OSI MODEL CYBER SECURITY INTERVIEW QUESTIONS

1.What is the OSI model and why is it important?

Answer: The OSI (Open Systems Interconnection) model is a conceptual framework used to understand and standardize the functions of a telecommunication or computing system without regard to its underlying internal structure and technology. It is important because it helps network professionals troubleshoot network issues and understand how data travels from one device to another.

2.Can you list the seven layers of the OSI model?

Answer: The seven layers of the OSI model are:

Application Layer

Presentation Layer

Session Layer

Transport Layer

Network Layer

Data Link Layer

Physical Layer

Application Layer

3.What is the primary function of the application layer in the OSI model?

Answer: The application layer provides network services directly to end-user applications, facilitating communication between software applications and lower network layers.

4.Can you name some protocols that operate at the application layer?

Answer: Examples include HTTP, FTP, SMTP, and DNS.

5.How does the application layer handle network services?

Answer: The application layer handles network services by providing protocols that allow software to send and receive information, display data, and perform network tasks directly relevant to the end-user.

6.What is the role of the presentation layer in the OSI model?

Answer: The presentation layer translates data between the application layer and the network format. It handles data encryption, decryption, compression, and translation to ensure data is presented correctly.

7.How does the presentation layer ensure data is in a usable format?

Answer: The presentation layer ensures data is in a usable format by converting data from a machine-dependent format to a machine-independent format, and by handling data encryption and compression.

8.What is data encryption, and how is it handled at the presentation layer?

Answer: Data encryption is the process of converting data into a code to prevent unauthorized access. At the presentation layer, data is encrypted before transmission and decrypted upon reception to ensure secure communication.

9.What is the primary purpose of the session layer?

Answer: The session layer establishes, manages, and terminates sessions between applications. It coordinates communication between systems and maintains sessions for data exchange.

10.Can you give an example of a protocol that operates at the session layer?

Answer: An example is the Session Initiation Protocol (SIP), which is used for initiating, maintaining, and terminating real-time sessions that include voice, video, and messaging applications.

11.How does the session layer manage sessions?

Answer: The session layer manages sessions by establishing connections between applications, maintaining session state, and ensuring proper termination of sessions.

12.What are the main responsibilities of the transport layer?

Answer: The transport layer ensures reliable data transfer with error checking, flow control, and retransmission of lost packets. It manages end-to-end communication between devices.

13.Compare TCP and UDP.

Answer:

TCP (Transmission Control Protocol): Connection-oriented, provides reliable data transfer with error checking and flow control.

UDP (User Datagram Protocol): Connectionless, provides faster data transfer without error checking and flow control.

14.What is flow control and how is it managed at the transport layer?

Answer: Flow control is the process of managing the rate of data transmission between two nodes to prevent a fast sender from overwhelming a slow receiver. It is managed at the transport layer through mechanisms like windowing and buffering.

15.What function does the network layer perform?

Answer: The network layer is responsible for data routing, forwarding, addressing, and packet switching across networks. It determines the best path to send packets from source to destination.

16.What is the difference between IPv4 and IPv6?

Answer:

IPv4: 32-bit address space, limited to approximately 4.3 billion addresses.

IPv6: 128-bit address space, capable of providing a virtually unlimited number of addresses, improved security features, and simplified packet header.

17.How does the network layer determine the best path for data transmission?

Answer: The network layer determines the best path using routing algorithms and protocols, considering factors like distance, cost, and network congestion to ensure efficient data delivery.

18.What is the primary purpose of the data link layer?

Answer: The data link layer handles error detection and correction, framing of data, and manages access to the physical medium. It ensures that data is error-free and properly synchronized before passing it to the physical layer.

19.What is a MAC address and how is it used?

Answer: A MAC (Media Access Control) address is a unique identifier assigned to network interfaces for communications at the data link layer. It is used to ensure that data is delivered to the correct device on a local network.

20.Explain the difference between a switch and a hub.

Answer:

Switch: Operates at the data link layer, can filter and forward data to specific devices based on MAC addresses, reducing collisions and improving network efficiency.

Hub: Operates at the physical layer, broadcasts data to all devices in a network segment, leading to potential collisions and reduced efficiency.