## **DNS**

# History

- Hosts file
  - flat namespace
  - $\circ$  possible duplicates
  - $\circ$  unwieldy

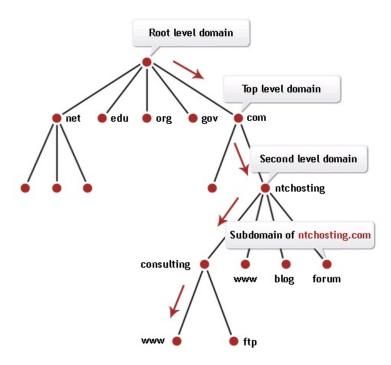
#### DNS What is it?

- ICANN Internet Corporation for Assigned Names and Numbers
- IANA Internet Assigned Numbers Authority
  - department of ICANN?
  - manages the root zone (top of hierarchy)
  - manages global pool of IP addresses

#### DNS What is it?

- Do we need it to use the internet?
- Registrar
  - o puts your domain into the global registry
  - Each TLD has only one authoritative registry
  - Verisign
  - o <u>Tld registry db</u>

## The Hierarchy



# A simple view



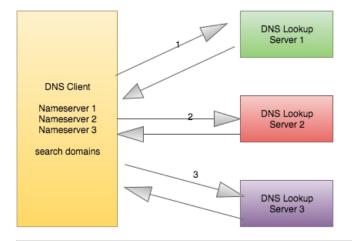
#### More

- OSI model? Ports? UDP
- Zone transfers always done with TCP
- UDP is almost always use to query first, but may switch to TCP if response is too large.

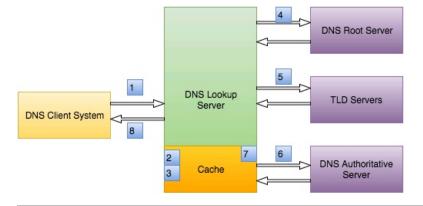
#### **DNS Client View**

- Youtube video
- Timeouts
- Search Domain

#### **DNS Client View**



# **Lookup Server View**



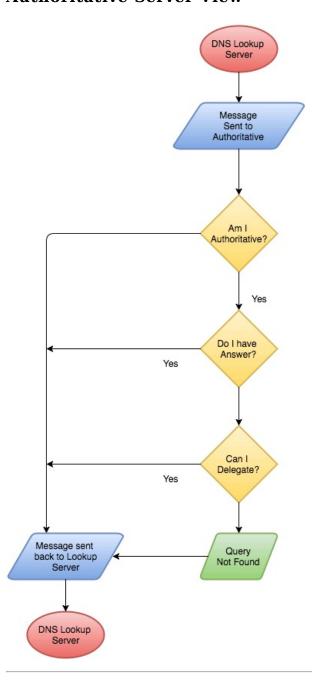
# **Lookup Server Steps**

- 1. Client makes request to lookup server
- 2. Lookup server checks to see if request is saved in cache
- 3. If it is, is it still valid?
- 4. Query root server to find address of tld nameserver
- 5. Query TLD server to find address of domain nameserver
- 6. Query authoritative domain server to find address of host
- 7. Store results in cache
- 8. Return results to client

## **Lookup server Misc**

- TTL
  - $\circ\,$  Amt of time (in seconds) the record can be cached by any resolver
  - o low value: more load on DNS server
  - too hi: stale cache entries
- Recursive lookups
- Security?

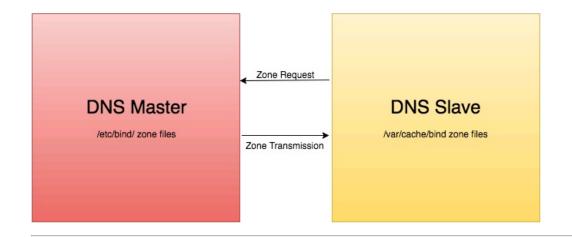
## **Authoritative Server View**



# **Subdomains and Delegation**

- When the authoritative name server for a domain receives a request for a subdomain's records and responds with NS records for other name servers, that is DNS delegation.
- <u>visual</u>

### Master/Slave Authoritative Server Views



# **Finally**

- Notify
- Serial Numbers