

Network Layers Design Issues

* Network layer is majorly focused on getting packets from the source to the destination, routing, error handling and congestion control.

Various functions of Network Layer:-

* Addressing

Maintains the address at the frame headers of both source & destination and performs addressing to detect various devices in network.

* Packeting:-

This is performed by IP.

* Routing

→ It is the most important functionality.

→ The network layer chooses the most relevant and best path for the data transmission from source to destination.

* Inter-networking:-

It works to deliver a logical connection across multiple devices.

Network layer's design issues:-

1. Store and Forward Packet Switching:-

The host sends the packet to the nearest router. This packet is stored there until it has fully arrived once the link is fully processed by verifying the checksum then it is forwarded to the next routers till it reaches the destination. This mechanism is called "Store & Forward Packet Switching".

2. Services Provided to transport layer:-

Based on the connections there are 2 types of services provided.

* Connectionless:-

The routing & insertion of packets into subnet is done individually. No added setup is required.

* Connection oriented:-

Subnet must offer reliable service and all the packets must be transmitted over a single route.

3. Implementation of Connectionless Service:-

* Packets are termed as "datagrams" & corresponding subnet as "datagram subnets".

* When the message size that has to be transmitted is n times the size of the packet, then the network layer divides into n packets and transmits each packet to routers via a few protocol. Each data packet has destination address and is routed independently irrespective of the packets.

4. Implementation of Connection oriented Service:-

It can be done in either two ways:-

* Circuit-switched connection

* Virtual circuit-switched connection.