Computer Networks Interview Question

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1.Explain OSI Layer?

▪ Open system interconnect (OSI) was developed by the international organization for standardization (ISO) and introduced in 1984.

▪ It's a consists of seven layers

▪ Application layer, Presentation layer, Session layer, Transport layer, Network layer, Data link layer, Physical layer.

2.Which Layer is Responsible for Reliable Connection?

The transport layer guarantees a reliable end-to-end connection

3.What are Different protocol works at each of the Layer in OSI model?

Protocols at Each Layer of the OSI Model

1. **Application Layer**
    - **Function**: Provides an interface for the user to interact with application services or network services.
    - **Protocols**: HTTP, Telnet
2. **Presentation Layer**
    - **Function**: Defines a standard format for the data.
    - **Protocols**:
        - Encoding-Decoding: AVI (video), WAV (voice), JPEG (graphics), ASCII (text)
        - Encryption-Decryption
3. **Session Layer**
    - **Function**: Establishes, maintains, and terminates sessions.
    - **Protocols**: Remote Procedure Call (RPC), AppleTalk Session Protocol
4. **Transport Layer**
    - **Function**: Provides data delivery mechanisms between applications in the network.
    - **Protocols**: TCP, UDP
    - **Key Functions**:
        - Identifying service
        - Multiplexing & De-multiplexing
        - Segmentation, Error correction, Flow control
5. **Network Layer**
    - **Function**: Handles routing of data packets.

- **Protocols**: IP, ICMP, IGMP

6. **Data Link Layer**
   - **Function**: Provides node-to-node data transfer and error detection.
   - **Protocols**: Ethernet, PPP, Switches
7. **Physical Layer**
   - **Function**: Transmits raw bit stream over the physical medium.
   - **Protocols**: Ethernet (physical layer aspects), USB, Bluetooth

4 Difference Between TCP and UDP

Feature	**TCP (Transmission Control Protocol)**	**UDP (User Datagram Protocol)**
Connection Type	Connection-Oriented	Connectionless
Acknowledgements	Supports acknowledgements	No support for acknowledgements
Reliability	Reliable, ensures data delivery	Unreliable, no guarantee of delivery
Flow Control	Yes	No
Error Checking	Yes	Yes, but no recovery

5.What is the port number and give some example?

A port number is a way to identify a specific process to which an Internet or other network message is to be forwarded when it arrives at a server. For the Transmission Control Protocol and the User Datagram Protocol, a port number is a 16-bit integer that is put in the header appended to a message unit.

- FTP-File Transfer Protocol (TCP-20,21)
- SSH-Secure Shell SSH Secure Login (TCP-22)
- Telnetremote login service, unencrypted text messages (23)
- SMTP-Simple Mail Transfer Protocol E-mail routing (TCP-25)

- DNS-Domain Name System(TCP/UDP-53)
- DHCP-Dynamic Host Configuration Protocol IP-(67server)-68(client).
- HTTP-Hypertext Transfer Protocol (TCP-80) used in the World Wide Web (TCP-80)
- POP3-Post Office Protocol POP3 (TCP-110)
- NTP-Network Time Protocol (UDP-123)
- SNMP-Simple Network Management Protocol (UDP-161/162)
- HTTPS- Secure (HTTPS) HTTP over TLS/SSL(TCP-443)

8.What is the Unicast, Multicast and Broadcast?

Unicast In computer networking, unicast is a one-to-one transmission.

Multicast In computer networking, multicast is group communication.

Broadcast In computer networking, one-to-many

9.What is the different between Half-duplex and Full duplex?

Half Duplex-Data can flow in both direction but not simultaneously. At a time, Data can flow only in one directional Ex-HUB.

Full Duplex-Data can flow both directional simultaneously-Switch.

10.What is the MAC format?

It is a 12 Digits 48 Bit(6byte) Hardware address written in Hexadecimal format. It consists of two parts: -

- The first 24 Bits OUI (Organizationally Unique Identifier) is assigned by IEEE.
- The last 24 Bits is Manufacturing-assigned Code.

11.What are the protocols that are include by each layer of the TCP/IP model?

- Application layer-DNS, DHCP, FTP, TFTP, SMTP, HTTP,Telnet,SSH.
- Transport layer-TCP, UDP
- Internet layer-IP, ICMP, IGMP
- Network access layer-Ethernet, Token Ring, FDDI,X.25,Frame Relay,ARP,RARP.

12.What is the ARP?

Address Resolution Protocol (ARP) is a network protocol, which is used to map a network layer protocol address (IP address) to a data link layer hardware address (MAC address). ARP basically resolves IP address to the corresponding MAC address.

13.ARP work at Which layer and Why?

ARP work at the data link layer (layer 2) ARP Is implemented by the network protocol driver and its packets are encapsulated by ethernet headers and transmitted.

14.What is an ARP Table(cache)?

An ARP cache is a collection of Address Resolution Protocol entries (mostly dynamic) that are created when an IP address is resolved to a MAC address(so the computer can effectively communicate with the IP address)An ARP cache helps the attackers hide behind a fake IP address.

15.What is the size of an ARP request and ARP reply packet?

The size of an ARP request or reply packet is 28 bytes.

16.What is Proxy ARP?

Proxy ARP is the process in which one device responds to the ARP request for another devices. Ex- Host A send an ARP request to resolve the IP address of Host B. Instead of Host B, Host C responds to this ARP request.

17.What is Reverse ARP?

Reverse ARP is used to obtain the device's IP address when its MAC address is already known.

18.What is (Transmission Control Protocol) TCP?

It is one of the most used protocols within digital network communications and ensures end-to-end data delivery. TCP organizes data so that it can be transmitted between a server and a client. It guarantees the integrity of the data being communicated over a network.

19.Explain TCP Three-Way handshake process?

TCP 3-way handshake is a process which is used in a TCP/IP network to make a connection between the server and client. It is a three-step process that requires both the client and server to exchange synchronization and acknowledgment packets before the real data communication process starts.

20.What is the propose of RST bit?

When the connection is not allowed by destination connection is reset

21.What is the Fragmentation?

Fragmentation is a process of breaking the IP packet into smaller pieces (fragment). Fragmentation is required when the datagram is larger than the MTU. Each fragment then becomes a datagram and transmitted independently from source. These datagrams are reassembled by the destination.

22.What is the Routing?

The function of routing is to route packet between networks that are not locally attached.

23.What is the Router?

- It's is a device which enables communication between two or more different logical network.
- It's a network layer-3 device.

24.What are different modes in the router?

User mode: -

- Only some basic monitoring and limited show commands work in this mode.
- Ex-Enable, ping, traceroute, etc. Router>

Privilege mode: -

- Monitoring Troubleshooting and verification commands work in this mode.
- Ex-show, configure terminal, write, etc Router#

Global Configuration mode: -

- Global Configuration made in this mode affects the operation of the device.
- Ex-Hostname, etc. Router(config)#

25.What is the OSPF routing protocol?

Open Shortest Path First (OSPF) is a link-state routing protocol that is used to find the best path between the source and the destination router using its own Shortest Path First (SPF). OSPF is developed by Internet Engineering Task Force (IETF) as one of the Interior Gateway Protocol (IGP), i.e, the protocol which aims at moving the packet within a large autonomous system or routing domain. It is a network layer protocol which works on the protocol number 89 and uses AD value 110. OSPF uses multicast address 224.0.0.5 for normal communication and 224.0.0.6 for update to designated router (DR)/Backup Designated Router (BDR).