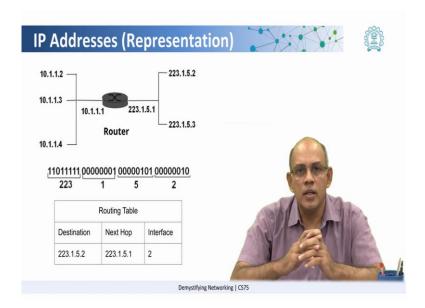**Demystifying Networking**
Department of Computer Science and Engineering
Indian Institute of Technology, Bombay

Lecture – 23
IP Addresses

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Now, let us look at this figure, in the centre you have this box. This box actually represents a router. What does a router do? Router is an end point of a network or in other words, it connects two different networks to each other. Router may have multiple interfaces, but on each interface it is a separate network. So, you can think of a router as a post office where the packets from one area come and then they are looked up and sent to other areas along different routes. So, let us look at one side of this network. So, on one side you see addresses of the form 10.1.1.2 and so on.

At the bottom we see that an IP address is nothing, but a 32 bit number. Ok. So, it is a 32 bit binary number, which for ease of human comprehension, is split into 4 octets. So, and each octet is now read in the corresponding decimal form. So, that is how one side of the network becomes what is called the 10.1.1 network. So, the network is often referred to using the name that is given to that router's interface. So, 10.1.1.1 is the router which is catering to the entire network of the other IP addresses that we see. So, each of these can be machines or they can even be local networks inside that. We will see how that happens, a bit later.

So, what this router is doing is, its connecting the 10. network to the 223. network. So, what does a router have? Suppose you look at the machine which says 10.1.1.2 wants to send a packet to the server which is at 223.1.5.2. So, essentially what will happen is, that the machine which is there at one end of the network, it knows where to send the packet in order to reach the router. In the router there will be a table which will say that if a packet comes on this line, with this IP address and wants to go out to that IP address, then it has to be sent out on that line ok.

So, this is a very conceptual level of explanation. Essentially, the routing table is simply mapping the input link, the input IP address to the corresponding output IP address and the output link. So, the router knows which is the link on which to send the packet or forward the packet, so that it goes towards the 223.1.5.2 machine.

While this is a very simplistic example we have only considered 1 router and 2 interfaces. The same idea keeps on extending in order for us to reach from anywhere in the internet to anywhere else in the internet.