Recursive Server

Overview

- Recursive Service
- Root server list
- localhost
- 0.0.127.in-addr.arpa
- named.conf

Recursive Server

- Used to lookup data by applications
- Needs to know how to reach top of DNS
- Also should stop some queries
  - localhost, 127.0.0.1
- Files
  - named.conf
  - root.hints
  - localhost zone
  - 0.0.127.in-addr.arpa zone
- We'll do named.conf last

Root server list

- List of the 13 root server records
- Where to get it
  - ftp rs.internic.net
    - anonymous login
    - cd domain
    - get one of these files (they are [nearly] the same)
      - db.cache
      - named.root
      - named.cache

What it looks like

```
;       This file holds the information on root name servers needed to
;       initialize cache of Internet domain name servers
;       (e.g. reference this file in the "cache  .  <file>"
;       configuration file of BIND domain name servers).
;
;       This file is made available by InterNIC
;       under anonymous FTP as
;           file            /domain/named.cache
;           on server       FTP.INTERNIC.NET
;
;       last update:   Nov 5, 2002
;       related version of root zone:  2002110501
;
;
; formerly NS.INTERNIC.NET
;
.                        3600000  IN  NS   A.ROOT-SERVERS.NET.
A.ROOT-SERVERS.NET.      3600000      A    198.41.0.4
;
; .................
; housed in Japan, operated by WIDE
;
.                        3600000     NS    M.ROOT-SERVERS.NET.
M.ROOT-SERVERS.NET.      3600000      A    202.12.27.33
; End of File
```
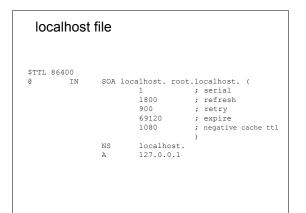
What you do to this file (hints file)

- Nothing
- You will refer to it in named.conf using a zone statement
- In real networks, don't change it
  - But for learning, we will change it

localhost

- Loopback name in operating systems
- Means 127.0.0.1
- Queries for this shouldn't use recursion
- So we will configure a file to define the localhost. zone
  - Note the "."

localhost file

```
$TTL 86400
@       IN    SOA localhost. root.localhost. (
                      1           ; serial
                      1800        ; refresh
                      900         ; retry
                      69120       ; expire
                      1080        ; negative cache ttl
                      )
              NS      localhost.
              A       127.0.0.1
```

Reverse for localhost

- Since we want "localhost -> 127.0.0.1" we want to have "127.0.0.1 -> localhost"

- We need a zone called 0.0.127.in-addr.arpa.

0.0.127.in-addr.arpa file

```
$TTL 86400
@       IN      SOA localhost. root.localhost. (
                     1          ; serial
                     1800       ;refresh
                     900        ;retry
                     69120      ;expire
                     1080       ;negative cache ttl
                     )
                NS      localhost.
  1        PTR   localhost.
```
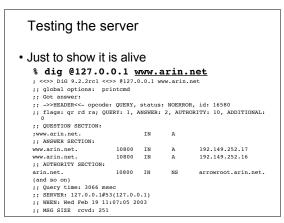
Assembling the files

- Here's my directory:
  ```
  [/var/named/recursive] % ls
  0.0.127.in-addr.arpa    localhost
  named.root
  ```

- The directory name and file names will be in named.conf

- Now I create a named.conf file in the same directory

named.conf

```
options {
      directory "/var/named/recursive";
      recursion yes;   // by default recursion is on
};
zone "." {
      type hint;
      file "named.root";
};
zone "localhost." {
      type master;
      file "localhost";
};
zone "0.0.127.in-addr.arpa." {
      type master;
      file "0.0.127.in-addr.arpa";
};
```

Running the server

- From the directory
  ```
  % named -g -c named.conf
  ```

Testing the server

- Just to show it is alive
  ```
  % dig @127.0.0.1 www.arin.net
  ; <<>> DiG 9.2.2rc1 <<>> @127.0.0.1 www.arin.net
  ;; global options:  printcmd
  ;; Got answer:
  ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 16580
  ;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 10, ADDITIONAL:
    0
  ;; QUESTION SECTION:
  ;www.arin.net.                  IN     A
  ;; ANSWER SECTION:
  www.arin.net.         10800  IN     A      192.149.252.17
  www.arin.net.         10800  IN     A      192.149.252.16
  ;; AUTHORITY SECTION:
  arin.net.             10800  IN     NS     arrowroot.arin.net.
  (and so on)
  ;; Query time: 3066 msec
  ;; SERVER: 127.0.0.1#53(127.0.0.1)
  ;; WHEN: Wed Feb 19 11:07:05 2003
  ;; MSG SIZE  rcvd: 251
  ```

Congratulations - Your First Server!

- It's just the beginning...

Questions ?