**Demystifying Networking**
**Department of Computer Science and Engineering**
**Indian Institute of Technology, Bombay**

**Lecture - 51**
**Summary of the week**

As we come to the end of this week, let us try to summarize what all we have learned.

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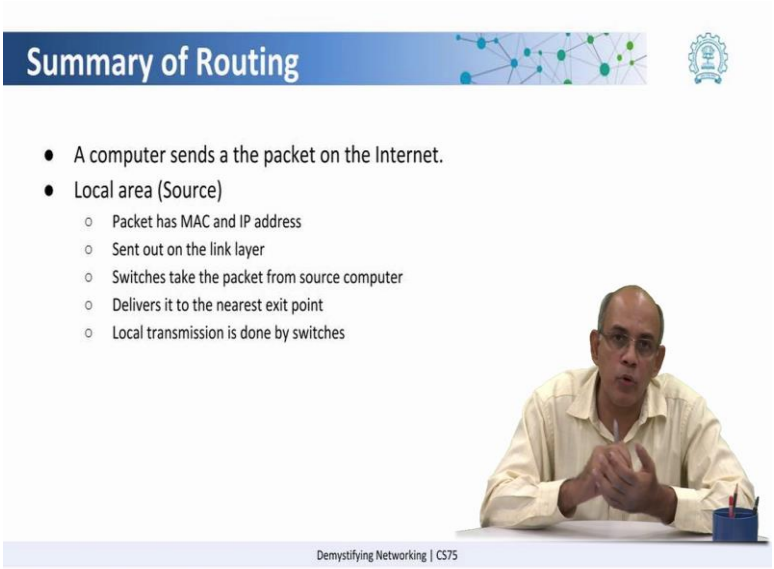


We started off with saying that, a source computer needs to send a packet to a destination computer somewhere on the internet. And we saw in the first step that it is in the local area. So, a packet has both a MAC address and an IP address at this point and it is sent out on the link layer. So, switches at this level, take the packet from the source computer to the nearest point of the internet for that local network. So, this entire local routing actually happens through a network of switches.

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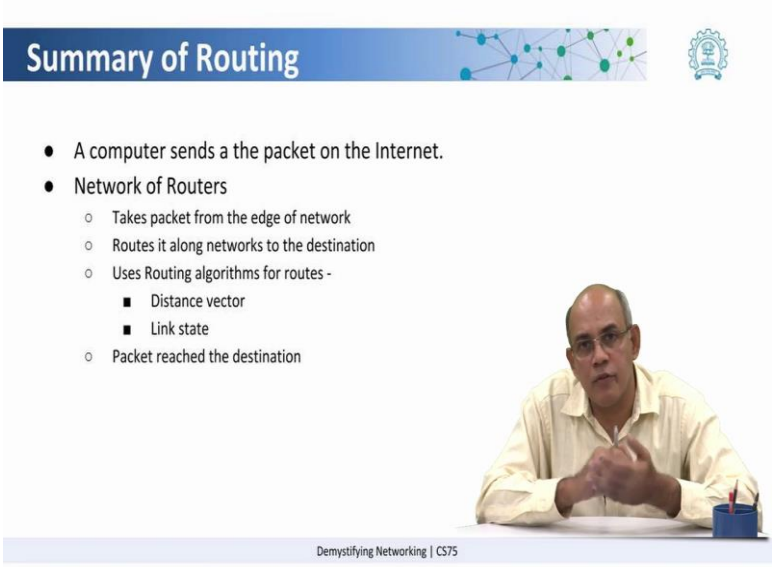


Then the router takes it from the edge of the network and ensures that the packet reaches the destination edge of the network. This happens through a network of routers in the internet using different routing algorithms that we have seen, such as distance vector based routing algorithms or link state based routing algorithms and eventually, the packet reaches the destination end on the internet.

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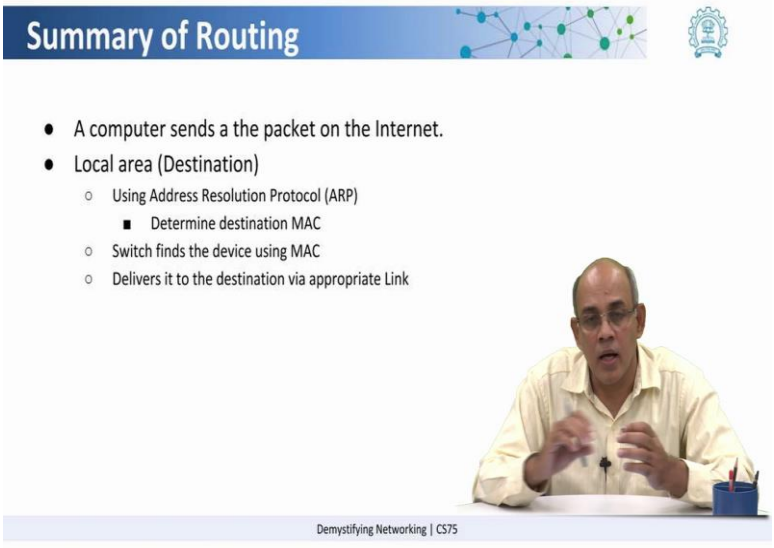


Now, after it reaches here, once again the local network takes over, where the switch now see is that here is an packet which is coming in for a particular IP address destination and then the

switch determines which is the computer which is associated with this IP address, finds out the corresponding MAC address and delivers the packet along that interface.

Once again the switch uses a protocol called the address resolution protocol in order to determine which is the machine to which the packet has to be delivered. So, if we look at it in abstract terms, both routers and switches actually perform the same function. Their job is basically to get a packet on the incoming link, determine which is the outgoing link to send this packet out on and send it on the appropriate outgoing link.

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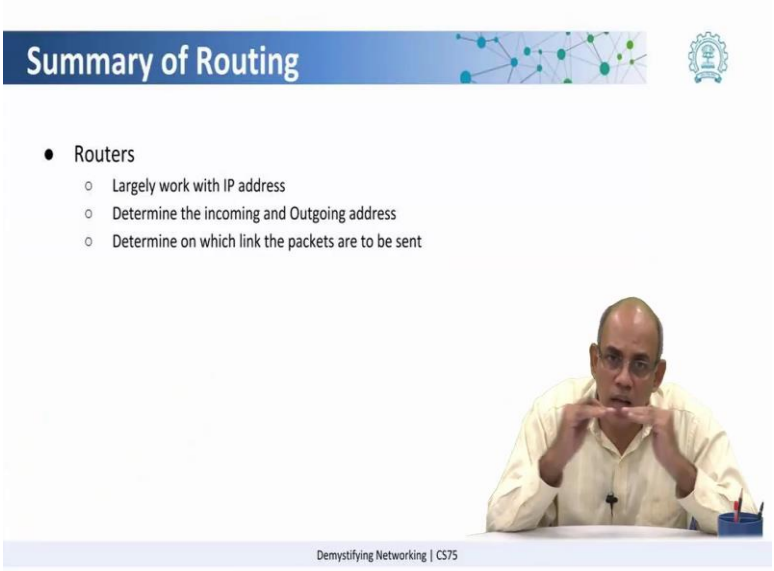


Routers have to largely work with IP addresses because they determine what is the incoming IP address, what is the destination IP address and try to determine what is the outgoing link on which the packet has to be sent.

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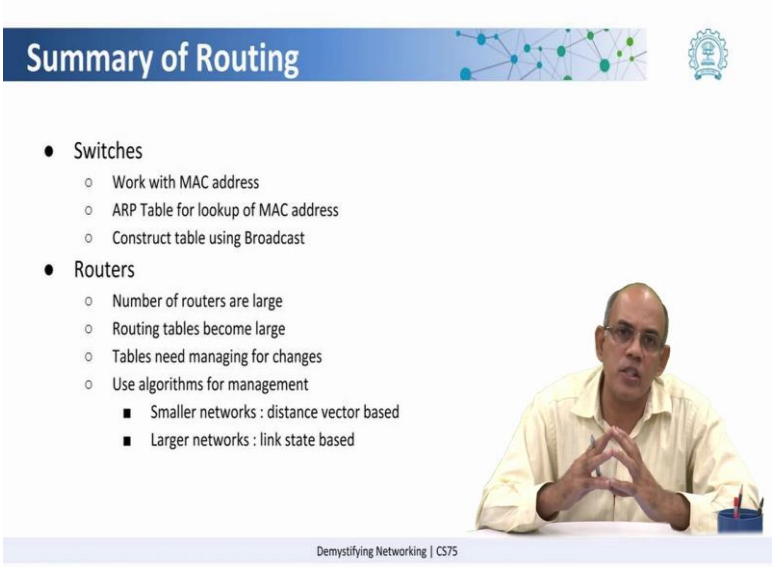


We also saw that in the case of a switch, the construction of this table is a fairly simple matter, it is called the ARP table and the mechanism by which the switch determines what is the destination MAC address is also fairly simple. It simply broadcasts into its local network saying who has this IP address and the corresponding machine responds with its MAC address, saying I have the IP address and it returns the MAC address.

In the case of routers on the internet, we saw that there are large number of routers and this can go into thousands, as a result of which routing table sizes can become very large. Also, we saw that there is a need to manage these routing tables. Hence, there are different algorithms that are used depending upon the types of networks. For small networks, there is the distance vector based algorithms. For larger networks, there is the link state based algorithms which are popularly used.

Now, that we have seen routing at a conceptual level, we have seen it at a demonstration level through packet tracer, you have worked through some assignments, it is time for you to apply your learning and do the next assignment yourself.