**Introduction to Modern Application Development**
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**Module - 04**
**Lecture - 05**
**Networks**

Now, in this Module - 4, we will give you a very brief introduction to Networks.

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The outline of this module is that we will first talk about networks, and then we will get on to what the perhaps is the most important networks that are IP based IE internet protocol based networks.

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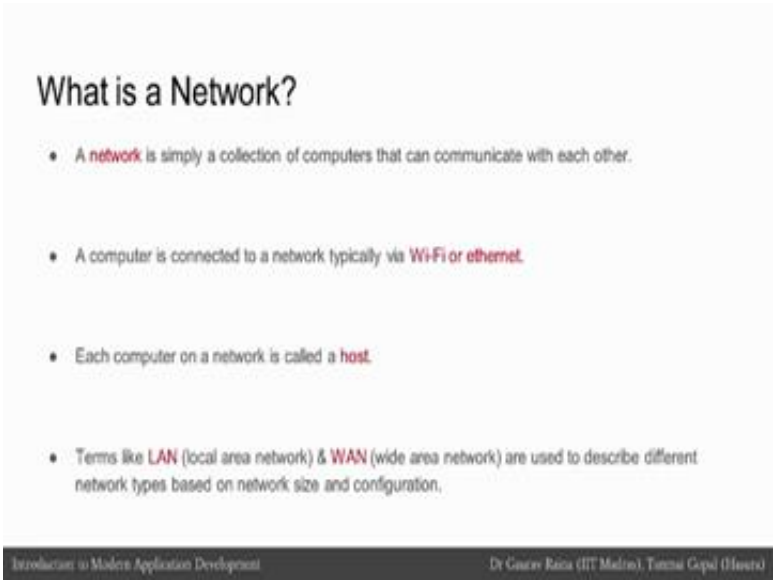


So, we asked the question what is a network? Now, a network is just simply a collection of computers that can communicate with each other. A computer is connected to a network typically via a Wi-Fi or Ethernet. Each computer on a network is called a host. And terms like LAN, which is local area network; and WAN - wide area network are used to describe different network types based on their size and configuration.

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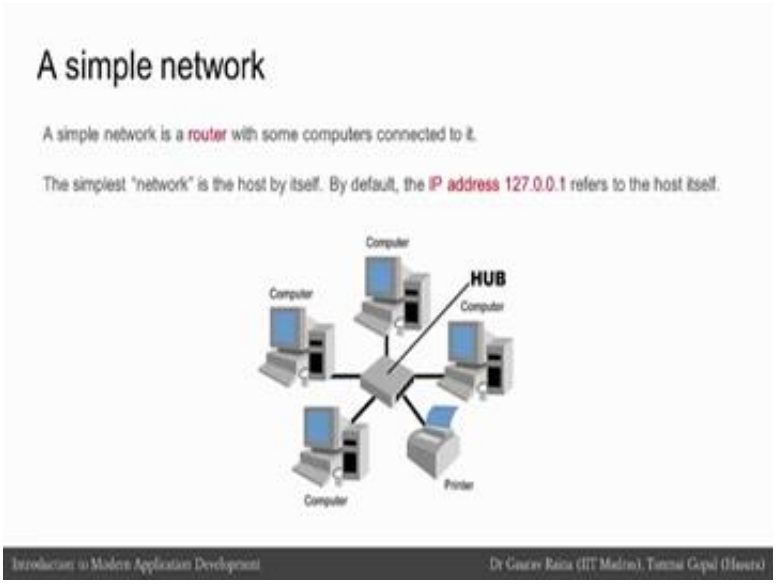

A very simple network is just a router with some computers which is connected to it. In a sense that the simplest network you can think of is actually just the host might serve. So, by default the IP address 127.0.0.1 refers to the host itself.

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Now, the network that you are really interested in is the internet; and the internet is the world's largest computer network. In fact, it is by far the largest engineers system that humans ever have built. And if you look at the size and the shared scale of the network it is almost by the surprise that it can still offer us all kinds of services fairly reliably. So, if you look at this particular picture of the internet, here each line is drawn between two nodes representing 2 IP addresses. It is really quite a beautiful picture of the internet.

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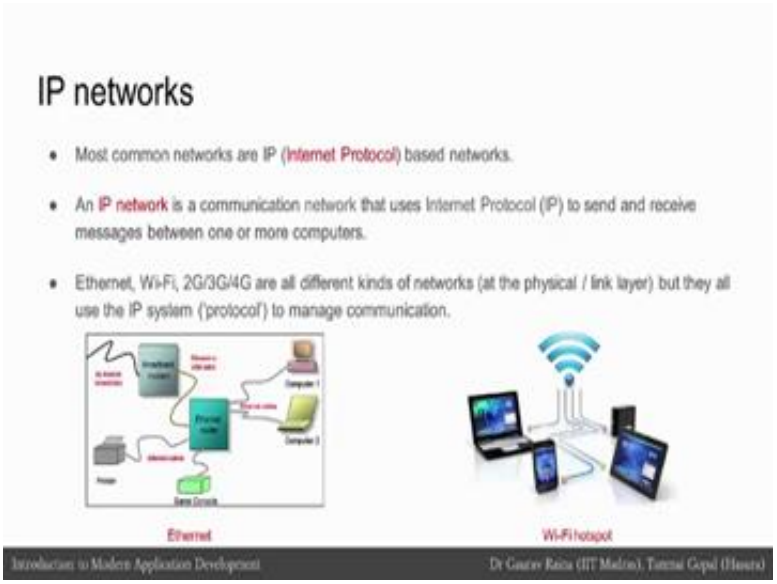


Now the networks that we interested in are IP networks. So, the most common networks are internet protocol based networks. An IP network is nothing but a communication network that uses the internet protocol to send and receive messages between one or more computers. Technologies such as Ethernet, Wi-Fi, 2G, 3G, and 4G are all different kinds of networks at the physical slash link layer but they all use the IP system quote on quote the IP protocol to manage their communication. Now, here is just take simply (Refer Time: 02:47) of an Ethernet type network, and you have example of a Wi-Fi hotspot.

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Now let us get out to IP addresses. Now every host on a network has a unique IP address that other hosts use to communicate with it. So, an IP address is a 32bit number for IPv4 typically represented in the format 0 to 255 dot 0 to 255 and so on. For example, you have the number 10.34.245.273 for better readability. Now, host could either have a fixed IP or a temporary dynamic IP assigned to it by the network every time it connects to it.

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Now a question is which program on the computer do you want to reach? So, even though our messages and data can reach the computer, how do we know which program to contact on the computer? Now programs used port numbers as addressers within the same computer. Port numbers vary from 1 to 65536. Web servers typically run on port 80 for http, and port 443 for https. The browser always tries to reach port 80 or 443 unless specified other ways.

For example, when you go to google.com that is equivalent to google.com colon 443 or hindu.com that is equivalent to the hindu.com colon 80; and http local host colon 8080 is the same as my custom web server listening on port 880 on my own computer.

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So, how do these programs really understand the each other's messages? Now web servers and clients agree to communicate in a format called HTTP, which is the hypertext transfer protocol. An HTTP is a format that mandates the following items - the URL, which is the uniform resource locator; headers, and method type, and body.

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So, we want to end this brief introduction to networks by making important statement and the statement is as follows that my browser is a program that can connect to some program - the server, on some machine somewhere on the network.

So, the important question that comes up is the following and that is how does this actually happen and it can happen in one of the following ways. If computers can discover each other, if computers can message each other in a way that both can understand each other, if a program can discover a specific program on a another computer, and if a program can message another program in a way that both can understand each other.

This effectively comes brings us to the end of this very brief introduction to Network, so where we wanted to highlight the importance of IP, IE internet protocol based networks.