ASSIGNMENT-2

1. Differentiate between client-server network and peer to peer network.

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| Client-Server Network | Peer to Peer Network |
| 1. In a client-server network, there is a central server that provides resources and services to multiple client computers. | 1. There is no centralized server; every node can share resources directly with other nodes. |
| 2. Centralized control: The server manages all resources and services, as well as network security and user access. | 2. Decentralized control: Each node independently manages its own resources and communications. |
| 3.It can be scaled by adding more servers or upgrading existing server capacity. | 3.P2P networks scale well with more nodes,as each new node can contribute resources. |
| 4.If server fails,clients may lose access to network resources,leading to a single point of failure. | 4.Higher resilience to failures:if one node fails,others can continue to function. |
| 5.This network is generally more secured because security policies are centralized. | 5.More challenging to secure because each node needs to be secured individually.Vulnerable to security risks. |

2.What are the seven layers of OSI model?What is the function of each layer?

* Open Systems Interconnection model is a conceptual framework used to understand and implement standardized communication between diverse systems.It divides communication process into seven distinct layers,each with specific functions.The seven layers of OSI model are as follows:
* **Physical Layer**: This layer deals with physical connection between devices which means they are responsible for the transmission and reception of raw bitstreams over a physical medium. Eg:cables,switches

Its key functions are: bit by bit data transmission,signal encoding and decoding.

* **Data Link Layer:** This layer provides node to node data transfer ie a link between two directly connected nodes.The data link layer divides the stream of bits received from the network layer into manageable data units called frames. MAC (Media Access Control) addressing is used to identify devices within a local network segment.
* **Network Layer:** The network layer is responsible for the source-to-destination delivery of a packet,possibly across multiple networks (links).Also its key function is logical addressing,packet forwarding and internetworking.
* **Transport Layer:** This ensures complete data transfer and reliability,manages end-to-end communication between devices and provides error checking and data flow control.
* **Session Layer:** The Session layer establishes, maintains, and synchronizes the interaction among communicating systems. The session layer allows a process to add checkpoints,synchronization points, to a stream of data.
* **Presentation Layer:**This layer translates data between the application layer and network format,ensures that data is in a usable format and is correctly encrypted/decrypted if necessary and handles data compression and decompression.
* **Application Layer:** It provides user interfaces and support for services such as electronic mail, remote file access and transfer, shared database management, and other types of distributed information services.

3.What are the principal behind OSI model?

* The OSI model is based on the following principle :

-A layer should be created where a different abstraction is needed.

- Each layer should perform a well-defined function.

- The function of each layer should be chosen with an eye toward defining internationally standardized protocols.

-The layer boundaries should be chosen to minimize the information flow across the interfaces.

-The number of layers should be large enough that distinct functions need not be thrown together in the same layer out of necessity and small enough that the architecture does not become unwieldy.

4. Differentiate between OSI reference model and TCP/IP reference model.

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| OSI reference model | TCP/IP reference model |
| 1.OSI model has seven layers. | 1.TCP/IP model has four layers |
| 2.OSI model is a theoretical framework designed to standardize networking protocols and to help diverse systems communicate with each other. | 2. The TCP/IP model is more practical and designed specifically for the suite of protocols used on the Internet. |
| 3. Each layer has a specific role and function, with a clear separation of concerns, allowing for detailed and precise protocol definitions. | 3.The layers in the TCP/IP model are less rigidly defined than in the OSI model, allowing for more flexibility in protocol implementation. |
| 4.It is used more as a reference model to understand and design network protocols.Actual implementation can vary. | 4.It is widely implemented and form the foundation of the Internet. |
| 5. The OSI model supports both connectionless and connection oriented communication in the  network layer, but only connection-oriented communication in the transport layer. | 5. The TCP/IP model supports only one mode in the network layer (connectionless) but both in  the transport layer, giving the users a choice. |

5. Simulate in packet tracer a ping request between two different networks.

* Check the .pkt file.