**Quiz 3\_Ashish Raymonds**

**1. What is the Network ID, Broadcast Address, and first & last valid IP on the subnetwork that the host 192.168.1.15/26 belongs to?**

Ans: Network ID : 192.168.1

Broadcast Address : 192.168.1.63

First Usable IP : 192.168.1.1

Last Usable IP : 192.168.1.62

**2. What is the broadcast address of network 10.14.64.0/20?**

Ans: Broadcast Address: 10.14.79.255

**3. Which of the following is a valid IP host address given the network ID of 191.254.0.0 while using 11 bits for subnetting?**

a. 191.254.0.32

b. 191.254.0.96

c. 191.254.1.29

d. 191.54.1.64

**4. List the valid host range for subnet 192.168.15.48/28.**

Ans : No Of Usable Host :14

Range : 192.168.15.49 - 192.168.15.62

**5**. **What is DNS and explain it's usefulness.**

Ans : The domain name system (**DNS**) is the way that Internet domain names are located and translated into Internet Protocol addresses. A domain name is a meaningful and easy-to-remember "handle" for an Internet address.

DNS is like a phone book for the Internet. If you know a person’s name but don’t know their telephone number, you can simply look it up in a phone book. DNS provides this same service to the Internet.

**6. Explain the purpose of NS records and CNAME records in DNS?**

Ans:-

The **“NS”** record stands for “name server” and indicates which Name Server is authoritative for the domain.

The **“CNAME”** record stands for “canonical name” and serves to make one domain an alias of another domain. **CNAME** is often used to associate new subdomains with an existing domain's DNS records.

**7. Describe the purpose of load balancing and list out the load balancing algorithms.**

Ans: A **load balancer** is a device that acts as a reverse proxy and distributes network or application traffic across a number of servers. **Load** balancers are used to increase capacity (concurrent users) and reliability of applications.

**Load Balancing Algorithms:**

->**Round Robin** (sometimes called "Next in Loop").

->**Weighted Round Robin** -- as Round Robin, but some servers get a larger share of the overall traffic. Random.

->**Source IP hash**. Connections are distributed to backend servers based on the source IP address. If a web node fails and is taken out of service the distribution changes. As long as all servers are running a given client IP address will always go to the same web server.

->**URL hash.** Much like source IP hash, except hashing is done on the URL of the request. Useful when load balancing in front of proxy caches, as requests for a given object will always go to just one backend cache. This avoids cache duplication, having the same object stored in several / all caches, and increases effective capacity of the backend caches.

->**Least connections**, weighted least connections. The load balancer monitors the number of open connections for each server, and sends to the least busy server.

->**Least traffic**, weighted least traffic. The load balancer monitors the bitrate from each server, and sends to the server that has the least outgoing traffic.

->**Least latency**. Perlbal makes a quick HTTP OPTIONS request to backend servers, and sends the request to the first server to answer.

**8. List out the benefits of Proxy Server.**

Ans:

* The proxy server breaks the TCP/IP connection to hide your internal network information (such as internal host names and Internet Protocol (IP) addresses).
* You can set the proxy server to require user authentication before it accepts and forwards the user requests for services (TELNET only).
* The proxy server provides advanced logging capabilities so that you can record access information. Proxy server logging capabilities are superior to those of the SOCKS server because the proxy server provides the URL that the user accesses.
* Proxy servers help you control which services users can access. If you do not create a proxy for the service, users cannot access the service because each service must have its own proxy. (This is true as long as you do not allow access to the service through a SOCKS server or network address translation.)

These are some other benefits of proxy server.

1) Hidden IP Address

2) Reduction of Load

3) Control over Services

4) Security

5) Speedy Internet Access

**9. What is NAT and explain it's purpose**.

Ans : Network Address Translation (NAT) is an Internet standard that enables a local-area network (LAN) to use one set of IP addresses for internal traffic and a second set of addresses for external traffic. A NAT box located where the LAN meets the Internet makes all necessary IP address translations.

NAT serves three main purposes:

Provides a type of firewall by hiding internal IP addresses

Enables a company to use more internal IP addresses. Since they're used internally only, there's no possibility of conflict with IP addresses used by other companies and organizations.

Allows a company to combine multiple ISDN connections into a single Internet connection.

**10. Explain terms a) TLD b) FQDN c) sub domain in DNS**

Ans:

**Top-Level Domain(TLD)** - A top-level domain, or TLD, is the most general part of the domain. The top-level domain is the furthest portion to the right (as separated by a dot). Common top-level domains are "com", "net", "org", "gov", "edu", and "io".

Top-level domains are at the top of the hierarchy in terms of domain names.

**Fully Qualified Domain Name(FQDN)** - A fully qualified domain name, often called FQDN, is what we call an absolute domain name. Domains in the DNS system can be given relative to one another, and as such, can be somewhat ambiguous. A FQDN is an absolute name that specifies its location in relation to the absolute root of the domain name system.

This means that it specifies each parent domain including the TLD. A proper FQDN ends with a dot, indicating the root of the DNS hierarchy. An example of a FQDN is "mail.google.com.".

**SubDomain** - DNS works in a hierarchy. TLDs can have many domains under them. For instance, the "com" TLD has both "google.com" and "ubuntu.com" underneath it. A "subdomain" refers to any domain that is part of a larger domain. In this case, "ubuntu.com" can be said to be a subdomain of "com". This is typically just called the domain or the "ubuntu" portion is called a SLD, which means second level domain.

Likewise, each domain can control "subdomains" that are located under it. This is usually what we mean by subdomains. For instance you could have a subdomain for the history department of your school at "www.history.school.edu". The "history" portion is a subdomain.