Domain Name System (DNS)

Setting up an Authoritative Name Server

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Objectives

- Write a valid zone file
- Explain how the SOA record is used
- The **`named.conf`** file
  - Configure a master nameserver for a domain
  - Configure a slave nameserver for a domain
- Choose a suitable secondary nameserver (RFC-2182)
- Reload a running nameserver and check the log files

The Zone Data Files

- Most entries are called DNS resource records (RR)
- Resource records must start in the first column of a line.
- The order in which RRs appear though not a requirement are as follows:

The Zone Data Files

- SOA records
  - Indicates authority for the zone
- NS records
  - Lists a name server for the zone
- Other records
  - A
    - Name-to-address mapping
  - PTR
    - Address-to-name mapping
  - CNAME
    - Canonical name (for aliases)

The Zone Data Files

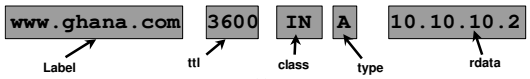
- Comments make zone data files easier to read and understand
- Comments start with a semi-colon (;) and finish at the end of the line
- The nameserver ignores comments and blank lines.

Setting the default TTL (RFC-2308)

- $TTL is used to set the default TTL for a zone
- It sets the TTL for all records in the file that follow it
- Nameservers supply this TTL in query responses, allowing other servers to cache the data for the TTL interval
- $TTL values are usually between 1-hour (1h) and 1-week (1w)
- $TTL is used for BIND version 8.2 and later.

Structure of Resource Records

- Resource records consist of it's name, it's TTL, it's class, it's type and it's RDATA
- TTL is a timing parameter
- IN class is widest used
- There are multiple types of RR records
- Everything behind the type identifier is called rdata



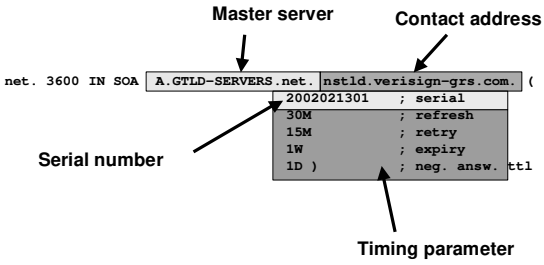
RRs in a Zone File

```
ripe.net.    2h    IN    SOA    ns.ripe.net.   olaf.ripe.net. (
                                  2003061000    ; Serial
                                  12h           ; Refresh 12 hours
                                  4h            ; Retry 4 hours
                                  4d            ; Expire 4 days
                                  2h            ; Negative cache 2 hours
                           )
ripe.net.          2h    IN    NS     ns.ripe.net.
ripe.net.          2h    IN    NS     ns.eu.net.

pinkie.ripe.net.   1h    IN    A      193.0.1.162
host25.ripe.net.   1h    IN    A      193.0.3.25
```

Label ttl class type rdata

Resource Record: SOA



The `named.conf` file

- The named.conf file is the configuration file read when the named daemon starts up
- Is used to control the behavior of the named daemon

Named.conf:- Master Config. For Domain

```
options {
        directory "/etc/namedb";
};

/*
Comment
*/

// Another Comment Style
//

zone "domain.com" {
        type master;
        file "m/domain.com.bak";
};
```

Domain Name
Server Type
Zone Data File

Named.conf:- Slave Config. For Domain

```
options {
        directory "/etc/namedb";
};

/*
Comment
*/

// Another Comment Style
//

zone "domain.com" {
        type slave;
        file "s/domain.com.bak";
        masters { 192.168.1.1; };
};
```

Domain Name
Server Type
Zone Data File
IP Address of Master

Choice of Sec. Name Server (RFC-2182)

- See DNS Session 2

Reloading a running server

- To reload a running server the ndc utility is used (BIND 8)
- E.G.

```
# ndc reload
# ndc reload <domain>
```


Reload a running server & check the logs

- To reload a running server the ndc utility is used in BIND 8
- E.G.

```
# ndc reload
# ndc reload afnogws.gh
```

- After reloading the server you should check for errors in the log files

```
# grep named /var/log/messages
```


Some Common Errors

- Forgot to increment Serial Number
- Forgot to Reload Primary Name Server
- Slave Name Server Can't Load Zone Data
- Syntax Error in Configuration File or Zone Data File
- Missing Dot at the End of a Domain in Zone Data File

Some Common Errors

- Missing Root Hints Data
- Loss of Network Connectivity
- Missing Sub-domain Delegation
- Incorrect Sub-domain Delegation

- See DNS and BIND 4th edition, Chapter 14 on Troubleshooting DNS and BIND