

17IT3503 – Computer Networks

Unit-1 Important Questions

One Mark Questions

What is client –server model?

Define Ubiquitous computing

Define point-to-point and Broadcast Network

Classify networks based on scale

Define an Interface and protocol stack

List various Service primitives

Define Circuit switching and Packet switching

Difference between TDM and FDM

What are the principals that were applied to arrive at seven layers in OSI reference model

List the functions of Network layer

What are the 2 transport layer protocols in TCP/IP reference model

Differentiate OSI and TCP/IP reference models

Essay Questions

“Computer networks are useful for real time applications”, Justify.

An alternative to a LAN is timesharing system with terminals for all the users .Give two advantages of a client –server system using LAN

Classify the networks according to transmission technology and scale

Two networks each provide reliable connection oriented service .One of them offers a reliable byte stream and the other offers a reliable message stream .Are these identical? If so why is the distinction made? If not give an example of how they differ

Explain the design issues of the layers

Explain the scenario of circuit-switched network consisting of 4 switches and 4 links

Explain the scenario of packet switched network with an example

Explain the OSI reference model with an example for each layer

Explain the TCP/IP reference model by specifying the protocols used at each layer

Connection-Oriented Versus Connectionless Service

Placement Questions from Unit-1

Topic 1: Uses of Computer Networks

1. What Is Client/server?

Answer :Clients and Servers are separate logical entities that work together over a network to accomplish a task. Many systems with very different architectures that are connected together are also called Client/Server.

2. What Are The Characteristics Of Client/server?

Answer :

Service

Shared resources

Asymmetrical protocols

Transparency of location

Mix-and-match

Message based exchanges

Encapsulation of services

Scalability

Integrity

Client/Server computing is the ultimate "Open platform". It gives the freedom to mix-and-match components of almost any level. Clients and servers are loosely coupled systems that interact through a message-passing mechanism.

3 . What Are Major Types Of Networks And Explain?

Answer :

Server-based network,

Peer-to-peer network.

Peer-to-peer network, computers can act as both servers sharing resources and as clients using the resources.

Server-based networks provide centralized control of network resources and rely on server computers to provide security and network administration.

4. What is VoIP and how does it work?

VoIP is the technology that converts your voice into a digital signal, allowing you to make a call directly from a computer, a VoIP phone, or other data-driven devices. ... You may also hear it referred to as IP telephony, internet telephony, broadband telephony, or broadband phone service.

5. What is a peer-peer process?

The processes on each machine that communicate at a given layer are called peer-peer process.

6. What is a VPN?

VPN is the Virtual Private Network and is built on the Internet as a private wide area network. Internet-based VPNs are less expensive and can be connected from anywhere in the world.

VPNs are used to connect offices remotely and are less expensive when compared to WAN connections. VPNs are used for secure transactions and confidential data can be transferred between multiple offices. VPN keeps company information secure against any potential intrusion.

Topic 2: Network Hardware

1. What are the two types of transmission technology available?

Ans. The two types of transmission technology are – broadcast and point-to-point.

2. What is a 'subnet'?

Ans. A 'subnet' is a generic term for a section of a large network, usually separated by a bridge or a router.

3. What is a LAN?

Ans. LAN stands for Local Area Network and it refers to the connection between computers and other network devices, located in proximity to each other.

4. What are Nodes and Links?

Ans.

Nodes – Devices or data points on a larger network are known as nodes. They are individual parts of a larger data structure and contain data. They also link other nodes.

Links- A link is the physical and logical network component for interconnecting hosts or nodes in a network. It is a physical communication medium such as coaxial cable or optical fiber.

5. What is half-duplex?

It is the mode of communication between two devices. Here the data flows bi-directionally but simultaneously. A perfect example of a half-duplex is a walkie-talkie.

6. What is full-duplex?

This is also a mode of communication between two devices and the data flow is bi-directional too, but the flow is simultaneous. Example – telephone.

7. What is the difference between Communication and Transmission?

Transmission – A process of sending and receiving data between source and destination, in only one way. It is regarded as the physical movement of data.

Communication – A process of sending and receiving data between source and destination, in both ways.

8. Is there a difference between a gateway and a router?

A gateway sends the data between two dissimilar networks, while a router sends the data between two similar networks.

9. Explain various types of networks based on their sizes?

The size of the network is defined as the geographic area and the number of computers covered in it. Based on the size of the network they are classified as below:

Local Area Network (LAN): A network with a minimum of two computers to a maximum of thousands of computers within an office or a building is termed as LAN. Generally, it works for a single site where people can share resources like printers, data storage, etc.

Metropolitan Area Network (MAN): It is larger than LAN and used to connect various LANs across small regions, a city, campus of colleges or universities, etc which in turn forms a bigger network.

Wide Area Network (WAN): Multiple LANs and MAN's connected together form a WAN. It covers a wider area like a whole country or world.

Topic 3: Network Software

1. What are the key elements of the protocol?

Answer: There are three key elements of the protocol:

- Syntax: Describe the format of the data.
- Semantics: Describes the meaning of each section.
- Timings: Explain the timing that how fast the data can be sent.

2. What Is Point-to-point Protocol?

Answer : A communications protocol used to connect computers to remote networking services including Internet service providers.

3. Define Internetworking?

Answer: Internetworking is the practice of interconnecting multiple networks, such that any pair of hosts in the connected networks can exchange messages irrespective of their hardware-level networking technology. The resulting systems of interconnected networks are called an internetwork, or simply an internet.

4. What is flow Control?

Flow control refers to a set of procedures used to restrict the amount of data. The sender can

send before waiting for acknowledgment.

5. Define Error detection and correction.

Error Detection: Data can be corrupted during transmission. It is called as an error. For reliable communication, the receiver must find out the errors occurred in the data which is called as error detection.

Error Correction: It is the mechanism to correct the errors and it can be handled in 2 ways.

- a) When an error is discovered, the receiver can have the sender retransmit the entire data unit.
- b) A receiver can use an error correcting coder, which automatically corrects certain error

6. What is mean by error control?

Error control is a method that can be used to recover the corrupted data whenever possible.

These are two basic types of error control which are backward error control and forward error control

Topic 4: The Network Core

1. What are the difference between circuit switching and packet switching?

Circuit Switching is connection oriented that means a path is established between source and destination before the transmission occurs. On the other hand, Packet Switching is Connectionless that means a dynamic route is decided for each packet while transmission.

2. Why is switching required?

Switches connect these nodes to ensure seamless communication across devices which are not physically close or connected. This ability to quickly and accurately distribute the right information to the proper node so that it reaches the end user in a digestible way is why switching is so important.

3. What are the difference between circuit switching and packet switching?

Circuit Switching is connection oriented that means a path is established between source and destination before the transmission occurs.

Packet Switching is Connectionless that means a dynamic route is decided for each packet while transmission

4. Does circuit switching use packets?

Packet switching divides the data to be transmitted into packets transmitted through the network independently. ... Virtual circuits use packet switching technology that emulates circuit switching, in the sense that the connection is established before any packets are transferred, and packets are delivered in order.

5. What are the switching techniques?

There are mainly three typical Switching Techniques available for digital traffic: Circuit Switching. Message Switching. Packet Switching.

Advantages:

Packet switching is cost effective.

Offers improved delay characteristics.

Packet can be rerouted if any problem occurs.

Topic 5: Reference Models -The OSI reference model

1. What are the issues in data link layer?

The data link layer has a number of specific functions it can carry out. These functions include,

- Providing a well-defined service interface to the network layer.
- Dealing with transmission errors.
- Regulating the flow of data so that slow receivers are not swamped by fast senders

2. What are the responsibilities of data link layer?

Specific responsibilities of data link layer include the following.

- Framing
- Physical addressing
- Flow control
- Error control
- Access control

3. What is OSI?

A standard that specifies a conceptual model called Open systems Interconnection network

interface model, which breaks networked communications into seven layers: Application,

Presentation, Session, Transport, Network, Data link, Physical. 4. State the major functions performed by the presentation layer of the ISO OSI model.

Presentation layer is concerned with the format of data exchanged between peers, for example,

Whether an integer is 16, 32, or 64 bits long and whether the most significant bit is transmitted first or last, or how a video stream is formatted.

5. State the purpose of layering in networks?

- A layer is a collection of related functions that provides services to the layer above it and receives services from the layer below it.
- To execute the functions by each layer is independent

6. List the services of end to end services.

- Guarantee message delivery.
- Delivery messages in the same order they are sent.
- Deliver at most one copy of each message.
- Support arbitrarily large message.
- Support synchronization

7. What are the functions of transport layer?

- Breaks messages into packets.
- Connection control.
- Addressing.
- Provide reliability.

Topic 6: TCP/IP Reference model

1. What are TCP and UDP?

Common factors in TCP and UDP are:

TCP and UDP are the most widely used protocols that are built on the top of the IP protocol.

Both protocols TCP and UDP are used to send bits of data over the Internet, which is also known as 'packets'.

When packets are transferred using either TCP or UDP, it is sent to an IP address. These packets are traversed through routers to the destination.

2. Give a brief description of the TCP/ IP Model.

The TCP/ IP Model is a compressed version of the OSI Model. This Model contains 4 layers unlike the OSI Model which are:

- Process(Application Layer)
- Host-to-Host(Transport Layer)
- Internet Layer (Network Layer)
- Network Access(Combination of Physical and Data Link Layer)

3. What is the difference between the OSI Model and TCP/ IP Model?

| TCP/ IP Model | OSI Model |
|-----------------|------------------|
| Has four layers | Has seven layers |
| More reliable | Less reliable |

No strict boundaries Has strict boundaries

Horizontal Approach Vertical Approach

4. Give a brief explanation about UDP?

UDP or the User Datagram Protocol is used to create a low-latency and loss-tolerating communications between applications connected over the internet. UDP enables process-to-process communication and communicates via datagrams or messages.

5. Briefly explain what is ICMP?

ICMP stands for Internet Control Message Protocol and is a part of the Internet Protocol Suite. It is basically a supporting protocol to the Internet protocol and is used to send error messages and information regarding the success or failure of communication with another IP address. For example, if a service is not available an error is reported.