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# **Explain the OSI and TCP reference model?**

<https://www.studytonight.com/computer-networks/osi-model-physical-layer>

**Physical Layer**

* Physical layer is the lowest layer of the OSI reference model.
* It is responsible for transmit individual bits from one node to another over a physical medium.
* It transports data using eletrical, mechanical or procedural interface.

**Data Link Layer**

* It is responsible for the reliable transfer of data frames from one node to another connected by the physical layer.
* The main function of this layer is to make sure data transfer is error free from one node to another, over the physical layer.

**Network Layer**

* It manages the delivery of individual data packets from the source host to destination host.
* It acts as a network controller. It manages the Subnet traffic.
* It decides by which route data should take.

**Transport Layer**

* It is responsible for delivery of the entire message from the source host to destination host.
* One of the most common examples of this layer is TCP.

**Session Layer**

* The Session Layer allows users on different machines to establish active communication sessions between them.
* Its main aim is to establish, maintain and synchronize the interaction between communicating systems.

**Presentation Layer**

* The Presentation layer translates data for the application layer based on the syntax or semantics that the application accepts. Because of this, also called the syntax layer.

**Application layer**

* At this layer, both the end user and the application layer interact directly with the software application.

# **What is DNS and Its Working?**

<https://www.geeksforgeeks.org/working-of-domain-name-system-dns-server/>

<https://phoenixnap.com/kb/what-is-domain-name-system-works>

<https://www.liquidweb.com/kb/how-to-demystify-the-dns-process/>

<https://cloudacademy.com/blog/how-dns-works/>

## Type of DNS Records?

* **A**: A record stand for Address. It’s used to maps a domain name to the IP address (IPV4) of the hosting domain. It is a 32 bit internet address representing an ipv4 address.
* **AAAA**: It contain 128 bit Ipv6 address. Its used to maps a domain name to IP address (Ipv6) of the hosing domain.
* **CNAME**: can be used to alias one name to another. CNAME stands for Canonical Name.

A common example is when you have both example.com and [www.example.com](http://www.example.com/) pointing to the same application and hosted by the same server. To avoid maintaining two different records, it’s common to create:

An A record for example.com pointing to the server IP address

A CNAME record for [www.example.com](http://www.example.com/) pointing to example.com

* **Main exhanger (MX) Record:** specifies an SMTP email server for the domain, used to route outgoing emails to an email server.
* **Name Server (NS) Record:** [**https://www.cloudns.net/wiki/article/34/**](https://www.cloudns.net/wiki/article/34/)
* **PTR:** A PTR (pointer) record maps an IP address to the domain name. It’s often called a "reverse DNS entry" because it converts an IP address to a name.

<https://www.cloudns.net/wiki/article/40/>

* SOA : The [**DNS**](https://www.cloudflare.com/en-gb/learning/dns/what-is-dns)‘start of authority’ (SOA) record stores important information about a [**domain**](https://www.cloudflare.com/en-gb/learning/dns/glossary/what-is-a-domain-name)or [**zone**](https://www.cloudflare.com/en-gb/learning/dns/glossary/dns-zone)such as the email address of the administrator, when the domain was last updated, and how long the server should wait between refreshes.
* SRV : <https://www.pair.com/support/kb/what-is-an-srv-record/>
* TXT : <https://help.one.com/hc/en-us/articles/360000825478-How-do-I-create-a-TXT-record->

<https://www.name.com/support/articles/115004972547-Adding-a-TXT-Record>

* CAA: <https://support.dnsimple.com/articles/caa-record/>

## What is Nameserver?

<https://www.wpbeginner.com/glossary/dns/>

# **Computer Network and it types?**

## What is Network?

* A network is a set of devices that are connected with a physical media link. In a network, two or more nodes are connected by a physical link or two or more networks are connected by one or more nodes.
* A network is a collection of devices connected to each other to allow the sharing of data.
* Example of a network is an internet. An internet connects the millions of people across the world.

## What is Network Topology?

* Network Topology refers to the layout of a computer network. It shows how devices and cables are physically laid out, as well as how they connect.
* Network topology specifies the layout of a computer network. It shows how devices and cables are connected to each other.

## Key terms in Computer Network?

<https://www.studytonight.com/computer-networks/key-terms-computer-networks>

## What is Bandwidth?

Bandwidth is measured as the amount of data that can be transferred from one point to another within a network in a specific amount of time.

## What is Node?

A node refers to a device or point where a connection takes places. It can be a computer or device that is part of a network.

**What is Link?**  
A link refers to the connectivity between two devices. It includes the type of cables and protocols used for one device to be able to communicate with the other device.

## What are routers?

A router is a physical device which acts as a gateway and connects to two networks. It forwards the packets of data/information from one network to another. It acts as an interconnection Link between two networks.

## What is a point-to-point link?

It refers to a direct connection between two computers on a network. A pint to point connection does not need any other network devices other than connecting a cable to the NIC cards of both computers.

**What is Subnet mask?**

* A subnet mask is a 32 bits address used to distinguish between a network address and a host address in IP address. It identifies which part of an IP address is the network address and the host address.
* They are not show inside the data packets traversing the internet
* They carry the destination IP address, which a router will match with a subnet.

**Two type of subnet masks are:**

* The default Subnet Mask is the number of bits which is reserved by the address class. Using this default mask will accommodate a single network subnet in the relative class.
* A Custom Subnet Mask can be defined by an administrator to accommodate many Network

## How to Use a Subnet Mask?

## What is data encapsulation?

Data encapsulation is the process of breaking down information into smaller, manageable chunks before it is transmitted across the network. In this process that the source and destination addresses are attached to the headers, along with parity checks.

**What is VPN?**

VPN means Virtual Private Network, a technology that allows a secure tunnel to be created across a network such as the Internet. For example, VPNs allow you to establish a secure dial-up connection to a remote server.

## What is NAT?

NAT is Network Address Translation. This is a protocol that provides a way for multiple computers on a common network to share a single connection to the Internet.

## What is RIP?

RIP, short for Routing Information Protocol is used by routers to send data from one network to another. It efficiently manages routing data by broadcasting its routing table to all other routers within the network. It determines the network distance in units of hops.

## What are the different ways of securing a computer network?

There are several ways to do this:

* Install a reliable and updated anti-virus program on all computer.
* Make sure firewalls are setup and configured correctly.
* User authentication will also help a lot.

All these combined would make a hightly secured network.

## What is NIC?

NIC is short for Network Interface Card. This is a peripheral card that is attached to a PC in order to connect to a network. Every NIC has its own MAC address that identifies the PC on the network.

## **What are proxy servers, and how do they protect computer networks?**

[**https://www.varonis.com/blog/what-is-a-proxy-server/**](https://www.varonis.com/blog/what-is-a-proxy-server/)

## What is private IP address?

<https://www.geeksforgeeks.org/difference-between-private-and-public-ip-addresses/>

## What is NOC?

NOS, or Network Operating System, is specialized software. The main task of this software is to provide network connectivity to a computer in order to communicate with other computers and connected devices.

## What is DOS?

## What is MAC address?

MAC, or Media Access Control, uniquely identifies a device on the network. It is also known as a physical address or an Ethernet address. A MAC address is made up of 6-byte parts.

## What are firewalls?

Firewalls serve to protect an internal network from external attacks. These external threats can be hackers who want to steal data or computer viruses that can wipe out data in an instant. It also prevents other users from external networks from gaining access to the private network.

## What are gateways?

Gateways provide connectivity between two or more network segments. It is usually a computer that runs the gateway software and provides translation services. This translation is key in allowing different systems to communicate on the network.

## Give some examples of private network address?

10.0.0.0 with a subnet mask of 255.0.0.0

172.16.0.0 with subnet mask of 255.240.0.0

192.168.0.0 with subnet mask of 255.255.0.0

## What is Tracert?

Tracert is a Windows utility program that can use to trace the route taken by data from the router to the destination network. It also shows the number of hops taken during the entire transmission route.

## What is DHCP?

DHCP is short for Dynamic Host Configuration Protocol. Its main task is to assign an IP address to devices across the network automatically. It first checks for the next available address not yet taken by any device, then assigns this to a network device.

## What is TCP/IP?

TCP/IP is short for Transmission Control Protocol / Internet Protocol. This is a set of protocol layers that is designed to make data exchange possible on different types of computer networks, also known as a heterogeneous network.

## What is the main job of the ARP?

The main task of the ARP or Address Resolution Protocol is to map a known IP address to a MAC layer address.

## What is IMAP and POP3?

## What is anonymous FTP?

Anonymous FTP is a way of granting user access to files in public servers. Users that are allowed access to data in these servers do not need to identify themselves, but instead, log in as an anonymous guest.

## What is ICMP?

ICMP is an Internet Control Message Protocol. It provides messaging and communication for protocols within the TCP/IP stack. This is also the protocol that manages error messages that are used by network tools such as PING.

## What is ping?

Ping is a utility program that allows you to check connectivity between network devices on the network. You can ping a device by using its IP address or device name, such as a computer name.

## What is peer-to-peer?

Peer to peer (P2P) are networks that do not rely on a server. All PCs on this network act as individual workstations.

## What are advantages does fiber options have over other media?

One major advantage of fiber optics is that it is less susceptible to electrical interference. It also supports higher bandwidth, meaning more data can be transmitted and received. Signal degrading is also very minimal over long distances.

## Difference between hub and switch?

## What are the maximum networks and hosts in class A, B and C network?

## Describe networking?

Networking refers to the interconnection between computers and peripherals for data communication. Networking can be done using wired cabling or through a wireless link.

## What is SMTP?

SMTP is short for Simple Mail Transfer Protocol. This protocol deals with all internal mail and provides the necessary mail delivery services on the TCP/IP protocol stack.

## What is multicast routing?

Multicast routing is a targeted form of broadcasting that sends a message to a selected group of the user instead of sending it to all users on a subnet.

## What is the importance of encryption on a network?

Encryption is the process of translating information into a code that is unreadable by the user. It is then translated back or decrypted back to its normal readable format using a secret key or password. Encryption ensures that information that is intercepted halfway would remain unreadable because the user must have the correct password or key for it.

## What is meaning by tunnel mode?

This is a mode of data exchange wherein two communicating computers do not use IPsec themselves. Instead, the gateway that is connecting their LANs to the transit network creates a virtual tunnel. So, it uses the IPsec protocol to secure all communication that passes through it.

## What is the role of the IEEE in computing networking?

IEEE, or the Institute of Electrical and Electronics Engineers, is an organization composed of engineers that issues and manages standards for electrical and electronic devices. This includes networking devices, network interfaces, cablings, and connectors.

## What is VLAN?

## What is difference between TCP and UDP?

<https://www.journaldev.com/38467/difference-between-tcp-and-udp-protocols>

<http://www.steves-internet-guide.com/tcp-vs-udp/>

## What is IPv4 and Ipv6?

<https://www.guru99.com/difference-ipv4-vs-ipv6.html>

<https://www.geeksforgeeks.org/differences-between-ipv4-and-ipv6/>

## What is a Decoder?

The decoder is a type of circuit that converts the encoded data to its original format. It also converts the digital signal into an analog signal.

## Explain the term pipelining?

Pipelining describes the sequencing of processes. When any new task begins before an ongoing task is finished, it is called sequencing.

## Which measurement unit is used to measure the transmission speed of ethernet?

The transmission speed of Ethernet is mostly measured in Mbps.

## What is TCP Three-Way handshake?

## What is MAC address?

MAC address is a unique identifier that is assigned to a NIC (Network Interface Controller/ Card). It consists of a 48 bit or 64-bit address, which is associated with the network adapter. MAC address can be in hexadecimal format. The full form of MAC address is Media Access Control address.

## What is an Analog Signal and Digital Signal?

<https://www.guru99.com/networking-interview-questions.html>

## What is modem? What are the advantages?