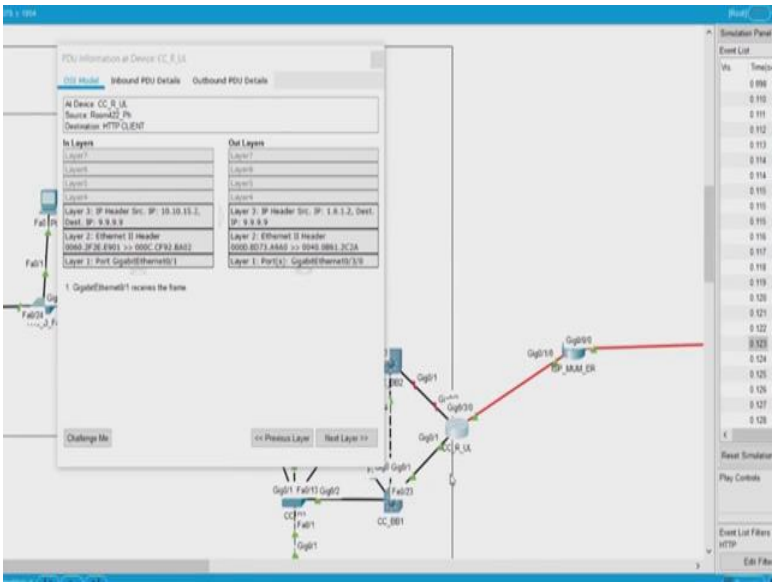

Now, this is how a private IP address is able to communicate over the internet because as soon as it leaves this router, it is given a global IP address, enters the router back, the router replaces

the global IP address with its local IP address. So, this is something called network address translation.