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Department of Electronics & communication Engineering.

Computer Communication Network

Paper Solution –May 2010

UNIT –I

1. **a)What is ISDN?Expalin broadband ISDN with the architecture.** **10 Marks**
Solution : Refer Notes (Introduction ISDN) - Page No: 40 .Broadband ISDN Page No: 47.

b)Explain in brief the need and goal of computer network? **10 Marks**
Solution :Write on Buisness applications,Home applications,Mobile users, Refer Tanenbaum section1.1 for detail description .

c)what are the various physical topologies used in practical LAN and WAN's ? Expalin giving neat sketches and mention their relative merits and demerits. **10 Marks**
Solution : Refer Notes Page No: 20 -22.

UNIT –II

2. **a) Expalin design issues of data link layer in detail.** **10 Marks**
Solution : Refer Notes Page No: 69-88.

b) List the different type of protocols and explain Go-back n protocol in detail. **10 Marks**
Solution: Flow control Data Link Protocols: Unrestricted Simplex Protocol, stop and wait protocol, Simplex Protocol for a Noisy Channel.**Sliding Window Protocols:** One bit sliding window, Using Go-Back n, Protocol using Selective Repeat.
Refer Notes (**Go-back n protocol**) Page No: 97-99

c) Compare 802.4 and 802.5 IEEE standard. **10 Marks**
Solution : Refer Notes Page No: 134 -139.

UNIT –III

3. **a) What is Routing ?why it is essential ?Explain the basic types of routing algorithm.** **10 Marks**
Solution : Refer Notes Page No: 150-162.

b) Write Short notes on:
i) Broadcast routing
ii) Multicast routing **10 Marks**
Solution : Refer Notes (**Broadcast routing**) - Page No: 156-158 . **Multicast routing** Page No: 161-162.

c) Explain congestion prevention policies in detail **10 Marks**
Solution : Refer Notes Page No: 165-166.

UNIT –IV

4. **a)Explain ARP and reverse ARP in detail.** **10 Marks**

Solution : Refer Notes Page No: 181-185

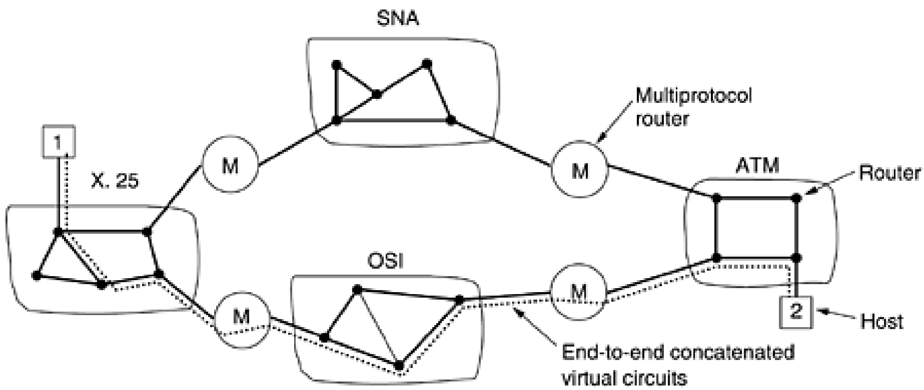
b) Explain IPV4 header format **10 Marks**

Solution : Refer Notes Page No: 186-197

c) Explain connection oriented and connection less internetworking in detail. **10 Marks**

Solution :

Two styles of internetworking are possible: a connection-oriented concatenation of virtual-circuit subnets, and a datagram internet style. We will now examine these in turn, but first a word of caution. In the past, most (public) networks were connection oriented (and frame relay, SNA, 802.16, and ATM still are). Then with the rapid acceptance of the Internet, datagrams became fashionable. However, it would be a mistake to think that datagrams are forever. In this business, the only thing that is forever is change. With the growing importance of multimedia networking, it is likely that connection-orientation will make a come-back in one form or another since it is easier to guarantee quality of service with connections than without them. Therefore, we will devote some space to connection-oriented networking below.In the concatenated virtual-circuit model, shown in Fig.below, a connection to a host in a distant network is set up in a way similar to the way connections are normally established. The subnet sees that the destination is remote and builds a virtual circuit to the router nearest the destination network. Then it constructs a virtual circuit from that router to an external gateway (multiprotocol router). This gateway records the existence of the virtual circuit in its tables and proceeds to build another virtual circuit to a router in the next subnet. This process continues until the destination host has been reached.



Once data packets begin flowing along the path, each gateway relays incoming packets, converting between packet formats and virtual-circuit numbers as needed. Clearly, all data packets must traverse the same sequence of gateways. Consequently, packets in a flow are never reordered by the network.

The essential feature of this approach is that a sequence of virtual circuits is set up from the source through one or more gateways to the destination. Each gateway maintains tables telling which virtual circuits pass through it, where they are to be routed, and what the new virtual-circuit number is.
This scheme works best when all the networks have roughly the same properties. For example, if all of them guarantee reliable delivery of network layer packets, then barring a crash somewhere along the route, the flow from source to destination will also be reliable. Similarly, if none of them guarantee reliable delivery, then the concatenation of the virtual circuits is not reliable either. On the other hand, if the source machine is on a network that does guarantee reliable delivery but one of the intermediate networks can lose packets, the concatenation has fundamentally changed the nature of the service.
Concatenated virtual circuits are also common in the transport layer. In particular, it is possible to build a bit pipe using, say, SNA, which terminates in a gateway, and have a TCP connection go from the gateway to the next gateway. In this manner, an end-to-end virtual circuit can be built spanning different networks and protocols.

Connectionless Internetworking

The alternative internetwork model is the datagram model, shown in Fig.below. In this model, the only service the network layer offers to the transport layer is the ability to inject datagrams into the subnet and hope for the best. There is no notion of a virtual circuit at all in the network layer, let alone a concatenation of them. This model does not require all packets belonging to one connection to traverse the same sequence of gateways. In Fig.below datagrams from host 1 to host 2 are shown taking different routes through the internetwork. A routing decision is made separately for each packet, possibly depending on the traffic at the moment the packet is sent. This strategy can use multiple routes and thus achieve a higher bandwidth than the concatenated virtual-circuit model. On the other hand, there is no guarantee that the packets arrive at the destination in order, assuming that they arrive at all.

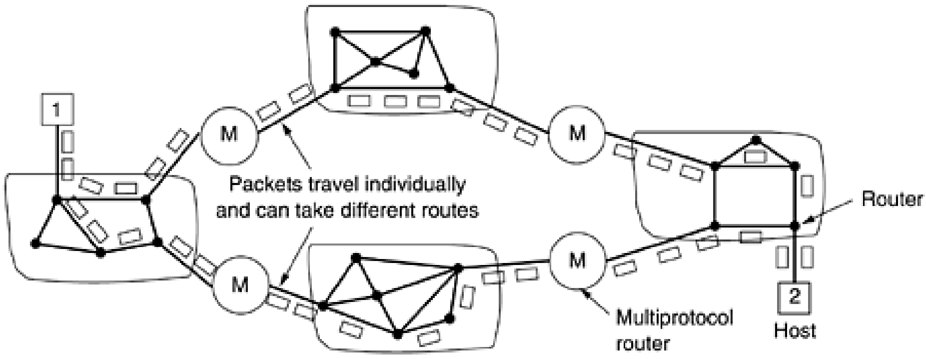


Fig: A connectionless internet.

The model of Fig.above is not quite as simple as it looks. For one thing, if each network has its own network layer protocol, it is not possible for a packet from one network to transit another one. One could imagine the multiprotocol routers actually trying to translate from one format to another, but unless the two formats are close relatives with the same information fields, such conversions will always be incomplete and often doomed to failure. For this reason, conversion is rarely attempted.

A second, and more serious, problem is addressing. Imagine a simple case: a host on the Internet is trying to send an IP packet to a host on an adjoining SNA network. The IP and SNA addresses are different. One would need a mapping between IP and SNA addresses in both directions. Furthermore, the concept of what is addressable is different. In IP, hosts (actually, interface cards) have addresses. In SNA, entities other than hosts (e.g., hardware devices) can also have addresses. At best, someone would have to maintain a database mapping everything to everything to the extent possible, but it would constantly be a source of trouble.

Another idea is to design a universal "internet" packet and have all routers recognize it. This approach is, in fact, what IP is—a packet designed to be carried through many networks. Of course, it may turn out that IPv4 (the current Internet protocol) drives all other formats out of the market, IPv6 (the future Internet protocol) does not catch on, and nothing new is ever invented, but history suggests otherwise. Getting everybody to agree to a single format is difficult when companies perceive it to their commercial advantage to have a proprietary format that they control.

Let us now briefly recap the two ways internetworking can be approached. The concatenated virtual-circuit model has essentially the same advantages as using virtual circuits within a single subnet: buffers can be reserved in advance, sequencing can be guaranteed, short headers can be used, and the troubles caused by delayed duplicate packets can be avoided.

It also has the same disadvantages: table space required in the routers for each open connection, no alternate routing to avoid congested areas, and vulnerability to router failures along the path. It also has the disadvantage of being difficult, if not impossible, to implement if one of the networks involved is an unreliable datagram network.

The properties of the datagram approach to internetworking are pretty much the same as those of datagram subnets: more potential for congestion, but also more potential for adapting to it, robustness in the face of router failures, and longer headers needed. Various adaptive routing algorithms are possible in an internet, just as they are within a single datagram network.

A major advantage of the datagram approach to internetworking is that it can be used over subnets that do not use virtual circuits inside. Many LANs, mobile networks (e.g., aircraft and naval fleets), and even some WANs fall into this category. When an internet includes one of these, serious problems occur if the internetworking strategy is based on virtual circuits.

UNIT –V

5. **a) Draw the TCP header format and expain it.** **10 Marks**
Solution : Refer Notes Page No: 226-228

b) Expalin ATM –AAL protocol in brief. **10 Marks**
Solution : Refer Notes Page No: 245-249

c) Write Short note on Domain Name system. **10 Marks**
Solution : Refer Notes Page No: 252-255