Assignment - 8

Title: DNS Lookup

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

Objectives:
To learn how DNS works and is used in the modern internet.

Outcomes:
Students will be able to return a URL from an IP address and vice versa.

Requirements:
Fedora 20, monitor, keyboard, Eclipse IDE

Theory:
- The Domain Name System is the full form of DNS. The mechanism by which internet software translates names to attributes such as addresses is DNS.
- It is a globally, distributed, scalable, reliable, database comprised of three components.

A "namespace" server makes that name space addresable. Resolves the servers about the namespace.

DNS as lookup mechanis:
Users generally prefer names to number. Computers prefer number to names. DNS provides the mapping between the 2.

DNS as Database
Keys to the database are "domain names", eg. www.google.come. Over 200,000,000 domain names are stored. Each domain name contains one or more attributes, known as "resource records".

Global Distribution:
Data is maintained locally, but retrievable globally. No single computer has all DNS data. DNS lookups can be performed by any device. Remote DNS data is locally cachable to improve performance

How does DNS work?
DNS servers answer questions from both inside and outside their own domains.

When a server recieves a request from outside the domain for information about a name or address inside the domain, it provides the answer.

It passes the request out to another server, usually one managed by its ISP.

If that server does not know the answer or the source for the answer, it will reach to the DNS servers for top level domain.
eg. .com, .edu

Then it will pass the request down to authoritative server for the specific domain eg. google.com. The answer flows ~~along~~ back along the same path.

DNS Message Format:

- The DNS protocol uses 2 types of DNS messages - queries & replies and both have same format.
- Each message consists of a header and 4 sections: questions, answers, authority and an additional space.

Some generic domains:

aero - aerospace & airlines
biz - buisness
com - commercial organisation
edu - educational
gov - government
mil - military
name - personal name

Conclusion:
Thus we have successfully implemented DNS lookup and understood how DNS works.