



Recursive Server 101

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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

- Nothing
- You will include it in named.conf
- 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

```
$ORIGIN localhost.  
$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 -> 127.0.0.1"
- We need a zone called 0.0.127.in-addr.arpa



0.0.127.in-addr.arpa file

```
$ORIGIN 0.0.127.in-addr.arpa.  
$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:

```
[~/DNS/apricot2003/recursive] edlewis% 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 "/Users/edlewis/DNS/apricot2003/recursive";
    pid-file "/Users/edlewis/DNS/apricot2003/recursive/n.pid";
    recursion yes;
};
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
 - ◆ `sudo named -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?

Questions, anyone?