

TNE30019/TNE80014 – Unix for Telecommunications

DNS – Domain Name System

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DNS – Domain Name System

- Allows forward (name to IP address) and reverse (IP address to name) resolution
- **Hierarchical** system which distributes “ownership” and responsibility of network domains
- Forward and reverse lookups are independent

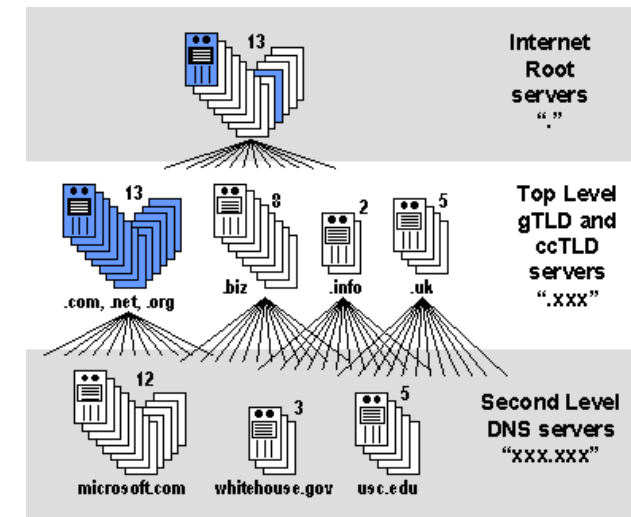
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Outline

- Domain Name System (DNS)
- BIND – Berkeley Internet Name Daemon
- Server configuration
- Zone configurations
- Running the server

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DNS – Server Hierarchy

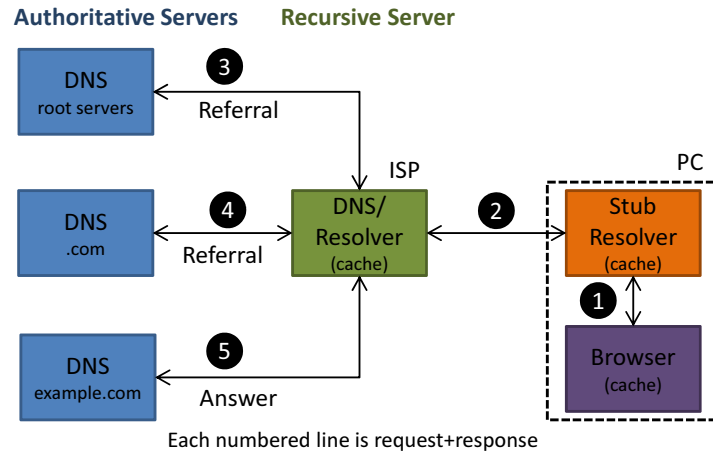


Source: http://archive.icann.org/en/tlds/org/applications/uia/C17_10.html

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DNS – A DNS Request

Query: **www.example.com**



2: **Recursive** query ("Give me an answer")

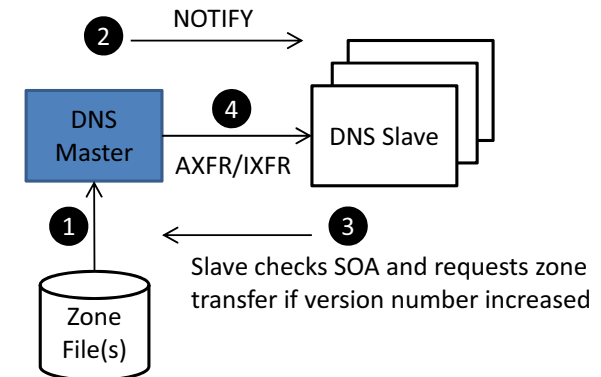
3,4,5: **Iterative** queries ("Give me answer **or** tell me who knows")

DNS – Master and Slave Servers

Multiple servers to share the load:

Primary server / Master

Secondary server / Slave



DNS – Domain Name System

- Lots of server implementations available
- FreeBSD comes with BIND¹ pre-installed
- 2010 Study commissioned by Infoblox²:
 - Random servers 34.2% running BIND (57.2% of identifiable)
 - 2nd-level servers 53.9% running BIND (92.6% of identifiable)

FreeBSD Install

```
cd /usr/ports/net/bind9
make && make install
```

Configuration Files

```
/usr/local/etc/namedb/
/usr/local/etc/namedb/named.conf
```

¹<http://www.isc.org/products/BIND/bind9.html>

²<http://dns.measurement-factory.com/surveys/201010/>

named.conf – Global Configuration Options

- Specify system behaviour
- Upstream DNS Servers
- Location of other database files

Important Global Options

```
version
directory "/location/of/database/files";
listen-on vs allow-query
forward and forwarders
pid-file
```

- Definition of domain names **AND** files storing database
- Database files storing resolution information
- Forward and Reverse resolution information is separated
- Reverse zone names format is 0.168.192.in-addr.arpa which means 192.168.0.*

Common Host Definition Types

- **NS** — Name Server
- **A** — IPv4 Address
- **AAAA** — IPv6 Address
- **MX** — Mail Server
- **CNAME** — Canonical Name
- **PTR** — Reverse Host Number

```
/etc/rc.conf
```

```
named_enable="YES"
```

Startup script (for named):

- Daemon started by /etc/rc.d/named