WEEK 4

NETWORKING SERVICES

Why do we need DNS ?

DNS - **D**omain **N**ame **S**ystem , A global and highly distributed network service that resolves strings of letters into IP addresses for us. DNS can set the IP for the domain based upon region. DNS is the great example of application service that uses UDP for the transport layer instead of TCP.

Eg: If you search www.example.com from New york, the IP that is closer to New York is connected & responded. If you search www.example.com from Delhi, the IP that is closer to Delhi is connected & responded.

TTL(Time To Live)

A value, in seconds, that can be configured by the owner of a domain name for how long a name server can cache an entry before it should discard it and perform a full resolution again.

Simply DNS is a system that converts domain names into IP addresses. The process of changing domain name into an IP address is known as **name resolution**. When performing name resolution we need to configure some of the records.

- **A** - Record : It is used to point a certain domain name at a certain IPv4 IP address.
- **Quad A -** Record : It returns IPv6 IP addresses instead of IPv4 IP addresses.
- **CNAME -** Record : It is known as Canonical Name. It is used to redirect traffic from one domain name to another.
    - Eg : Some people might type microsoft.com alone instead of www.microsoft.com, By configuring a CNAME record for microsoft.com that resolves to www.microsoft.com
    - We can navigate to same for microsoft.com & www.microsoft.com in two ways,
        - Could set up identical **A - records** for both microsoft.com & www.microsoft.com . If we need to change IP in the sense we need to change in two places.
        - By setting up a **CNAME** that points microsoft.com to www.microsoft.com, you have to change the **A record** for www.microsoft.com only if IP changes.
- **MX** - Record (Mail Exchange) : This resource record is used in order to deliver email to the correct server.
- **SRV -** Record (Service Record) : It's used to define the location of various specific services. It is defined to return the specified of many different service types. Most SRV records are used which have a Calendar & Scheduling service.
- **TXT** - Record (Text Record) : Used for associating some descriptive text with a domain name for human consumption.

WEEK 4

NAT(Network Address Translation)

A technology that allows a gateway, usually a router or firewall to rewrite the source IP of an outgoing IP datagram while retaining the original IP in order to rewrite it into the response.

Hiding IP of computer 1 from computer 2 with NAT is known as ***IP Masquerading*.**

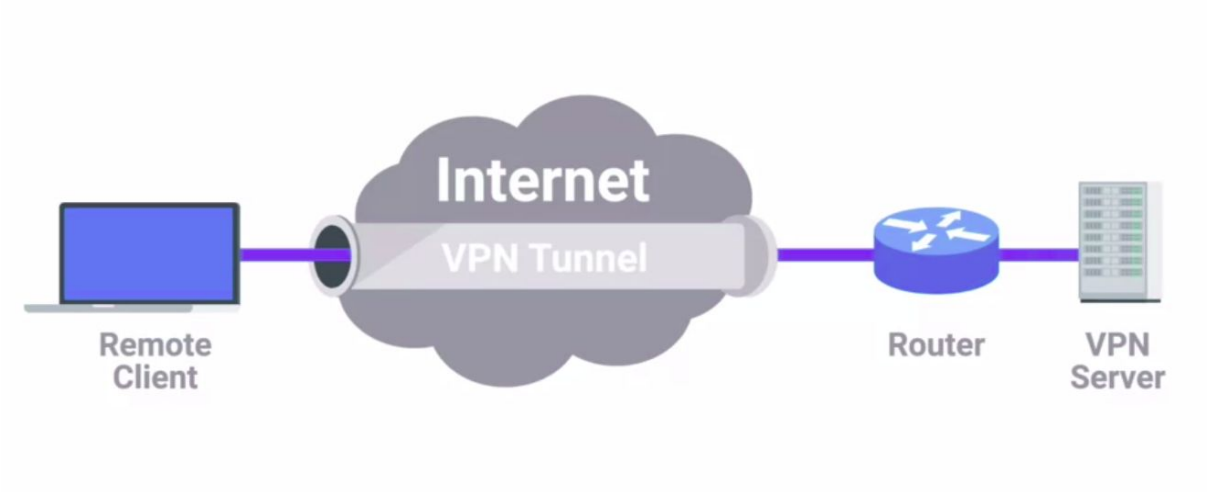
Port Preservation : A technique where the source port chosen by a client is the same port used by the router.

Port Forwarding : A technique where specific destination ports can be configured to always be delivered to specific nodes.

VPN's & Proxies

VPN - Virtual Private Network : One of the easiest ways to keep networks secure is to use various secure technologies, so only devices physically connected to their local area network can access these resources.But employees can run from any place, so that VPN comes into play.

A technology that allows for the extension of a private or local network to hosts that might not be on that local network. VPN is also known as Tunneling protocol, since it forms a tunnel between two devices.



In fact, ***Two factor authentication*** (A technique where more than just a username & password are required to authenticate) became common after the invention of VPN.

Proxy services :

A server that acts on behalf of a client in order to access another service.

The concept of a proxy is just that, a concept of an abstraction. In more words, Proxy sits between client & other services (i.e) similar to how gateway works.

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