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Punjab Technical University

B.Tech. – Computer Science & Engineering (Sem. – 6th)

Asynchronous Transfer Mode

Subject Code: CS-306

2 Mark Questions:-

Q:-1) Define Frame? (May 2012)

Ans:-1) **Frame** :- Data transmission term for variable-size packet of data bits in a particular format and with codes (called flags) that mark the beginning and end of the packet. A frame generally contains its own control instructions, and information for addressing and error detection.

Q:-2) What is the significance of Cell Loss Priority? (May 2012)

Ans:-2) **Cell Loss Priority (CLP)** is a flag bit in the ATM cell header that determines the probability of a cell being discarded if the network becomes congested.

Cells where the CLP = 0 are *insured* traffic and unlikely to be dropped. Cells with CLP = 1 are *best-effort traffic*, which may be discarded in congested conditions in order to free up resources to handle insured traffic.

Q:-3) Write the advantages of ATM? (May 2012)

Ans:-3) ATM provides a flexible and scalable solution to the increasing need for quality of service in networks where multiple information types (such as data, voice, and real-time video and audio) are supported. With ATM, each of these information types can pass through a single network connection.

ATM can provide the following benefits:

- High-speed communication
- Connection-oriented service, similar to traditional telephony
- Fast, hardware-based switching
- A single, universal, interoperable network transport
- A single network connection that can reliably mix voice, video, and data
- Flexible and efficient allocation of network bandwidth

Q:-4) Define Payload? (May 2012)

Ans:-4) Payload: - When data is sent over the Internet, each unit transmitted includes both header information and the actual data being sent. The header identifies the source and destination of the packet, while the actual data is referred to as the payload. Because header information, or overhead data, is only used in the transmission process, it is stripped from the packet when it reaches its destination. Therefore, the payload is the only data received by the destination system.

Q:-5) What is the need of a Switch? (May 2012)

Ans:-5) A Switch is a computer networking device that links network segments or network devices. The term commonly refers to a multi-port network bridge that processes and routes data at the data link layer (layer 2) of the OSI model. Switches that additionally process data at the network layer (layer 3) and above are often called *layer-3 switches* or multilayer switches.

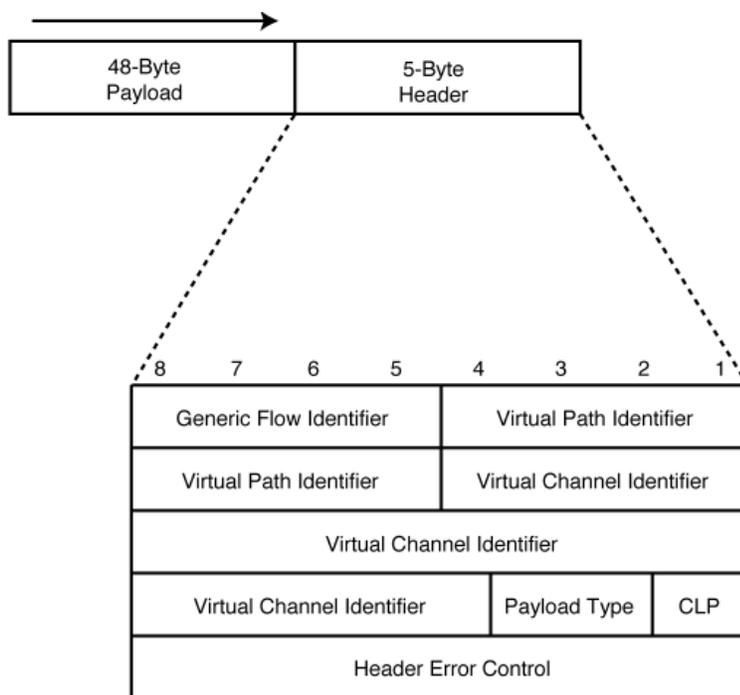
Q:-6) Define Frame? (May 2012)

Ans:-6) In telecommunications, a **frame** is data that is transmitted between network points as a unit complete with addressing and necessary protocol control information. A frame is usually transmitted serial bit by bit and

contains a header field and a trailer field that "frame" the data. (Some control frames contain no data.)

Q:-7) What is the Header Size in ATM Cell? (May 2012)

Ans:-7) Header Size in ATM Cell



CLP = Cell Loss Priority

Q:-8) What is a Permanent Virtual Circuit? (Dec. 2012)

Ans:-8) A Permanent Virtual Circuit is a networking technology that allows sharing of physical paths among multiple virtual circuits by establishing long-term logical connections and bandwidth allocations within

a frame relay network, which handles management of network traffic. Use of a Permanent Virtual Circuit reduces the need for frequent call set-up.

Q:-9) What is B-ISDN? (Dec. 2012)

Ans:-9) Broadband Integrated Services Digital Network (

BISDN is both a concept and a set of services and developing standards for integrating digital transmission services in a broadband network of fiber optic and radio media. BISDN will encompass *frame relay* service for high-speed data that can be sent in large bursts, the Fiber Distributed-Data Interface (Fiber Distributed-Data Interface), and the Synchronous Optical Network (Synchronous Optical Network). BISDN will support transmission from 2 Mbps up to much higher, but as yet unspecified, rates.

Q:-10) What is ATM Virtual Connection? (Dec. 2012)

Ans:-10) ATM VIRTUAL CONNECTIONS:

ATM networks are fundamentally connection-oriented, which means that a **virtual channel** (VC) must be set up across the ATM network prior to any data transfer. (A virtual channel is roughly equivalent to a virtual circuit.)

Two types of ATM connections exist: Virtual paths, which are identified by virtual path identifiers, and Virtual channels, which are identified by the combination of a VPI and a virtual channel identifier (VCI).

A virtual path is a bundle of virtual channels, all of which are switched transparently across the ATM network based on the common VPI. All VPIs and VCIs, however, have only local significance across a particular link and are remapped, as appropriate, at each switch. A transmission path is the physical media that transports virtual channels and virtual paths.

Q:-11) What is ATM Cell? (Dec. 2012)

Ans:-11) An **ATM cell** is 53 bytes long containing a 5 byte header and a 48 byte payload. The header of an ATM cell contains all necessary information for data to reach the appropriate end point. The payload portion of an ATM cell can contain any type of information, be it voice, video or data.

Q:-12) Whether ATM is Connection oriented or Connection less Protocol? Explain. (May 2011)

Ans:-12) ATM is a **Connection Oriented Technology**. ATM uses virtual connections to Switch cells from one node to another. Cells belonging to a virtual connection follow the same path. The bandwidth allocated to a virtual connection is assigned at the time of connection setup.

Q:-13) Write down the functions of AAL3 Layer? (May 2011)

Ans:-13) **AAL3 Layer** provides for Connectionless/Connection oriented, Time intensive, variable bit rate data transfer. Apart from the common functionality like segmentation and reassembly. AAL3 provides certain

enhanced functionality like multiplexing of multiple end to end data flows on a single virtual circuit.

Q:-14) Which type of transmission can be done in ATM networks?
(May 2011)

Ans:-14) ATM is a Transfer mode in which the information is organized into cells; It is asynchronous in the sense that the recurrence of cells containing information is not periodic. The type of transmission is Asynchronous.

Q:-15) What is the significance of ATM? (Dec. 2011)

Ans:-15) ATM Short for *Asynchronous Transfer Mode*, a network technology based on transferring data in *cells* or *packets* of a fixed size. The cell used with ATM is relatively small compared to units used with older technologies. The small, constant cell size allows ATM equipment to transmit video, audio, and computer data over the same network, and assure that no single type of data hogs the line.

Q:-16) What do you mean by Virtual Channel Identifier? (Dec. 2011)

Ans:-16) VCI Stands for "**Virtual Channel Identifier**". The VCI, used in conjunction with the VPI (virtual path indicator), indicates where an ATM cell is to travel over a network.

The VCI within each ATM cell defines the fixed channel on which the packet of information should be sent. It is a 16-bit field, compared to the VPI, which is only 8 bits. Since this numerical tag specifies the virtual channel that each packet belongs to, it prevents interference with other data being sent across the network.

Q:-17) Discuss an ATM Cable? (Dec. 2011)

Ans:-17) ATM Cables are required to carry cells from one user to another through various intermediate nodes present in the network.

Two types of cables are used by ATM Network:-

- Copper Cables
- Optical Cables

Q:-18) What do you mean by Virtual Path Identifier? (Dec. 2011)

Ans:-18) VPI Stands for "Virtual Path Identifier". The VPI is an 8-bit header inside each ATM cell that indicates where the cell should be routed.

As an ATM cell moves across a network, it typically passes through several ATM switches. The VPI tells the switches where to route the packet of information, or what path to take. The VPI is used in conjunction with the VCI, or virtual channel identifier.

Q:-19) What is Segmentation and Reassembly in ATM? (Dec. 2011)

Ans:-19) In a packet-switched telecommunication network, **segmentation and reassembly** (SAR, sometimes just referred to as *segmentation*) is the process of breaking a packet into smaller units before transmission and reassembling them into the proper order at the receiving end of the communication. Packets are made smaller to speed them through the network and specifically because of specified packet size restrictions in a given path. In the Open Systems Interconnection (OSI) model, SAR is performed in the Transport layer at both ends. A transport protocol determines the size of the smallest maximum protocol data unit (PDU) supported by any of the involved networks, and segments the packets accordingly.

SAR is used for **asynchronous transfer mode** (ATM) communications. In TCP/IP, the same process is known as fragmentation.

Q:-20) What is an Idle Cell? (Dec. 2011)

Ans:-20) The International Telecommunications Union (ITU-T) defines the format of unassigned and idle cells. The purpose of these cells is to ensure proper cell decoupling or cell delineation, which enables a receiving ATM interface to recognize the start of each new cell.

Q:-21) What is meant by QoS? (Dec. 2011)

Ans:-21) QoS Short for **Quality of Service**, a networking term that specifies a guaranteed throughput level. One of the biggest advantages of ATM over competing technologies such as Frame Relay and Fast Ethernet, is that it supports QoS levels. This allows ATM providers to guarantee to their customers that end-to-end latency will not exceed a specified level.

Q:-22) What is Cell Switching? (May 2010)

Ans:-22) Cell Switching operates in a similar way to packet switching but uses small fixed length cells for data transport. This technology is found within cell based integrated networks such as Asynchronous Transfer Mode (ATM) networks. Cell switching can handle multiple data types, i.e. voice, video and data

Cell switching is typically a high bandwidth and high speed (up to 155 Mbps) technology.

Cell switching is essentially an attempt to combine the best of circuit switching (guaranteed delivery) and packet switching (efficiency).

Q:-23) Write features of AAL 1 Layer? (May 2010)

Ans:-23) An **ATM Adaptation layer 1** or **AAL1** is used for transmitting Class A traffic, that is, real-time, constant bit rate, connection oriented traffic

(example- uncompressed audio and video). Bits are fed in by the application at constant rate and must be delivered to other end with minimum delay, jitter or overhead.

The input is stream of bits without message boundaries. For this traffic, error detection protocols cannot be used since timeouts and retransmission causes delay but the missing cells are reported to the application that must take its own action to recover from them.

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