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Assignment - 08

* Title: Study of DNS Lookup.

* Problem Statement: Write a program for DNS lookup. Given an IP address input, it should return URL & viceversa

* Objectives:
  1. To learn & understand DNS lookup
  2. To learn & understand concept of IP protocol.

* Theory:

The Domain Name System (DNS) is phonebook of the Internet. Humans access information online through domain names, like nytimes.com or esp.com. DNS translates domain names to IP addresses so browsers can load Internet resource.

DNS servers eliminate the need for humans to memorize IP addresses such as 192.168.1.1 (in IPv4) or more complex IP addresses such as 2400:cb00:2048:1::c629:d7a2 (in IPv6)

The Windows server 2003 DNS server & client services use DNS protocol that is included in TCP/IP protocol suite. DNS is a part of application layer of TCP/IP reference model.

TCP/IP Model

Application layer
Transport layer
Internet layer
Network Interface Layer

TCP/IP Protocol suite

Telnet	FTP	SMTP	DNS	RIP	SNMP
TCP			UDP		
IP sec				ICMP	IGMP
IP					
Ethernet	Token Ring		Frame Relay		ATM

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Technologies That Use DNS:

- DNS & Active Directory

Windows Server 2003 Active Directory Service uses DNS as its domain controller location mechanism. When any of the principal Active Directory operations is performed, such as authentication, updating, or searching, Windows Server 2003 computers use DNS to locate Active Directory Domain controllers and these controller use DNS to locate each other.

- DNS & WINS:

The earlier method of name resolution for a Windows network was Windows Internet Name Service (WINS). DNS is different than WINS such as DNS is a hierarchical namespace & WINS is a flat namespace.

- DNS & DHCP:

For Windows Server 2003 DNS, DHCP service provides dynamic name resolution service support to register & update information for legacy DHCP clients in DNS zones, legacy clients typically include other Microsoft TCP/IP client computers that were released prior to Windows 2000.

DNS is dynamic name resolution service used in a Microsoft Windows server 2003 network. DNS is a part of windows server 2003 network. TCP/IP protocol suite and all TCP/IP network connections are, by dynamic, configured with IP address of at least one DNS server in order to perform name resolution on the network.

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- DNS Architecture:

It is a hierarchical distributed database & an associated set of protocols that define:

- A mechanism for querying & updating the database.
- A mechanism for replicating the info in the database among servers.
- A schema of database

- DNS Domain Names:

It is implemented is a hierarchical & distributed database containing various types of data, including that host names & domain names. The names in a DNS database form a hierarchical tree structure called domain namespace.

A fully qualified Domain Name (FQDN) uniquely identifies the hosts position within the DNS hierarchical tree by specifying a list of names separated by dots in the path from the referenced host to root.

- Understanding DNS Domain Namespace:

The DNS Domain namespace, is based on concept of a tree of concept of named domains. Each level of tree can represent either a branch or leaf of tree. A branch is level of where more than one name is used to identify a collection of named resources. A leaf represents a single named used once at that level to indicate a specific resource.

- DNS Domain Name Hierarchy:

Figure below shows how microsoft is assigned authority by internet root servers for its own part of DNS domain namespace tree on Internet. DNS clients & server use queries as fundamenta

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DNS method of resolving names is tree to specific types of resource information.

The DNS information is provided by DNS server in a query response to client, who then extract information & pass it to requesting program for resolving queried name.

- Types of DNS Domain Name:

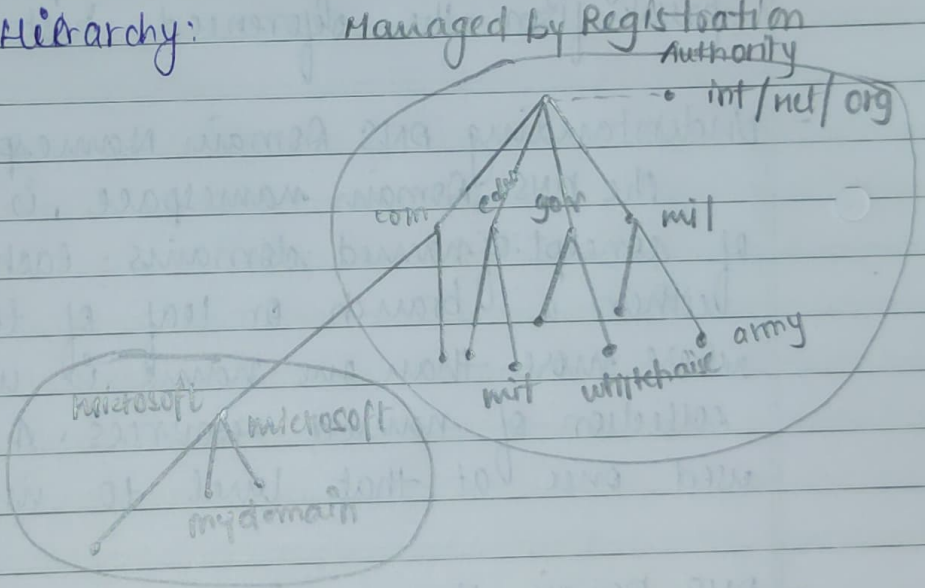
i) Root Domain: This is top of tree, representing unnamed level, indicating a null value by "".

ii) Top level Domain: A name used to indicate a country / region or type of organization using a name.

iii) Second level domain: Variable length names registered to an individual or organization for use on Internet.

iv) Subdomain: Additional names that an organization can create that are derived from registered second-level domain name.

DNS Domain Name Hierarchy:



* Conclusion: We successfully learned about DNS and executed program.

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