DNS

=> DNS -> (Domain Name system) is like a phonebook for the internet.

=> DNS translate human-readable domain name like (xyz.com) into machine-readable IP addresses (192.0.2.1).

=> working of DNS

1) Domain Name Registration :- You register a domain name with a registrar.

2) DNS zone file :- The registrar creates a DNS zone file, which contains records mapping your domain name to IP addresses.

3) Name servers :- The zone file is hosted on name servers (usually provided by your registrar or DNS service)

4) Recursive Resolvers : when you enter a domain name in your browser, your device sends a query to a recursive resolver (usually provided by your ISP or operating system)

5) Query Process :- Recursive resolver sends the query to a root name server.
   - Root name server directs the query to a top-level domain (TLD) name server (like .com)
   - TLD name server directs the query to the authoritative name server for your domain
   - Authoritative name server returns the IP address associated with your domain name.

6) IP Address Returned :- The recursive resolver receives the Ip address and returns it to your device.

7) Connection Established :- your device connects

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to the IP address, loading the website or online service.

=> DNS Record Types

① A Record :- maps a domain name to an IP address

② CNAME Record :- maps an alias (subdomain) to the main domain name.

③ MX Record :- Routes email to a mail server.

④ NS Record :- Identifies name servers responsible for a domain

⑤ PTR Record :- maps an IP address to a domain name (reverse look up).

=> DNS Security

① DNSSEC :- Adds digital signatures to DNS records for authentication and integrity.

② DNS over TLS / HTTPS :- Encrypts DNS queries for privacy and security

=> DNS Best Practices

i) Use reputable DNS services.

ii) Configure DNSSEC

iii) Monitor DNS performance.

iv) Regularly update DNS records.