Domain Name System

By

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DNS – History

- ✓ Name anything in Internet
- ✓ We prefer Names
- ✓ Computer prefers IP addresses
- ✓ Mapping a Name to its IP Address – Look up

DNS – History

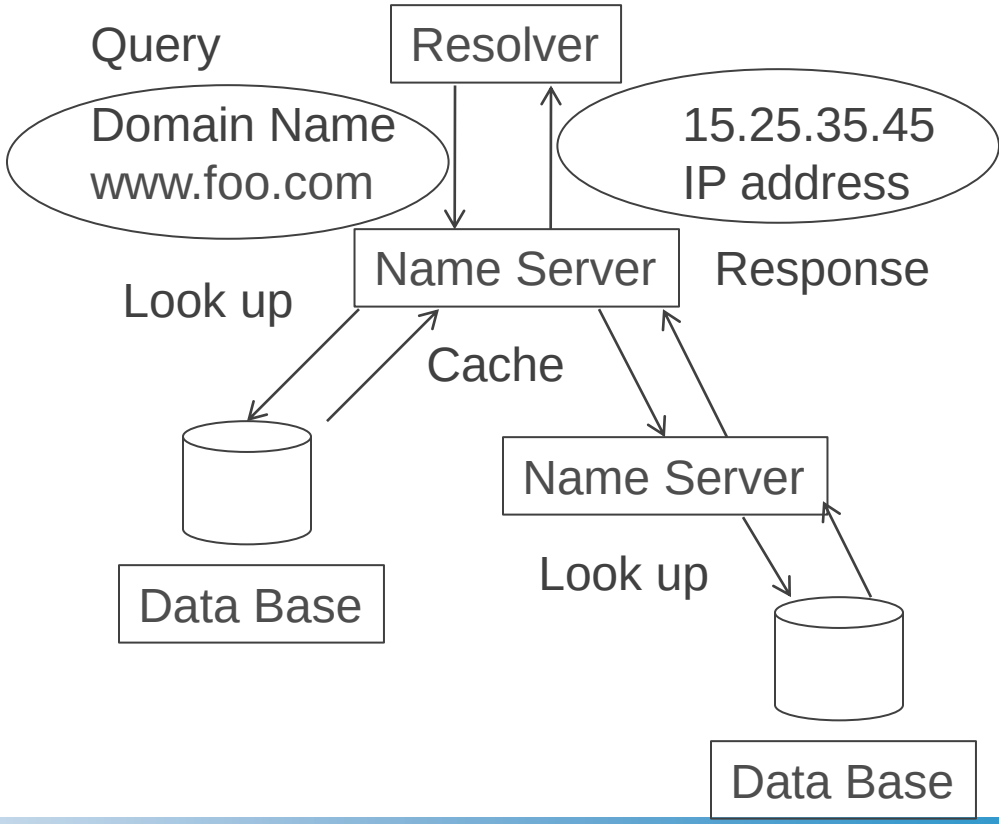
- ✓ ARPANET: Uses HOSTS.TXT
- ✓ HOSTS.TXT: Contains Names and Addresses
- ✓ Maintained and Updated: SRI's NIC (Stanford-Research-Institute: Network-Information-Center)
- ✓ Administrators FTP (download) HOSTS.TXT
- ✓ Problems: Traffic and load, Name collisions, Consistency

DNS – Domain Name System

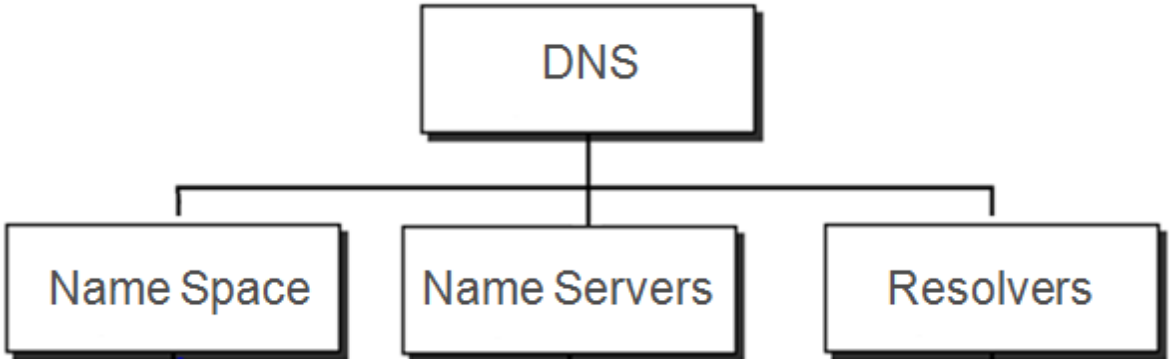
- ✓ Solution: Domain Name System
- ✓ A globally Distributed, Scalable, Reliable database

DNS – Overview

- ✓ Input: Domain Name
- ✓ Process: Fetch IP address
- ✓ Output: IP address
- ✓ Not a Single Name Server



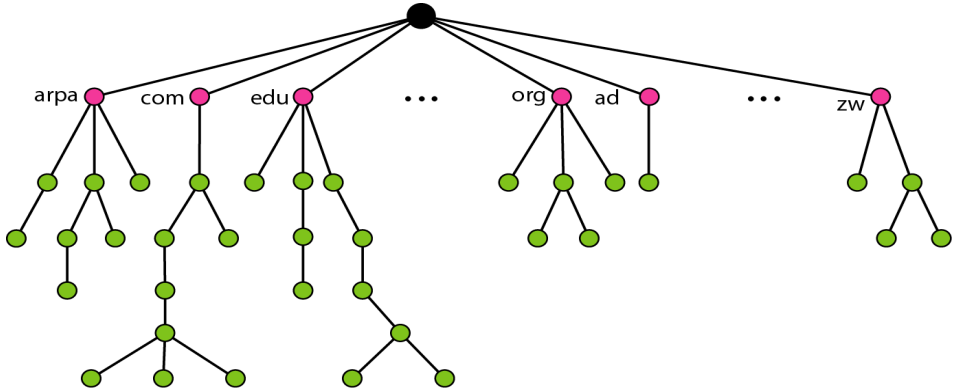
DNS – Components



- ✓ Name Space is the structure of the DNS database
- ✓ Name Servers: Makes the Name Space available
- ✓ Resolvers: Query the servers about the Name Space

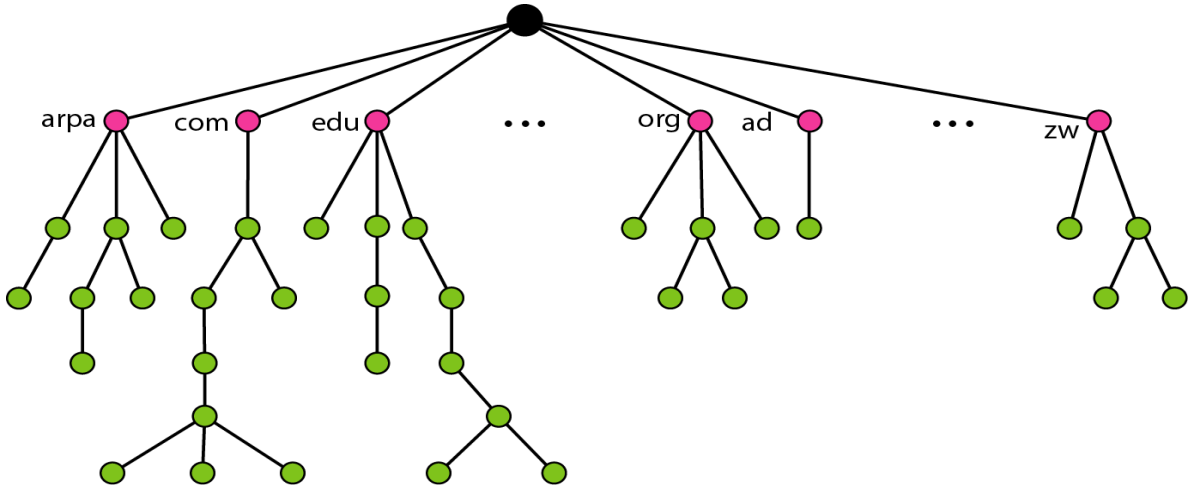
DNS – Name Space

Root Level 0 – Maintained by ITU



- ✓ Name Space: Structure of the DNS database - 200,000,000 Names
- ✓ Name Space is inverted tree with the root node at the top
- ✓ Each node has a Label - The root node has a null Label
- ✓ Maximum Depth: 127 Levels

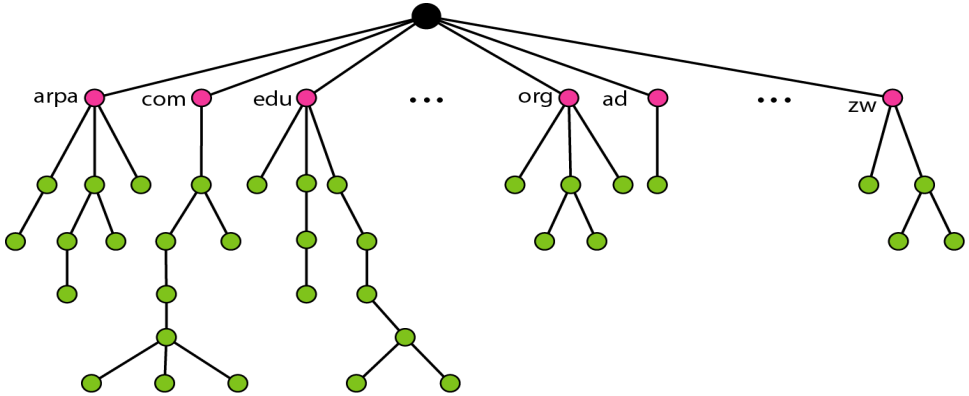
DNS – Label



Label
com

- ✓ String of 63 bytes
- ✓ RFCs 852 and 1123: Specifications for Host Names

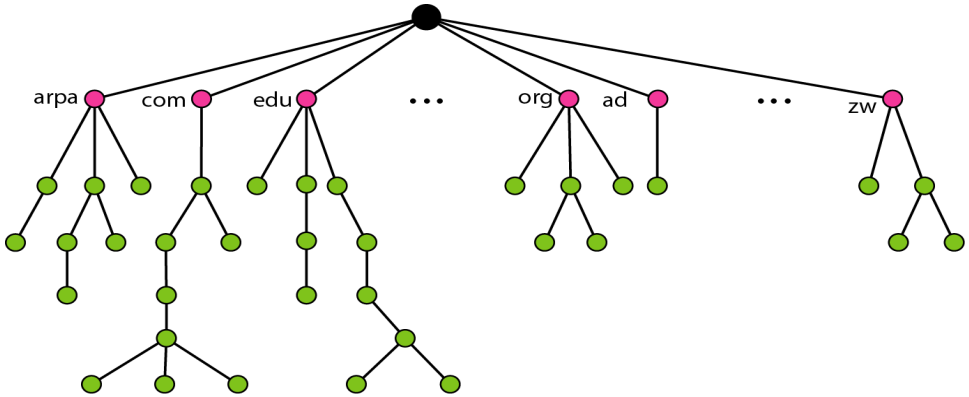
DNS – Domain Name



Domain Name
www.gmail.com

- ✓ Sequence of labels from a node to the root
- ✓ Separated by dots (“.”s) and Read left to right
- ✓ Length: 255 Characters
- ✓ A node’s Domain Name identifies its Position in the Name Space

DNS – Domains and Sub domains

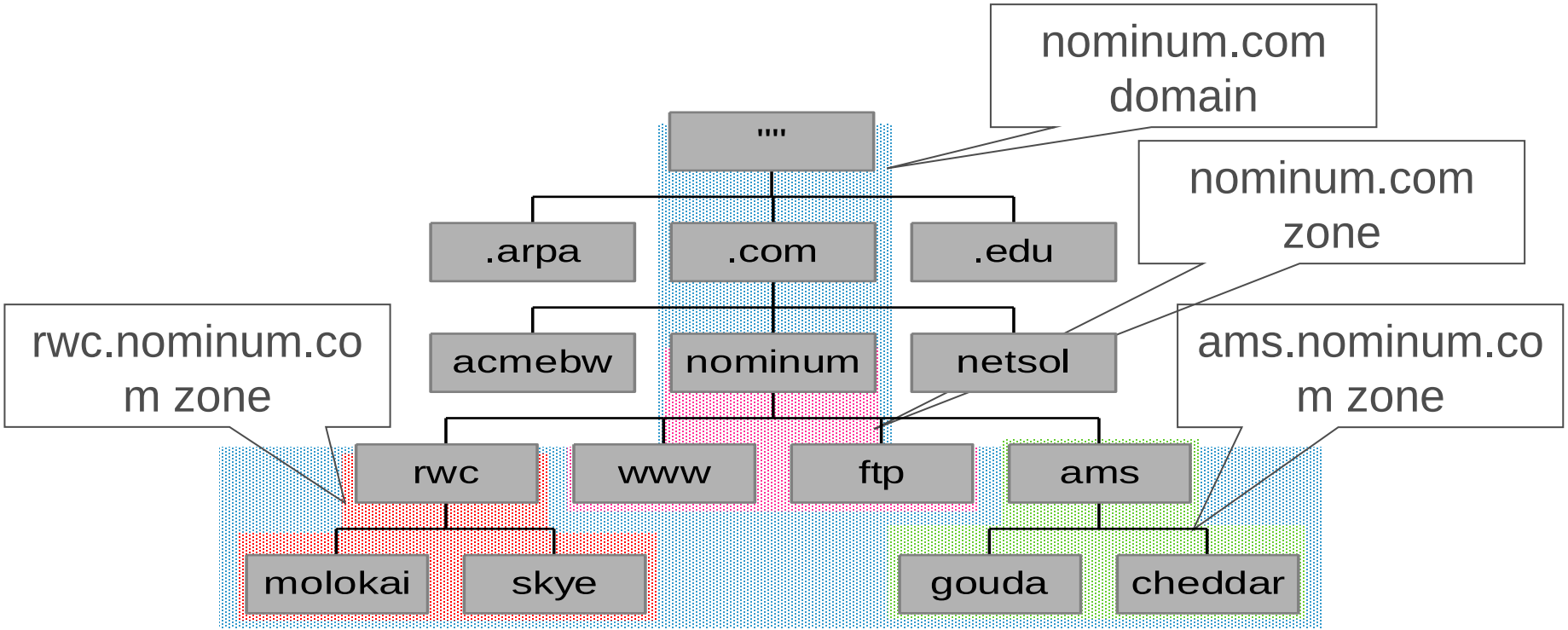


Domain
com

Sub Domain
gmail.com

- ✓ One domain is a sub domain of another if its domain name ends in the other's domain name
- ✓ gmail.com is a sub-domain of com

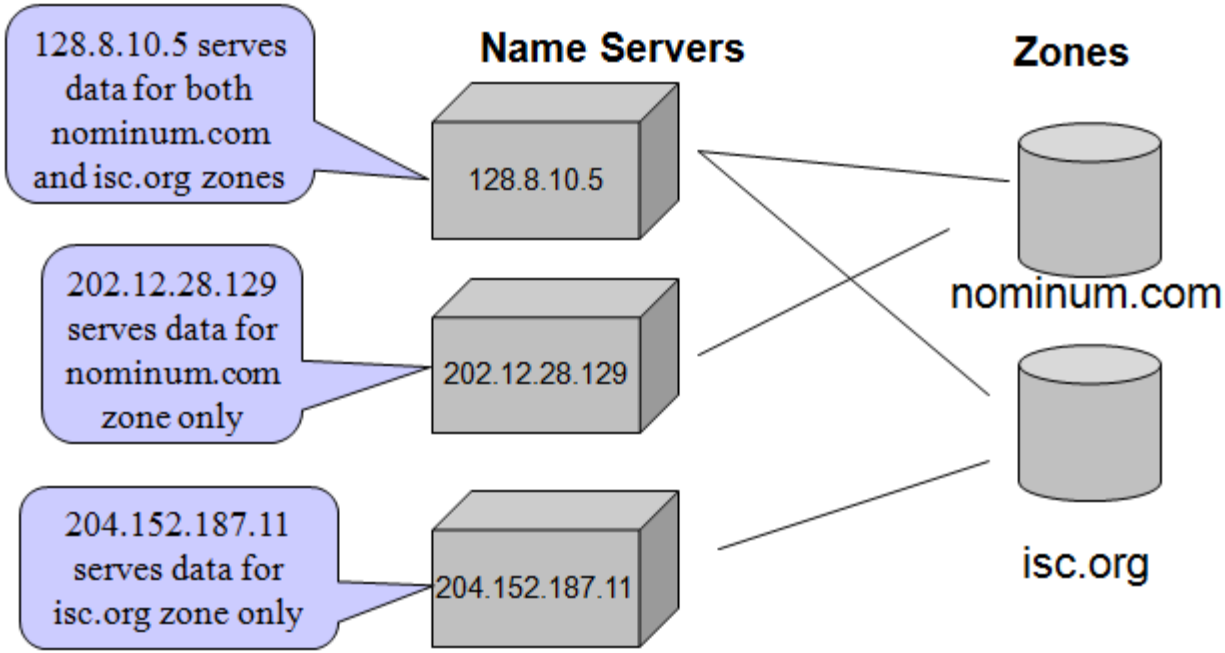
DNS – Domains and Zones



DNS – Name Servers

- ✓ Stores information about the Name Space in units (zones)
  No Special Hardware is required
- ✓ Loads a complete zone. Authoritative for the zone
- ✓ Authoritative: Master – Editing, Slave - Replication
- ✓ More than one Name Server are Authoritative for same zone
- ✓ A single Name Server may be Authoritative for many zones

DNS – Name Servers



References

- ✓ Books: Data communication and Networking, Behrouz A Forouzan, Fourth edition
- ✓ Computer Networks, Andrew S. Tanenbaum, 4th edition, PHI
- ✓ Data Communication and Networks, Achyut Godbole, 2007, TMH.
- ✓ Computer Networks: Protocols, Standards, and Interfaces, Uyless Black, 2nd ed, PHI
- ✓ Various relevant websites
- ✓ Referred to slides by David Conrad at nominum.com

Thank You