

1> Compare ATM and ISDN

1> (A) Asynchronous Transfer Mode (ATM)

(i) It is cell relay, packet switching network and data link layer protocol which encodes data traffic into small (53 bytes = 48 bytes of data + 5 bytes of header) fixed sized cells.

(ii) ATM provides data link layer services that run over Layer 1 links. [Fixed sized packets are used]

(iii) ATM is a connection-oriented technology, in which a logical connection established between the two end points before the actual data exchange begins.

(iv) It is an International Telecommunication Union-Telecommunications Standards Section (ITU-T) efficient for cell relay's and it transmits all information including multiple service types such as data, video or voice which is conveyed in small size packets called cells.

(v) Cells are transmitted asynchronously and the network is connection-oriented.

(vi) Making an ATM call requires first sending a message to set up a connection. Subsequently all cells follow the same path to the destination. It can handle both constant rate traffic and variable rate traffic. Thus it can carry multiple types of traffic and end-to-end quality of service.

(vii) ATM networks use "packets" or "cell" switching with virtual circuits. Its design helps in the implementation of high performance multimedia networking.

Field length in bytes

5

48

Header

Payload

ATM Cell Format

Workstation

ATM switch

ATM switch

Router

LAN Switch

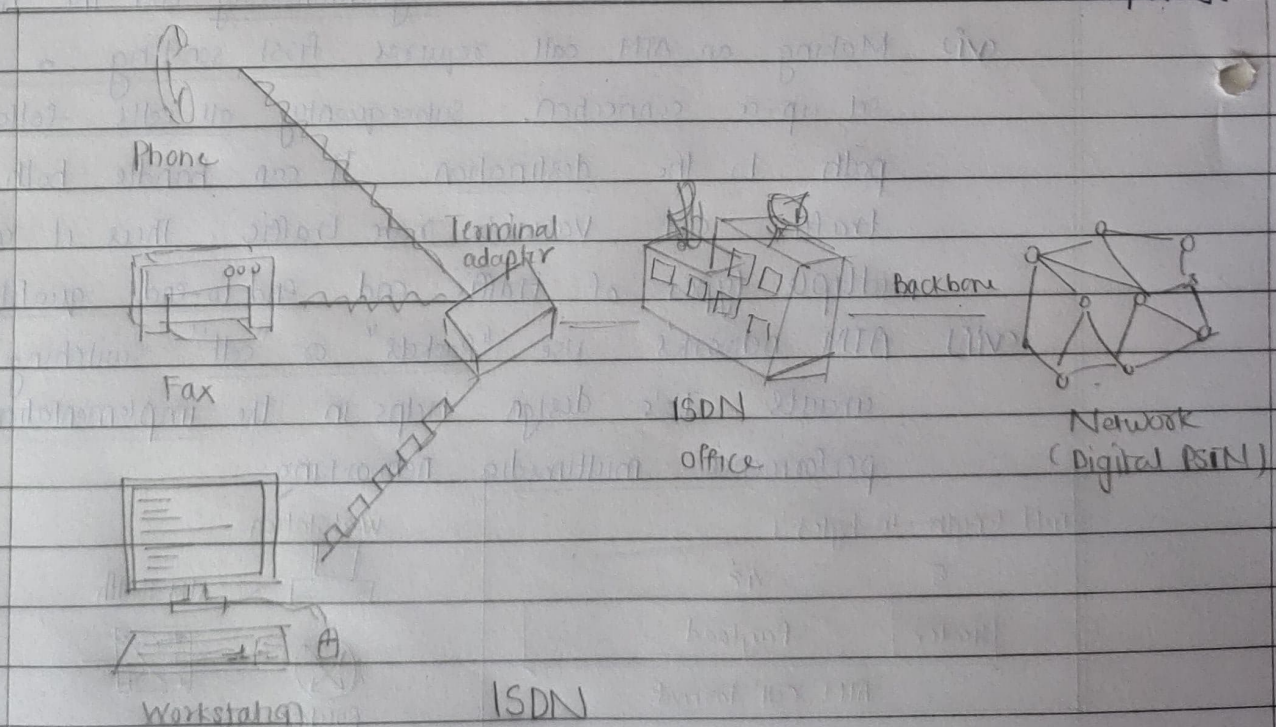
ATM Network

Router



## (B) ISDN [Integrated Service Digital Network]

- (i) These are set of communication standards for simultaneous, digital transmission of voice, video, data and other network services over the traditional circuits of the public switched telephone network.
- (ii) The main feature of ISDN is that it can integrate speech and data on same lines, which were not available in classical telephone system.
- (iii) ISDN is circuit-switched telephone network system, but it also provides access to packet switched networks that allow digital transmission of voice and data.
- (iv) ISDN provides simultaneous voice, video, and text transmission between individual desktop <sup>& group.</sup> video conferencing system.
- (v) ISDN is a set of international communication standards designed in 1980's and improved in 1990's.  
→ provides single interface for hooking up telephone, fax & computers.





2> Compare classical IP over ATM.

2> ① ATM is connection-oriented while IP is connectionless.

⇒ This means that the establishment of connection between two points in ATM defines the route all cells related to that connection must travel. Each data cell traversing the route carries an address specific to the link it is currently on, and this address is not globally unique. If route broken, new connection is established before data transfer can resume.

⇒ Each IP packet carries a full destination address and there is no concept of connection at IP level. As a consequence, there is no reason that consecutive IP datagrams need to traverse the network by same route, providing they arrive at the required destination.

② If consecutive IP datagrams travel different routes, they may arrive at their destination in different order in which they were transmitted. Therefore, IP cannot guarantee order, and higher layers may need to re-order packets as they arrive.

Conversely, as cells on given connection travel by same path, there is no reason for them to arrive out of order, and thus ATM guarantees that cells, if they arrive, will arrive in ORDER.

③ ATM assumes links are highly reliable and have very low rates of cell loss & cell corruption, which IP makes no such assumptions.

SUBMITTED BY:

BHAGYA VINOD RANA

UI9CS012