DATA LINK ASSINGMENT GROUP 6

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1. A call request is sent from the source computer to the destination computer. It contains a Virtual Circuit Identifier that is unique in order to identify packets sent using this link. The routing tables in the switches are used to determine the appropriate port for the propagation of the request to the destination. The call request, if accepted by the destination, sends back a call acceptance packet back to the source. It also contains a Virtual Circuit Identifier to identify packets sent in the established circuit. The path followed by the request and acceptance packets becomes the path followed by the packets awaiting transmission. Upon establishing the virtual circuit connection, The Virtual Circuit Table is filled in the various fields it contains; Incoming port, outgoing port, and the VCI of the incoming and outgoing packet. When the call request is sent, only its incoming VCI, incoming port and outgoing port are input into the Virtual Circuit Table. Upon arrival at the destination, it acquires an outgoing VCI number, being the first packet to receive such. The acceptance packet backtracks this path, allowing for the filling of the previously unknown outgoing VCI slot. In essence, the incoming VCI of a packet in a switch n becomes the outgoing VCI of switch n-1. When transmission is complete, a termination request is sent to the destination terminal. When it accepts, it sends back an acknowledgement that also deletes the entries made into the Virtual Circuit Table for that particular group of packets, thus terminating the link.

1. Store and forward contains a buffer to store incoming packets that are waiting to be processed. This technique waits for an entire frame to arrive before forwarding it so that error checking can take place. Store and Forward technique also performs error checking, forwarding correct frames and discarding frames with errors

In Virtual Circuit Packet Switching, The Store and forward uses the first packet, usually the call request, to determine one path for all related packets whereas in Datagram packet switching, each packet processed by the store and forward technique can find a different path to the same destination.

1. Circuit switching is expensive to implement compared to Packet switching because it needs a physical path between source and destination. Bandwidth is used more efficiently in Packet switching because no reservations are made prior to transmission compared to Circuit switching where bandwidth is wasted as the channel is still in commission even when not in use. Packet switching allows for error correction due to store and forward technique where as there is no method for error checking and correction in Circuit switching
2. **Effect of router failure on communication :** This would lead to delays in a virtual circuit as a new channel will need to be established for all remaining packets to be transmitted whereas this would have little to no effect on a datagram because packets can use multiple routes to arrive at the destination
3. **Router memory space:** Less space is taken up in routers used for virtual circuits because only one tabulated route will be used in the transmission of packets whereas more space is used in Datagram because each packet is routed differently thus need for more space in the router as more entries to the routing tables of routers are expected.