

Introduction to the Domain Name System (DNS)

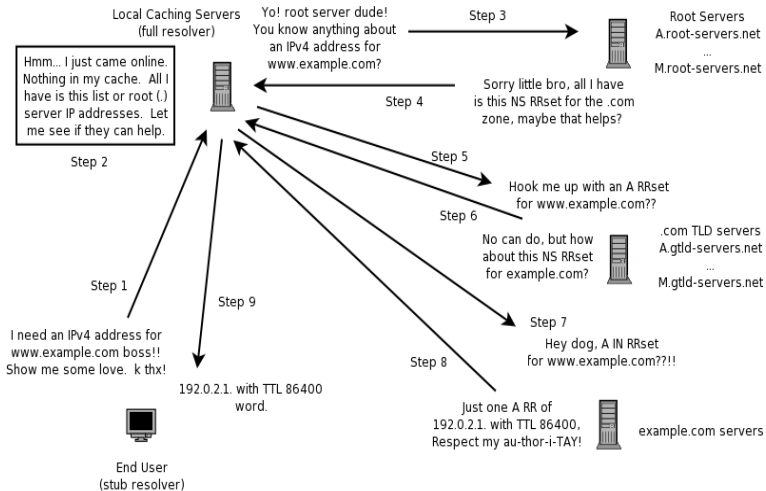
<http://condor.depaul.edu/~jkristof/it263/>

John Kristoff

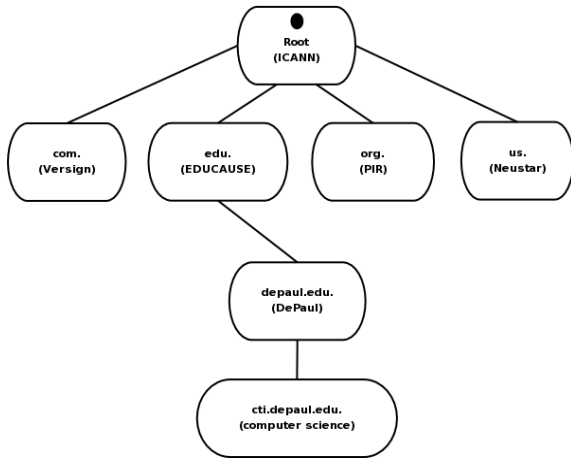
jtk@depaul.edu

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The DNS Lookup Process



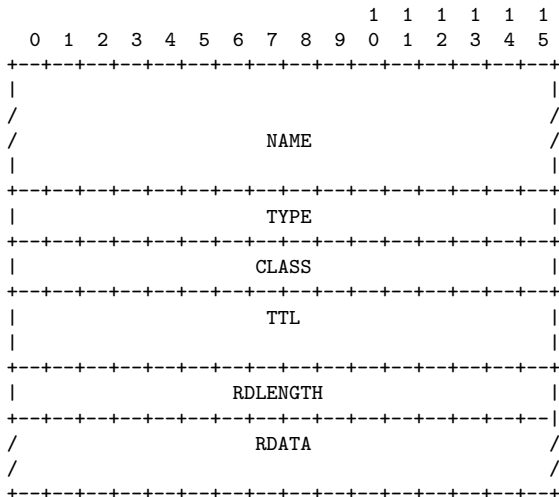
Zone Delegation



Delegation and Glue Records

- Parent contains non-authoritative name server (NS) resource records (RRs) for the child zone
- Say you want to resolve `www.depaul.edu`
- Say we start fresh and walk the tree from the top/root (.)
- `.edu` zone name servers gives referral for `ns[1-3].depaul.edu`
- But how do you contact those name servers? You need to resolve those names to an address
- Solution: you are also given the IP address (aka glue) records to those name servers
- An aside: Out-of-balliwick versus in-balliwick glue

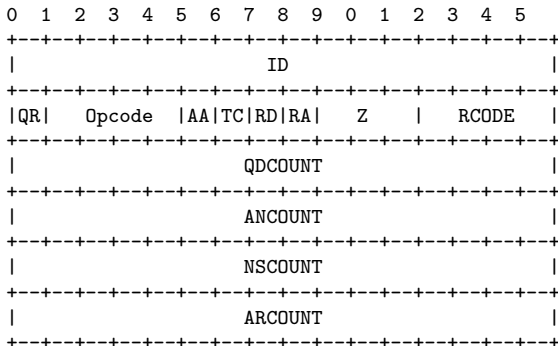
Resource Record (RR) format



DNS Message Format

Header	
Question	the question for the name server
Answer	RRs answering the question
Authority	RRs pointing toward an authority
Additional	RRs holding additional information

DNS Message Header Format



Sources of Authoritative Data

- Where does authority come from? Zone delegation from a parent.
- However, the child is *authoritative* for the NS RRset.
- Primary/Master name server - zone data from a local source
- Secondary/Slave name server - zone data obtained from another slave/master

Resolver Types and Terms

- Caching (Recursive) name server - what is typically in your resolv.conf
- Forwarding name server - sometime called proxy DNS
- Stub resolver - what end systems use, simple message passer
- An aside: jtk terminology - full, caching, referral and closed resolvers

Server Types and Terms

- Iterative - querier will chase delegations
- Recursive - querier requests server to chase delegations and return a final answer
- Authoritative - has local knowledge
- Non-authoritative - does not have local knowledge, probably cached or just received auth answer from someone else

Things that make DNS interesting

- General lack of agreement on *what DNS is and how to run it*
- Implementations differ, particularly in handling corner cases
- Admins have great control over configuration and policy
- UDP without authentication in an upper layer required

Administrative Services

- Registry - organization responsible for maintaining TLD (usually) zone data
- Registrar - the interface between registry and domain name holders (sometimes the same as the registry, often not)
- whois - a TCP-based Internet directory service, run by various DNS and address registries, there is no central whois