Information Security 3
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Module 59
Review - 1

So in this module we will actually do a quick review of the different network concepts that we had discussed so that it will actually act as a summary of the different concepts that are very critical for us to remember in going forward and learning more about them, so we started originally with a definition of the internet in terms of like what are the different components of the internet like defining the end systems, defining what is a network application. We talked about that the communication links that really connect my network application running host with my end systems like a server and then we talked and defined about

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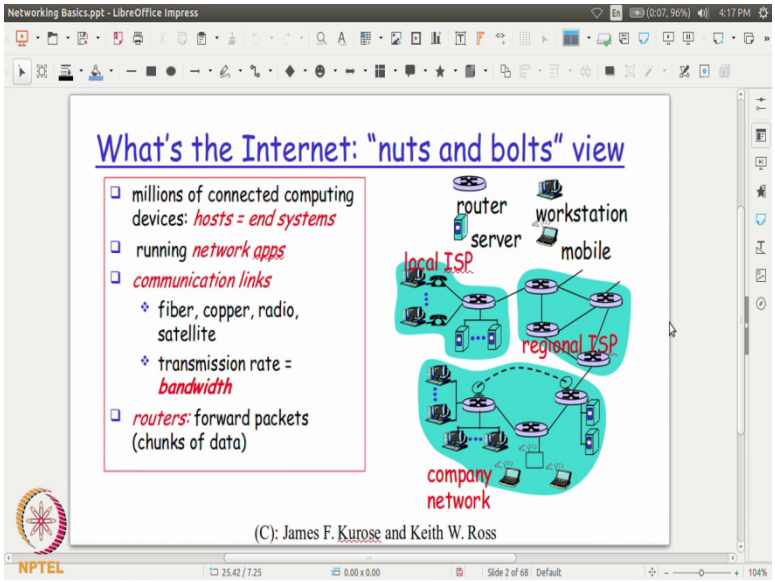

Things like bandwidth right, So then we had a look at what exactly is a protocol, we defined a protocol as means of communication that is usually used between two different devices in my network topology right,

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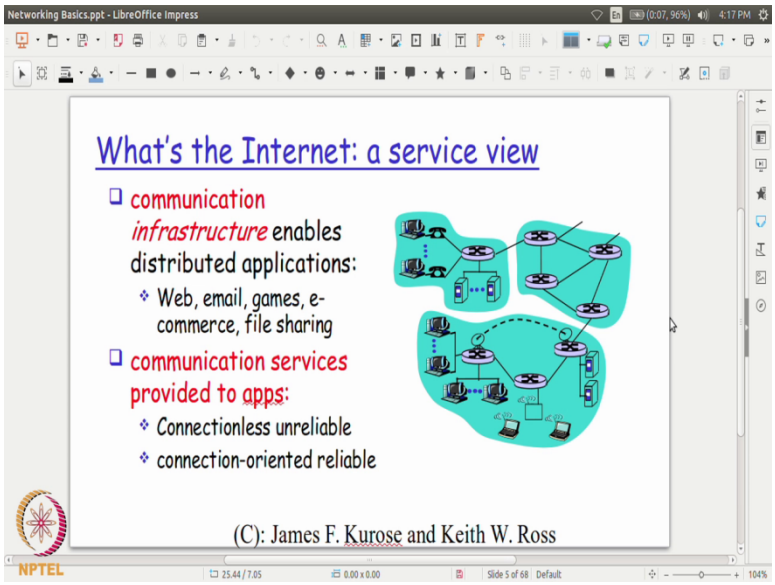

Then we defined network form the point of view of service where we talked about a connection oriented service.

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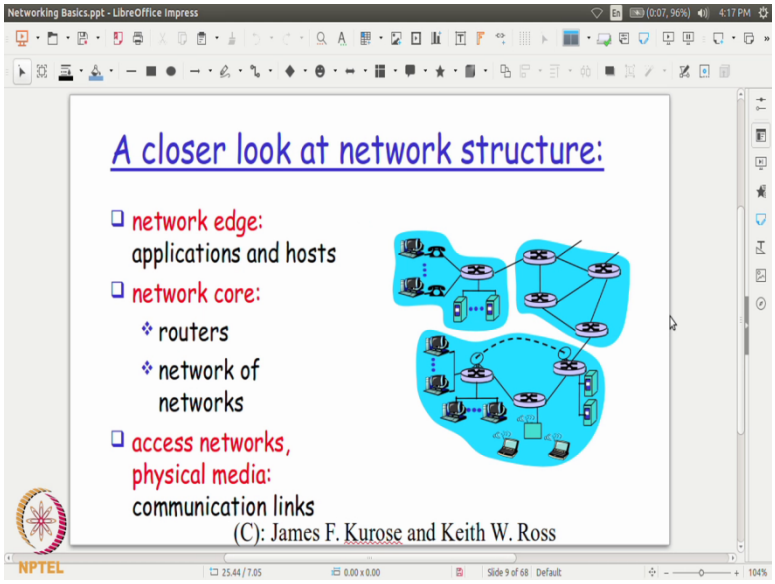

And a connectionless service, A connection oriented Service basically we mentioned about establishment of a connection between the two end systems where is in a connectionless service we talked about the data getting exchanged without going into the over heads of a connection

establishment right, then we had a look at the network edge and the network core wherein we defined a network topology a network edge we talked about how it is constituted by my applications.

Which are running as part of my client systems or my server systems and then we also defined a client and a server in this concept, whereas a network core was basically the devices, a set of devices that are basically part of the heart of my network right, so like the routers, the switches and the different kinds of devices,

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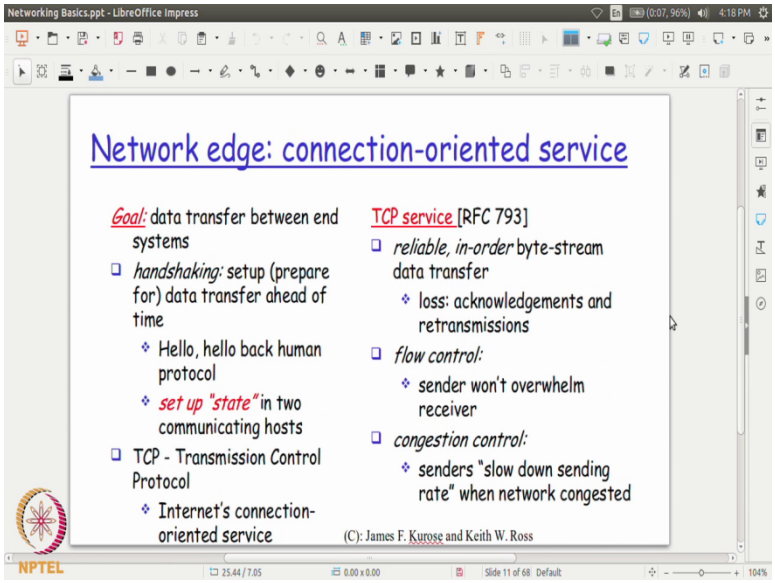

So we differentiated the end systems of the client and the server in the network edge and then we talked about what exactly is a TCP service. And what kind of features that a TCP service is providing, so TCP is basically providing a reliable in order bite stream, it provides flow control, it provides congestion control,

so when we say reliable in order bite stream we are talking of the exact amount of data in the same order with the sender has sent to be received by the receiver right, so when we talk of flow control we are basically talking of a mechanism where the sender is not overwhelming the receiver so that essentially the amount of data.

That other end is able to receive only that much amount of data is actually been sent to the receiver sent to the other side at any point in time where as the congestion control is a mechanism to take care of any kind of congestion on the network at any instant of time right, so these are the different services that my TCP is Actually providing.

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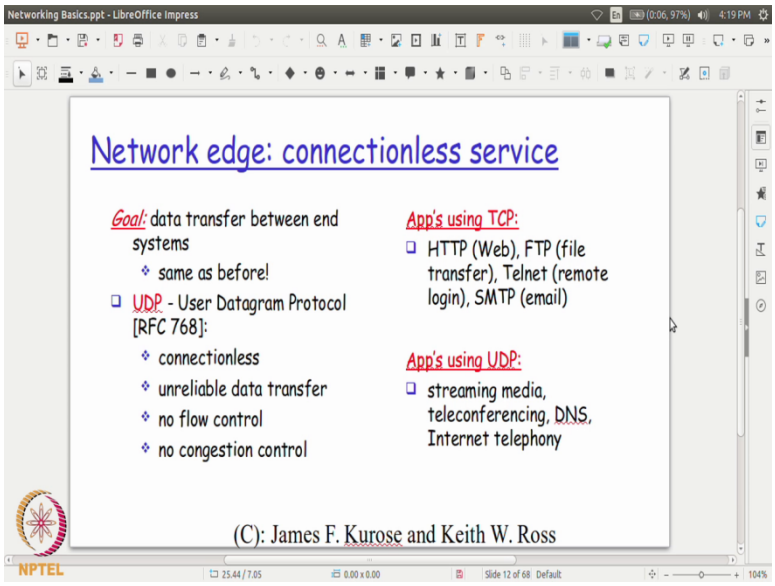

Now UDP is basically providing a connectionless unreliable data transfer, there is no flow control or congestion control provided in UDP.

And any kind of traffic that is actually latency sensitive right, like my audio video data or dns kind of a traffic or network management like my snmp related kind of traffic all make use of the UDP protocol right, whereas all other things like http and so on which requires 100% reliability they make use of the the TCP protocol,

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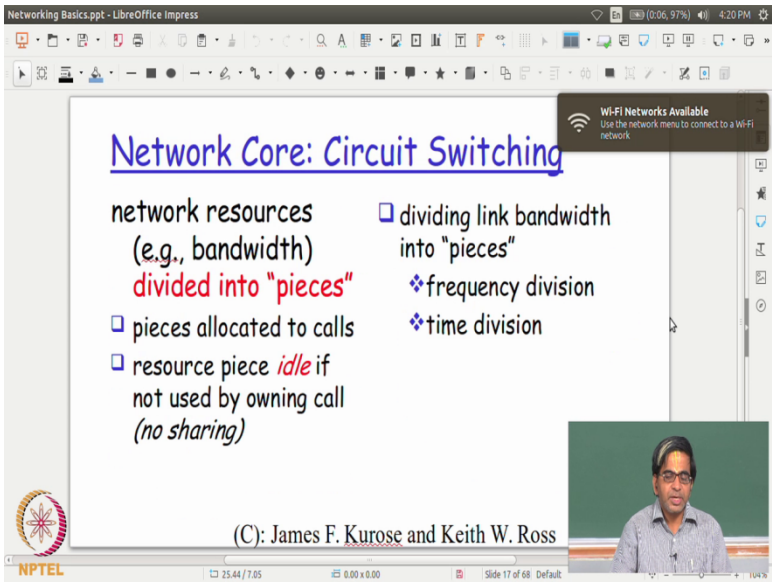

So then we talked about really circuit switching and data. Packet switching part of it, in circuit switching we talked about FDM verses TDM a frequency division multiplexing with a time division multiplexing, we saw the different advantages of the packet switching as compared to the the circuit switching part of it and saw the reasons behind why in today's network world at the backbone the IP protocol which is predominantly running is using the packet switching approach which is basically what gives me the maximum optimal utilization of my network backbone right,

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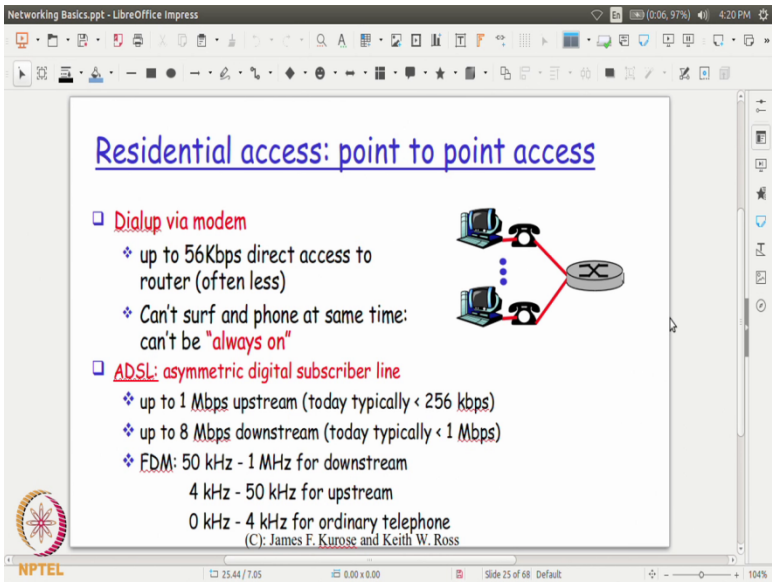

Then we looked at the physical media we had different media discussion about right from a dial up modem to adsl

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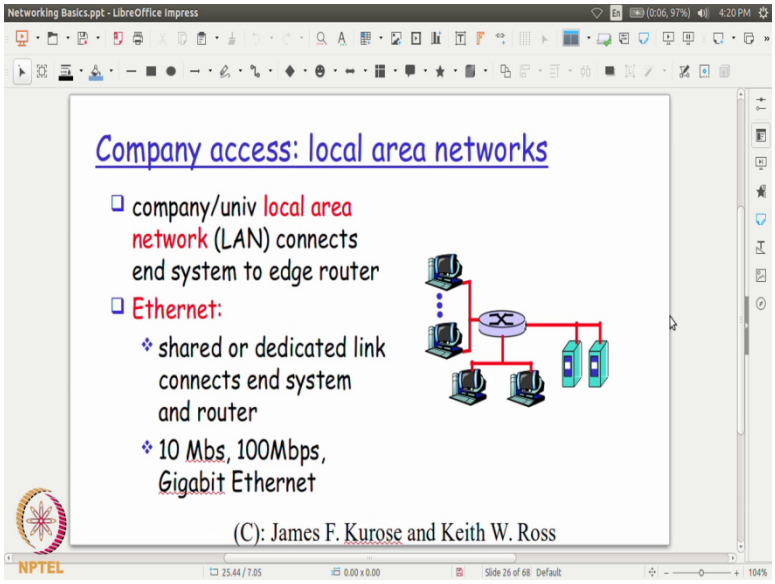

To talking about Ethernet.

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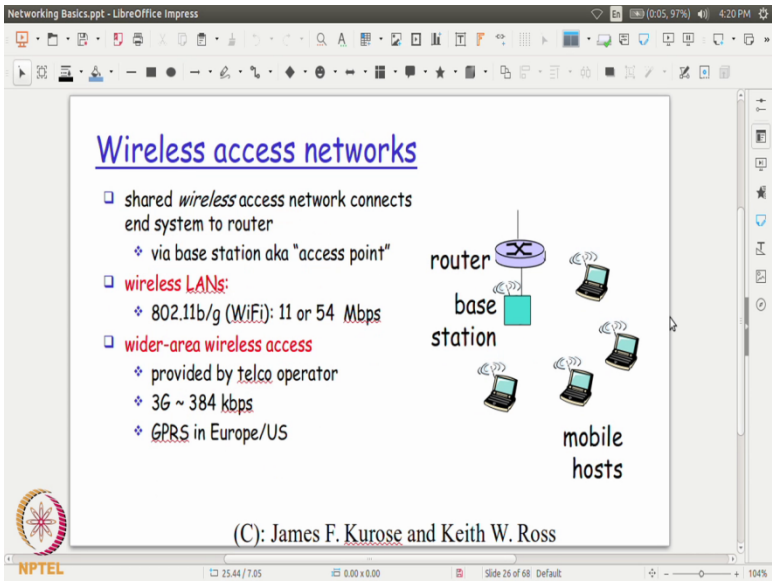

And then came to the wireless access networks, we talked about the kind of limitations that a wireless access network

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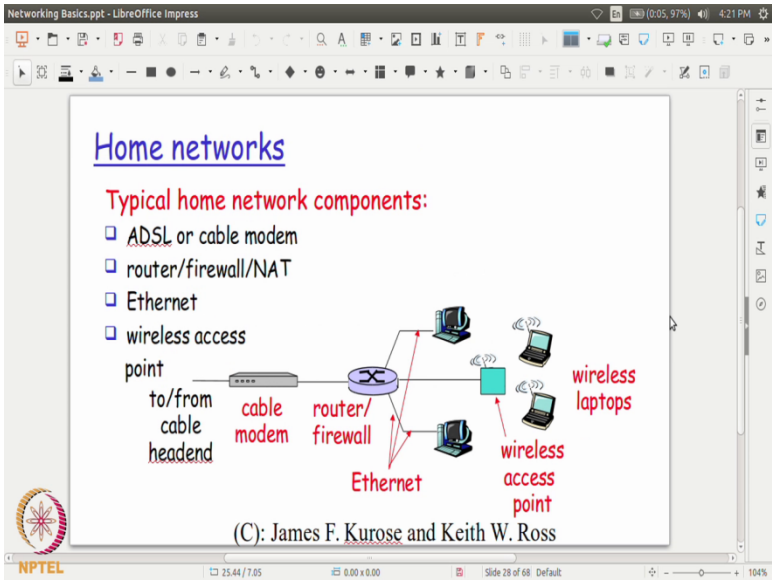

Typically has and discussed in detail about how a typical home network will be connected with right, so what are the different kinds of components that are there in the home network and what each of these components are suppose to do and what kind of responsibilities they are really having.

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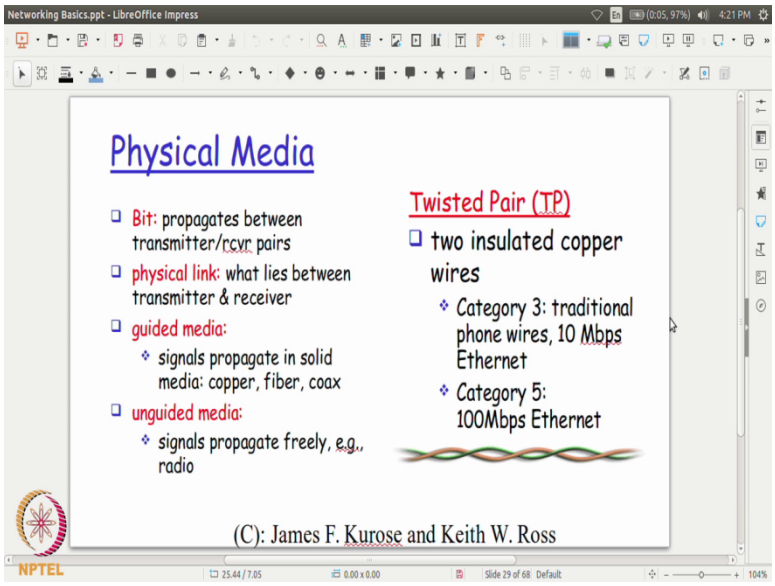

Then going into the physical media, we talked about the different types of physical media that I have right from a twisted pair

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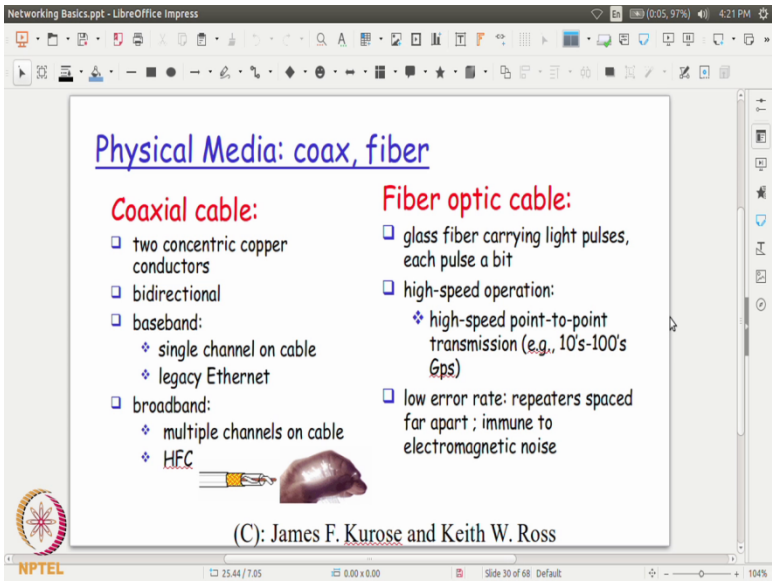

To a coaxial cable to a fiber optic cable, we talked about the capabilities of each of those different physical media.

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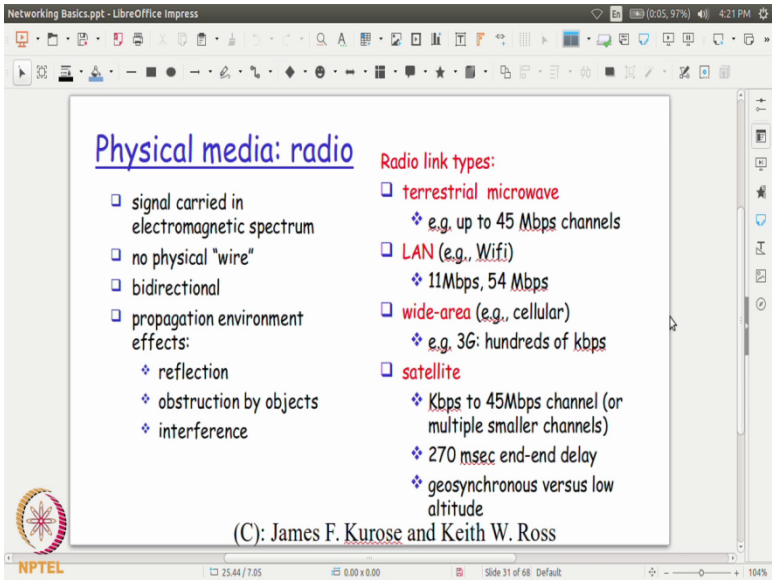

And then we were discussed very briefly about the different types of radio links also that is available like from a terrestrial microwave to a satellite link right, then we went into the different levels of ISP where we defined ISP, a tier one, tier two, tier three.

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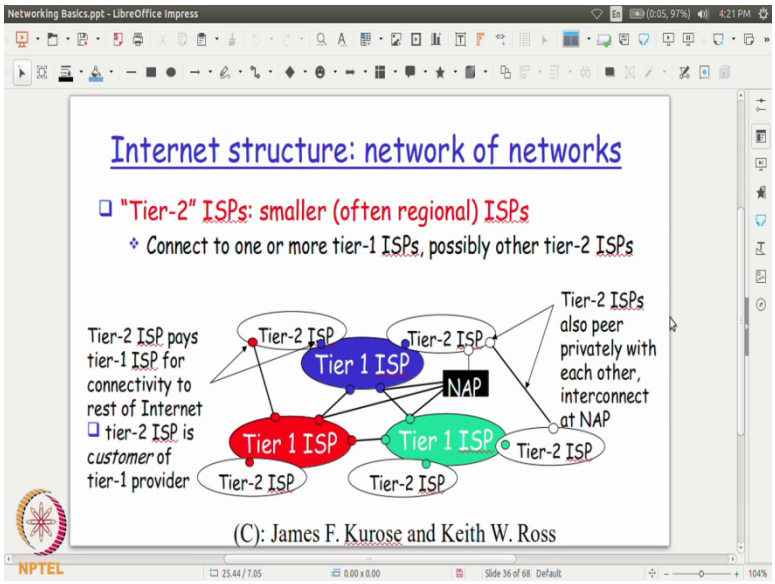

And talked about the coordinating points being referred to as a network access point for the connectivity between the two different ISP's at at a single level or between a higher level ISP to a lower level ISP right,

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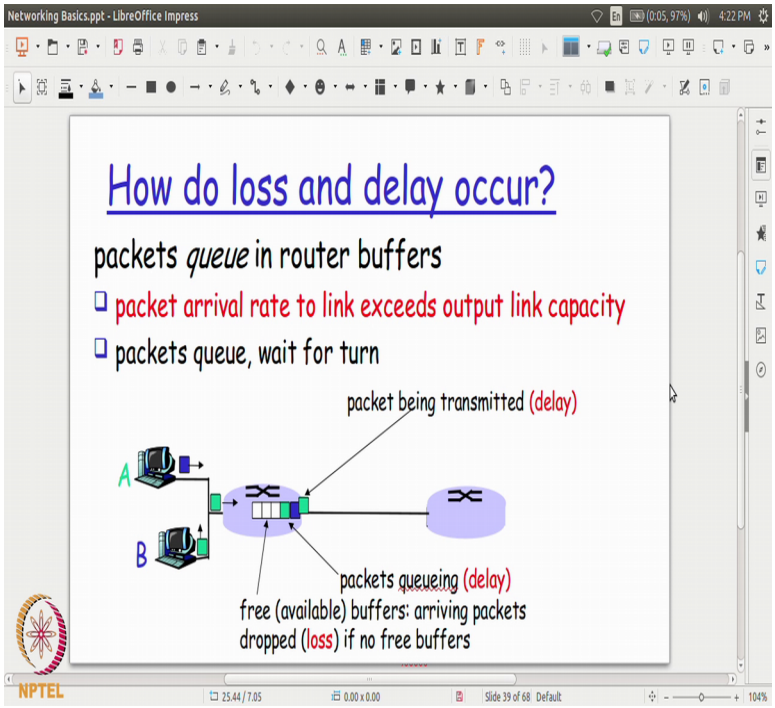

So then we started talking about the different types of delays that could potentially happened on a per packet basis, as if goes from a source to the destination across these different ISP's right,

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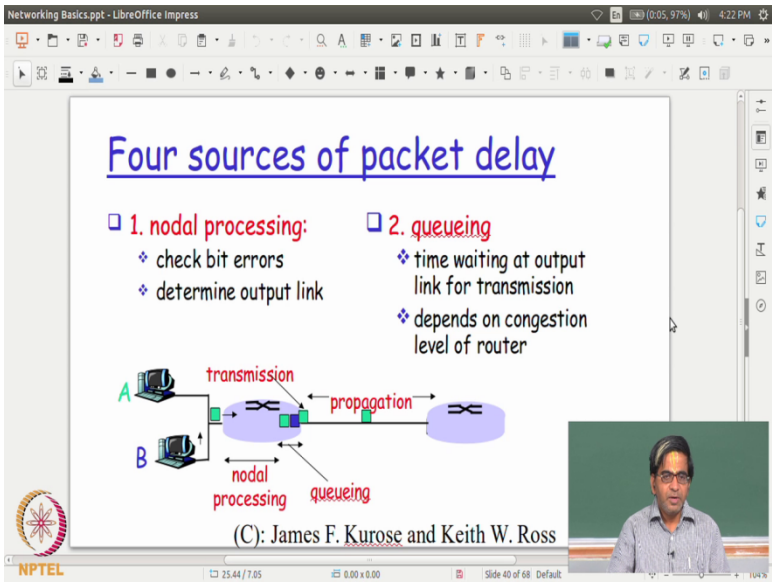

That is talked about the application called trace row when we which basically gave us the complete delay duration for a a packet to go from a source to the destination as it travels through the different ISP's right,

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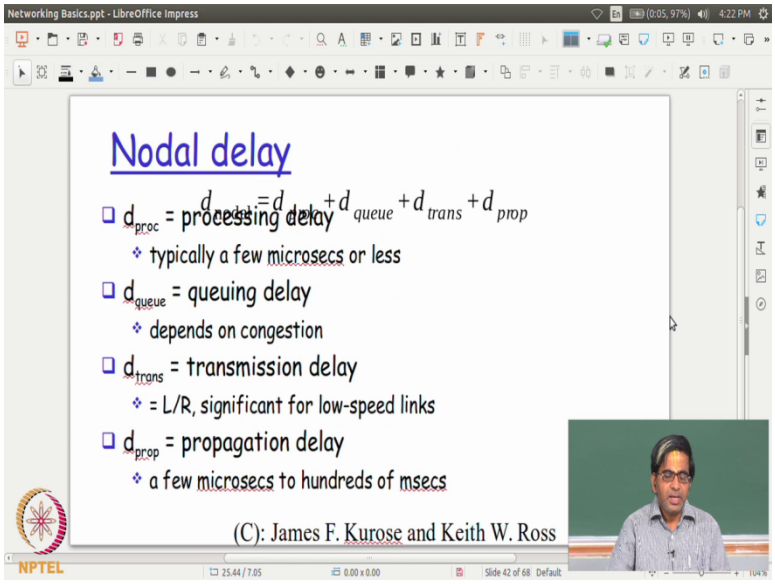

So we talked about the nodal delay and then we saw with the tray suit application

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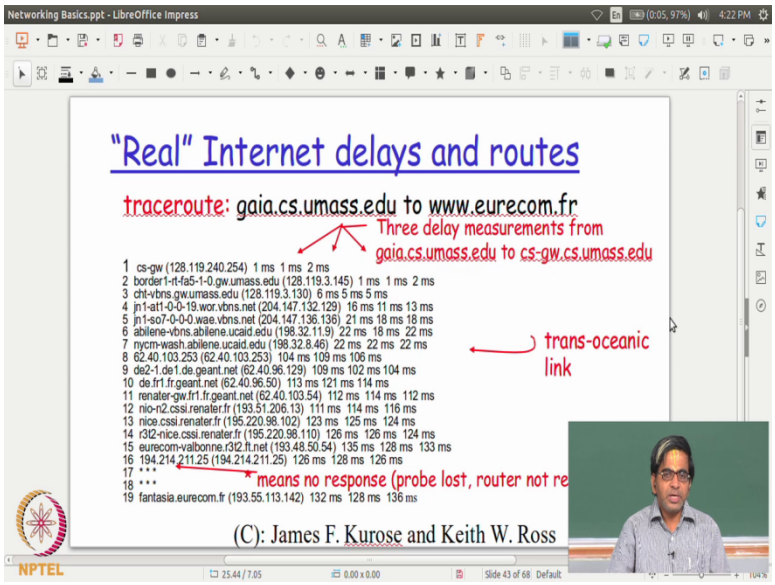

How this nodal delay is actually calculated and then displayed out as part of the output of this application right,

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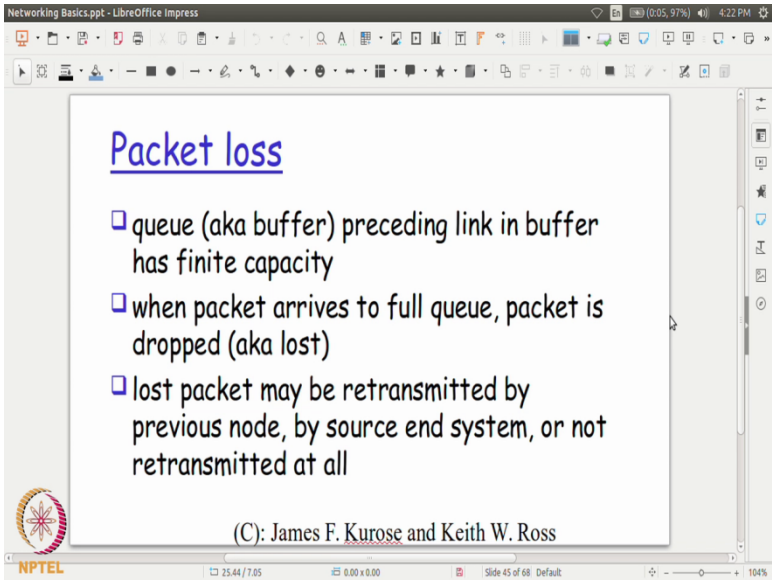

So then we defined about the packet loss.

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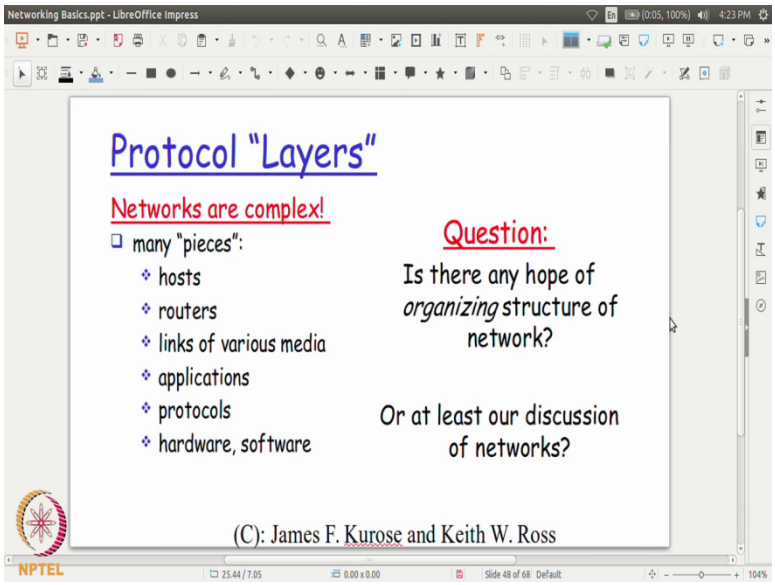

And went it to the definition of the protocol layers.

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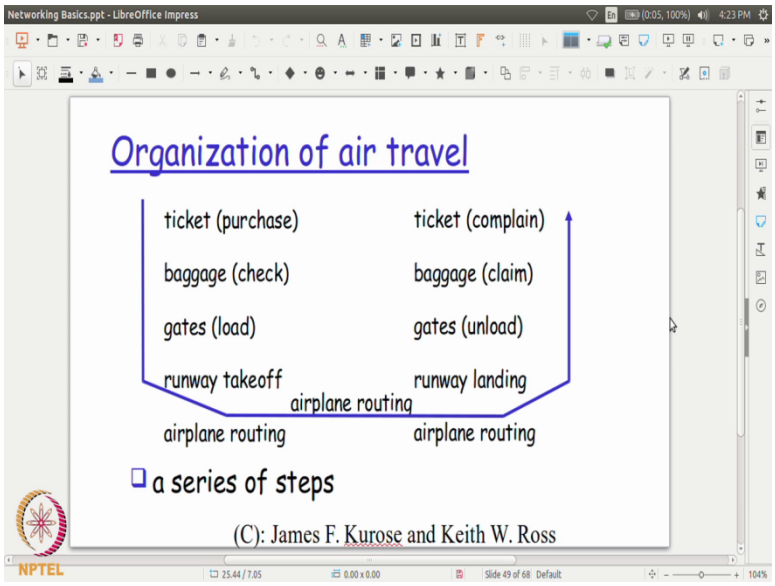

Where we looked at in a example of a typical I mean we looked at in an analogy of how we can actually talk about the different network layers and compare it with the typical air travel that we actually do right from purchasing the ticket at our source to coming out of the final destination after collecting our baggage at the end of our air travel right,

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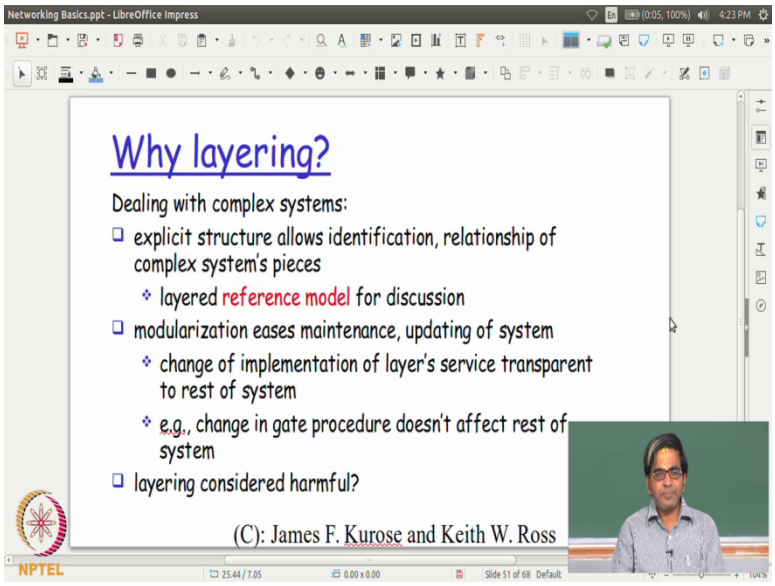

So the layering concept for that network stack was introduced

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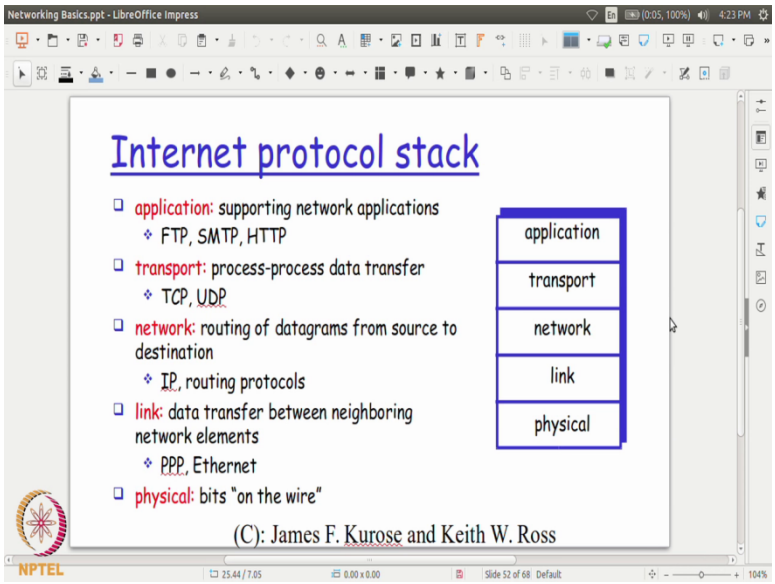

And then we discussed in detail about the five different layers along with the responsibilities for each of them

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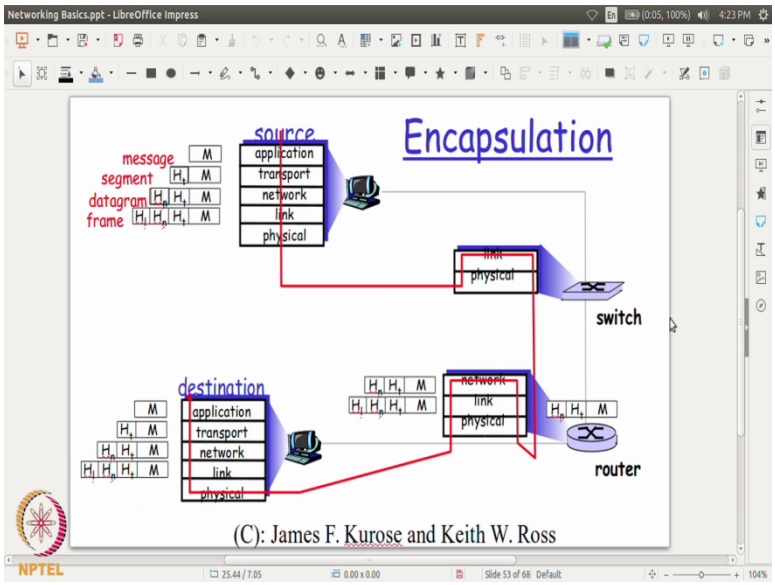

Where in we clearly talked about the packet encapsulation and de-capsulation and discussed how a packet from a higher level application goes.

Through and gets sort of encapsulated with the lower level headers as if goes through across each of the layers in my network stack down below till it reaches a physical level and then at the the the destination side how it gets de-capsulated for the final application to receive the original message that was sent out by the application right, so then we started looking at the different types of devices like an hub, a switch and how they basically work in terms of a switch becoming a self, a a managed switch.

By doing a self learning, how does it do a self learning and sort of build the switch table we looked with the couple of examples and then understood, then we try to compare the different types of devices with respect to the benefits in each of them.

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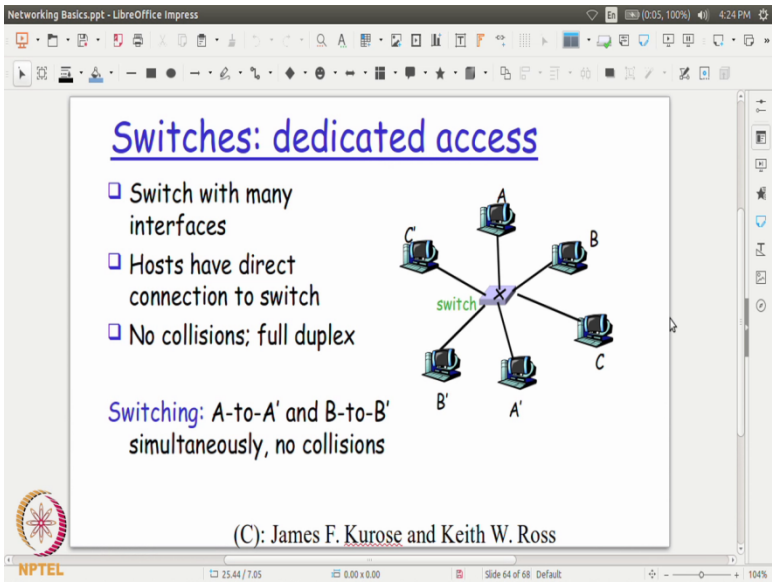

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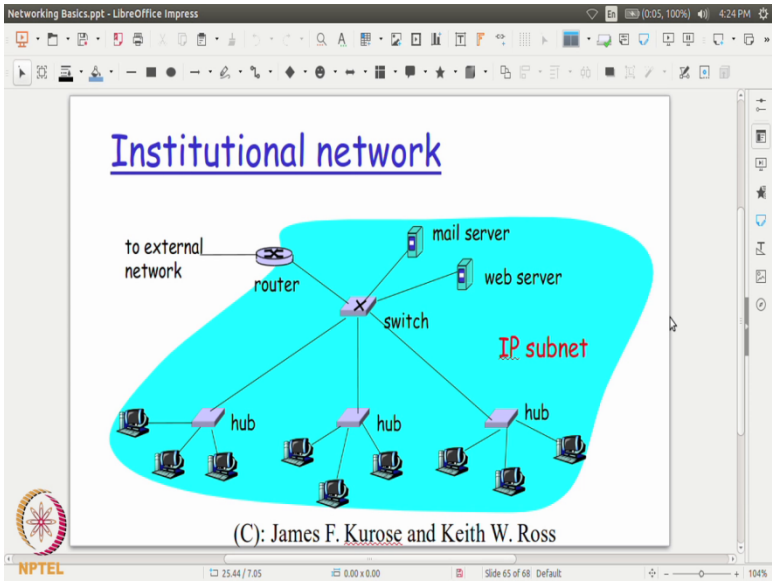

So that we could identify what device

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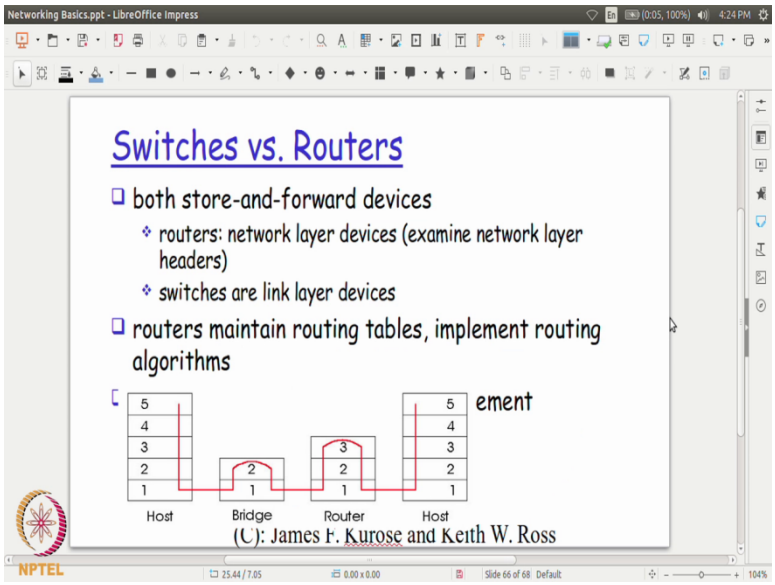

To be actually

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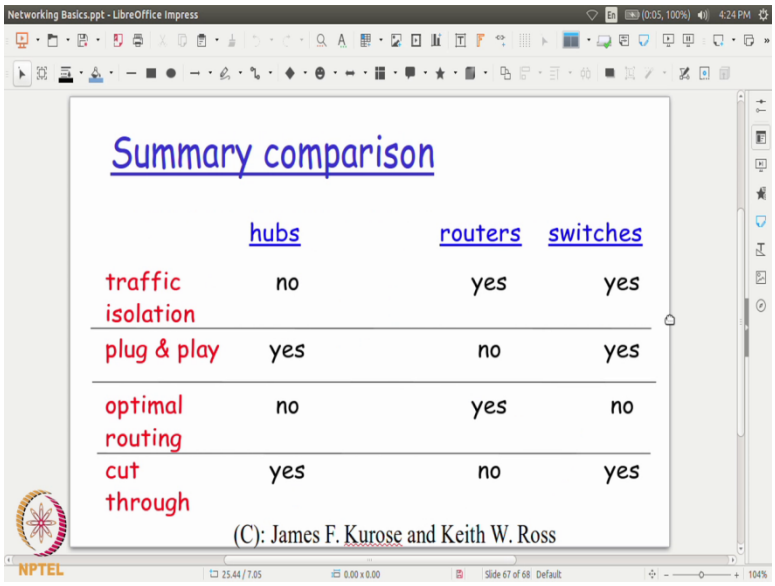

Making use of in different types of our requirements right, so this is basically what we actually covered as part of our networking basics, so the idea behind this discussion was to slowly introduce you to the concept of a networking world, especially the jargons that are typically employed there, the terminologies that are typically employed there to serve as a sort of an

appetizer for you to basically get into more details subsequently right, so this set of modules on networking should have hopefully given you a a basic level of foundation for you to understand the different terminologies especially when somebody is talking to you in the networking domain right.

So that was basically the the objective of having this set of modules in our discussion as part of this certification which will come in handy for you in our subsequent discussions on the various tools as part of information security.

Thank you.