

**Practical No. 11**

**Aim:** Write a program for DNS Lookup given an IP address Input , it should return URL and Vice Versa.

**Objectives:**

1. To Learn the Basic concepts of Domain Name System.
2. To Learn DNS to IP mapping and IP to DNS Mapping.

**Theory:**

The **Domain Name System (DNS)** is a hierarchical decentralized naming system for computers, services, or other resources connected to the Internet or a private network. It associates various information with domain names assigned to each of the participating entities. Most prominently, it translates more readily memorized domain names to the numerical IP addresses needed for locating and identifying computer services and devices with the underlying network protocols. By providing a worldwide, distributed directory service, the Domain Name System is an essential component of the functionality on the Internet, that has been in use since 1985.

The Domain Name System delegates the responsibility of assigning domain names and mapping those names to Internet resources by designating authoritative name servers for each domain. Network administrators may delegate authority over sub- domains of their allocated name space to other name servers. This mechanism provides distributed and fault tolerant service and was designed to avoid a single large central database.

The Domain Name System also specifies the technical functionality of the database service that is at its core. It defines the DNS protocol, a detailed specification of the data structures and data communication exchanges used in the DNS, as part of the Internet Protocol Suite. Historically, other directory services preceding DNS were not scalable to large or global directories as they were originally based on text files, prominently the HOSTS.TXT resolver.

The Internet maintains two principal namespaces, the domain name hierarchy[1] and the Internet Protocol (IP) address spaces.[2] The Domain

Name System maintains the domain name hierarchy and provides translation services between it and the address spaces. Internet name servers and a communication protocol implement the Domain Name System.[3] A DNS name server is a server that stores the DNS records for a domain; a DNS name server responds with answers to queries against its database.

The most common types of records stored in the DNS database are for Start of Authority (SOA), IP addresses (A and AAAA), SMTP mail exchangers (MX), name servers (NS), pointers for reverse DNS lookups (PTR), and domain name aliases (CNAME). Although not intended to be a general purpose database, DNS can store records for other types of data for either automatic lookups, such as DNSSEC records, or for human queries such as *responsible person* (RP) records. As a general purpose database, the DNS has also been used in combating unsolicited email (spam) by storing a real-time blackhole list. The DNS database is traditionally stored in a structured zone file.

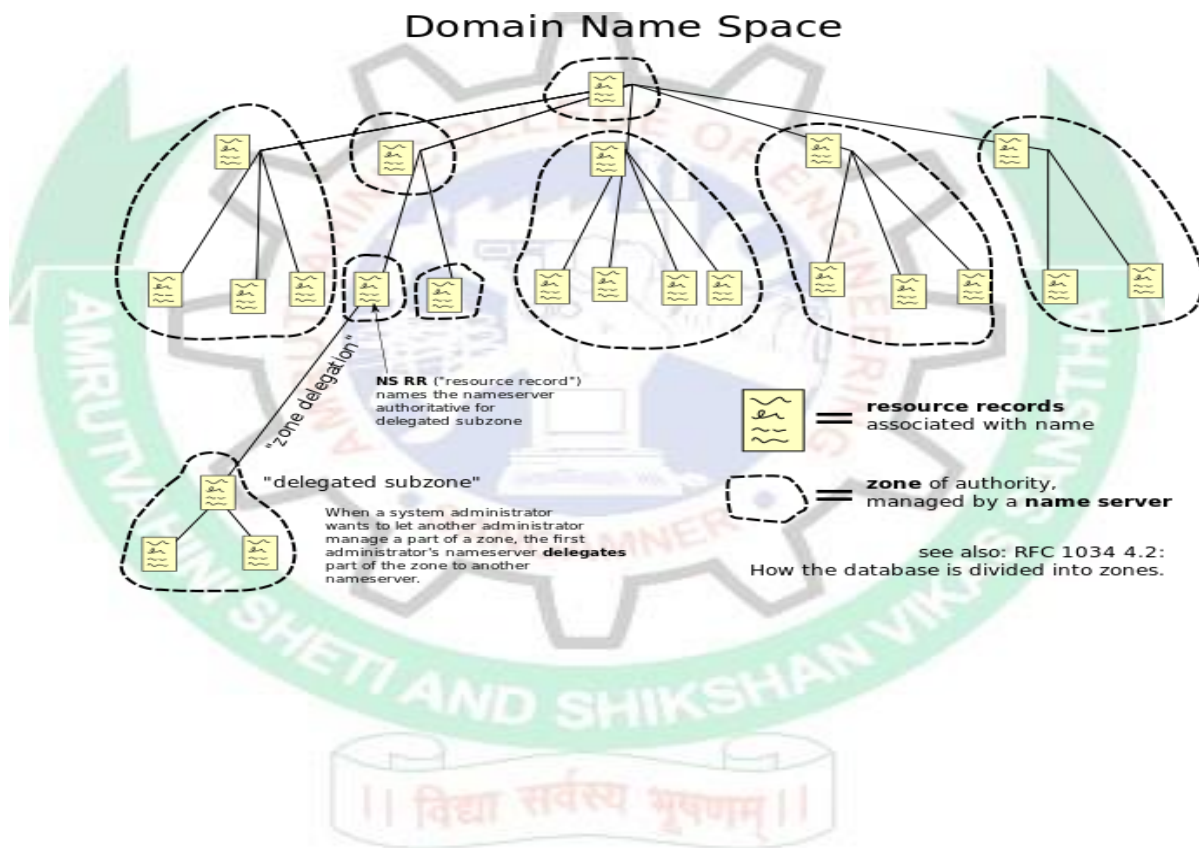


Fig 1:- The hierarchical Domain Name System for class *Internet*, organized into zones, each served by a name server

**Working of DNS:**

DNS servers answer questions from both inside and outside their own domains. When a server receives a request from outside the domain for information about a

name or address inside the domain, it provides the authoritative answer. When a server receives a request from inside its own domain for information about a name or address outside that domain, it passes the request out to another server -- usually one managed by its internet service provider. If that server does not know the answer or the authoritative source for the answer, it will reach out to the DNS servers for the top-level domain -- e.g., for all of .com or .edu. Then, it will pass the request down to the authoritative server for the specific domain -- e.g., techtarget.com or stkate.edu; the answer flows back along the same path.

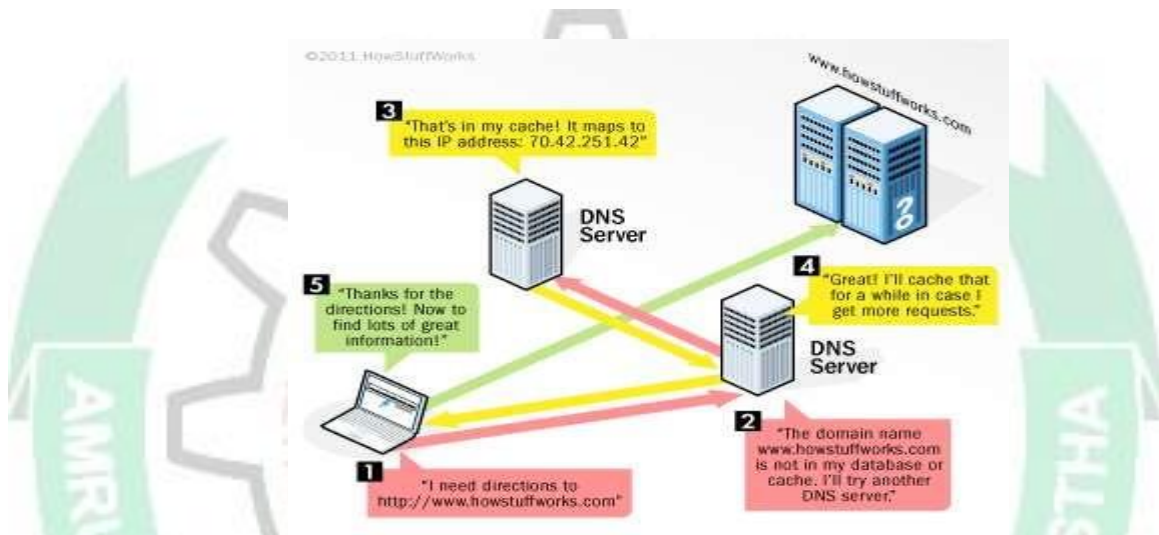
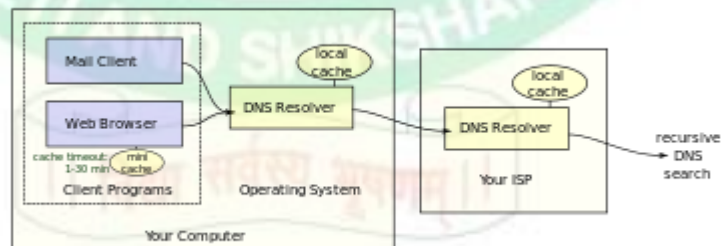


Fig 2: When you enter a URL into your Web browser, your DNS server uses its resources to resolve the name into the IP address for the appropriate Web server.

Fig 3: DNS resolution sequence



### Algorithm:

- 1) Start
- 2) Enter URL
- 3) Generate IP address from URL
- 4) Display IP address.
- 5) Enter IP Address

6) Generate URL from IP Address.

7) Display URL.

8) Stop.

**Conclusion:** Hence we conclude that we have lookup the URL which we want to visit the request is travels to local router to DNS server and it resolve the query as possible otherwise it forwards the query to next DNS hop.

**Signature with date**