Experiment No. 11: DNS Lookup

AIM AND OBJECTIVE

Aim (Problem Definition): To write a program for DNS lookup, where given an IP address input, it should return the URL and vice versa.

Objective (Learning Objective): To understand what is Domain Name System and the process of DNS lookup. To understand DNS Structure and Hierarchy.

ORAL/VIVA IMPORTANT TOPICS

- Need for DNS (mapping names to addresses).
- The structure of the Domain Name Space (Hierarchical/Inverted Tree).
- Types of DNS Mapping: Forward Mapping and Reverse Mapping.
- The role of the Resolver.
- The concept of a Root Server, Top-Level Domain (TLD) server, and Authoritative server.

IMPORTANT QUESTIONS AND ANSWERS (Q&A)

Q1: Why is DNS needed? A: TCP/IP protocols use IP addresses (numbers) to identify hosts, but humans find it difficult to remember numbers. DNS is a system that allows users to use names (Domain Names/URLs) which are then automatically translated or mapped to their unique IP addresses.

Q2: What is DNS Resolution? A: DNS Resolution is the process of translating a domain name (like www.example.com) into its corresponding IP address, which the network protocols need for communication. The reverse process (IP to Name) is also part of resolution.

Q3: What is the difference between Forward and Reverse Mapping? A:

- Forward Mapping: Maps a Domain Name (Host Name) to an IP Address. This is the standard, most common lookup (e.g., typing a website address).
- Reverse Mapping: Maps an IP Address back to its corresponding Domain Name. This is often used for security logging, spam filtering, and server verification.

Q4: What is the purpose of a Resolver? A: A Resolver is a DNS client program that typically runs on the user's host. When an application needs to map a name to an address, it sends a query to the Resolver, which then handles the process of querying DNS servers to get the required mapping (IP address).