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# Assignment No - 9 (C1)

DOS :- 03-12-2021

## Problem statement :-

Write a program for DNS lookup. Given an IP address as input, it should return URL and vice-versa -

## Prerequisite :-

Application layer : Roles, protocols.
Socket programming.

## Objectives :-

(i) To understand working of DNS protocol -

## Learning Outcomes :-

After completion of the assignment, students will be able to :
(i) Understand working of DNS protocol.
(ii) Implement program for DNS lookup.

## THEORY :-

## DNS :-

Domain Name system is the default name resolution service used in Microsoft Windows server 2003 network.

DNS is part of the Windows server 2003 TCP/IP protocol and all TCP/IP network connections are by default configured with the IP address of at least one DNS server in order to perform name resolution on the network.

## DNS Architecture -

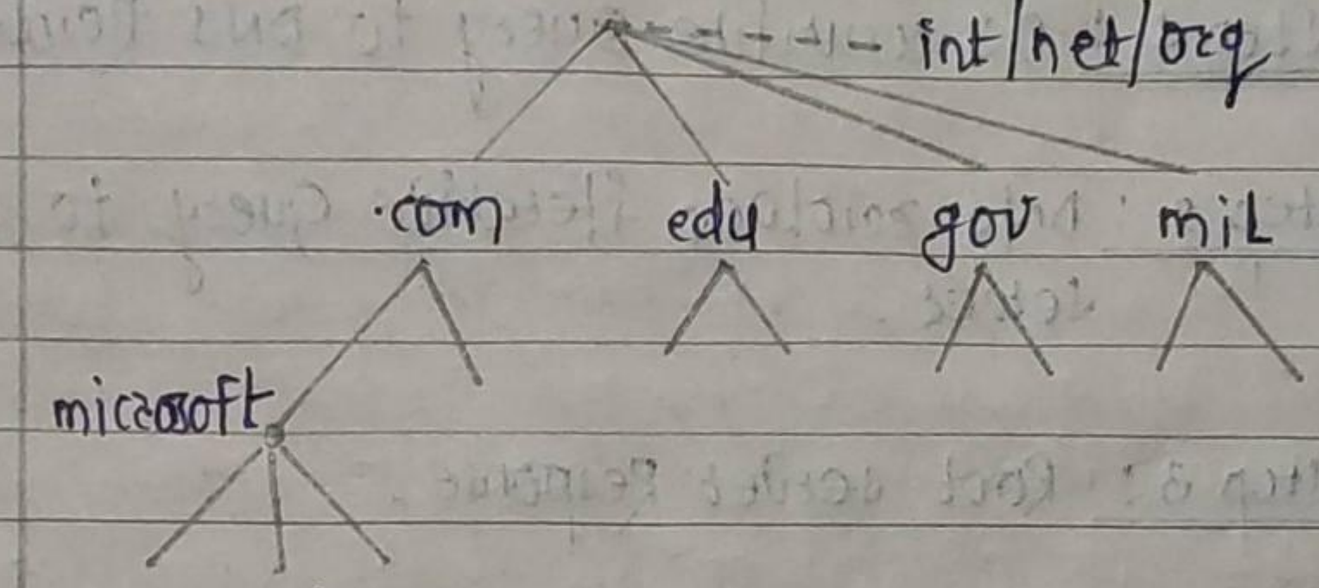
A hierarchical distributed database and an associated set of protocols that define
- A mechanism for querying and updating the database
- A mechanism for replicating the information in the database among servers
- A scheme of the database.

## DNS Domain Names :-

DNS is implemented as a hierarchical and distributed db containing various types of data, including host and domain names.

The names in a DNS db form a hierarchical tree structure called the domain namespace. Domain names consist of individual labels separated by dots, for example :- mydomain.microsoft.com

Managed by Registration Authority

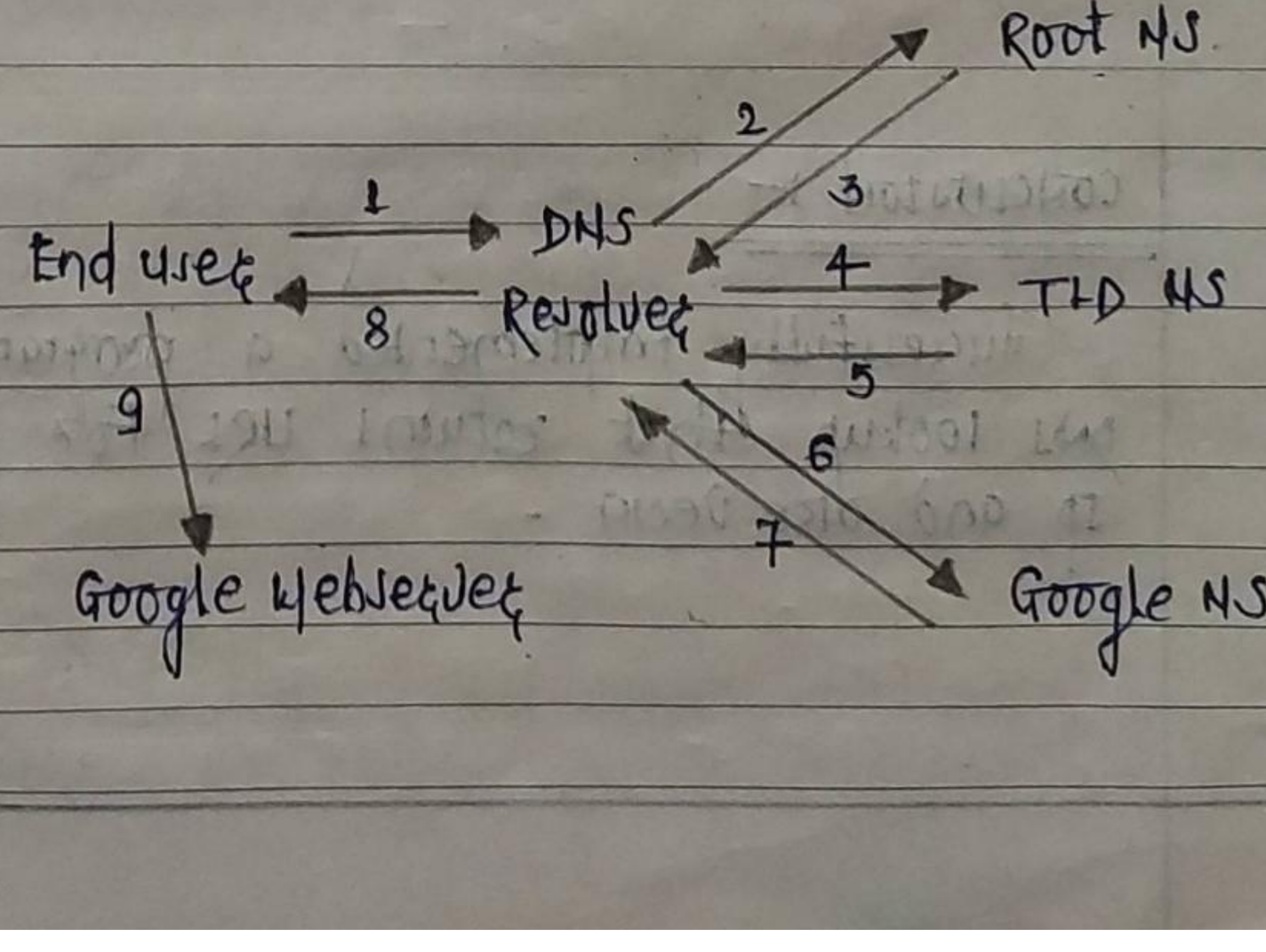



Managed by Microsoft

Types of DNS Domain Name :- Root ; Top level ; Second level ; subdomain ; Host or resource name.

## Working of DNS Lookup :-

DNS translates your familiar domain name (www.google.com) into an IP address your browser can (173.194.33.174).



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ALGORITHM :-

Step 1 : OS recursive Query to DNS Resolver.

Step 2 : DNS resolver iterative Query to Root server.

Step 3 : Root server Response.

Step 4 : DNS resolver iterative query to TLD server.

Step 5 : TLD servers response.

Step 6 : DNS resolver iterative query to google.com NS

Step 7 : google.com NS Response.

Step 8 : DNS resolver response to OS.

Step 9 : Browser starts TCP handshake.

CONCLUSION :-

Successfully implemented a program for DNS lookup that returns URL for given IP and vice-versa.

## CODE :-

```
package DNS;

import java.net.*;
import java.util.*;

public class DNS_LOOKUP
{
   public static void main(String[] args)
   {
      String host;
      Scanner ch = new Scanner(System.in);
      System.out.print("1.Enter Host Name \n2.Enter IP address \nChoice=");
      int choice = ch.nextInt();
      if(choice==1)
      {
         Scanner input = new Scanner(System.in);
         System.out.print("\n Enter host name: ");
         host = input.nextLine();
         try
         {
            InetAddress address = InetAddress.getByName(host);
            System.out.println("IP address: " + address.getHostAddress());
            System.out.println("Host name : " + address.getHostName());
            System.out.println("Host name and IP address: " + address.toString());
         }
         catch (UnknownHostException ex)
         {
            System.out.println("Could not find " + host);
         }
      }
      else
      {
         Scanner input = new Scanner(System.in);
         System.out.print("\n Enter IP address: ");
         host = input.nextLine();
         try
         {
            InetAddress address = InetAddress.getByName(host);
            System.out.println("Host name : " + address.getHostName());
            System.out.println("IP address: " + address.getHostAddress());
            System.out.println("Host name and IP address: " + address.toString());
         }
            catch (UnknownHostException ex)
            {
               System.out.println("Could not find " + host);
            }
         }
      }
   }
}
```

## OUTPUT :-

```
1.Enter Host Name
2.Enter IP address
Choice=1

 Enter host name: www.google.com
IP address: 216.58.203.4
Host name : www.google.com
Host name and IP address: www.google.com/216.58.203.4

1.Enter Host Name
2.Enter IP address
Choice=2

 Enter IP address: 8.8.8.8
Host name : dns.google
IP address: 8.8.8.8
Host name and IP address: dns.google/8.8.8.8
```