

# DNS

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@alwaysdns

[www.ItsAlwaysDNS.com](http://www.ItsAlwaysDNS.com)



**core computing  
technologies, inc.**  
*Rocket Science, Simplified®*



# So What is DNS?

IP Addresses

75.101.132.77





# How DNS Works

- Recursive vs. Iterative
- Forward and Reverse Queries
- FQDN
- Records





# How Does DNS Work

1976





# How Does DNS Work

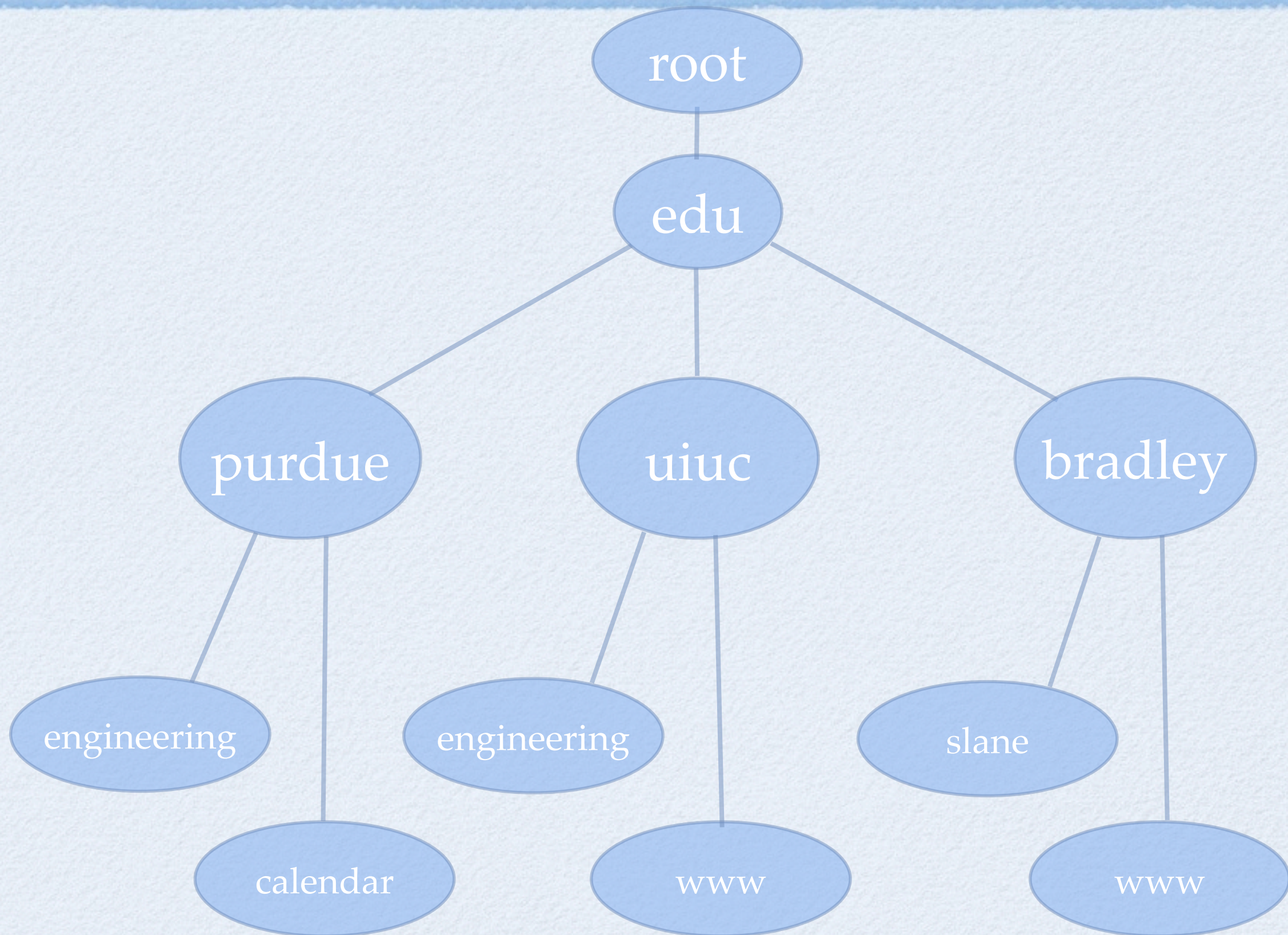
2012

<http://www.apple.com>





# The Magic





# Queries

## Recursive



I don't have that answer for you but if you'll please hold I'll look that up.





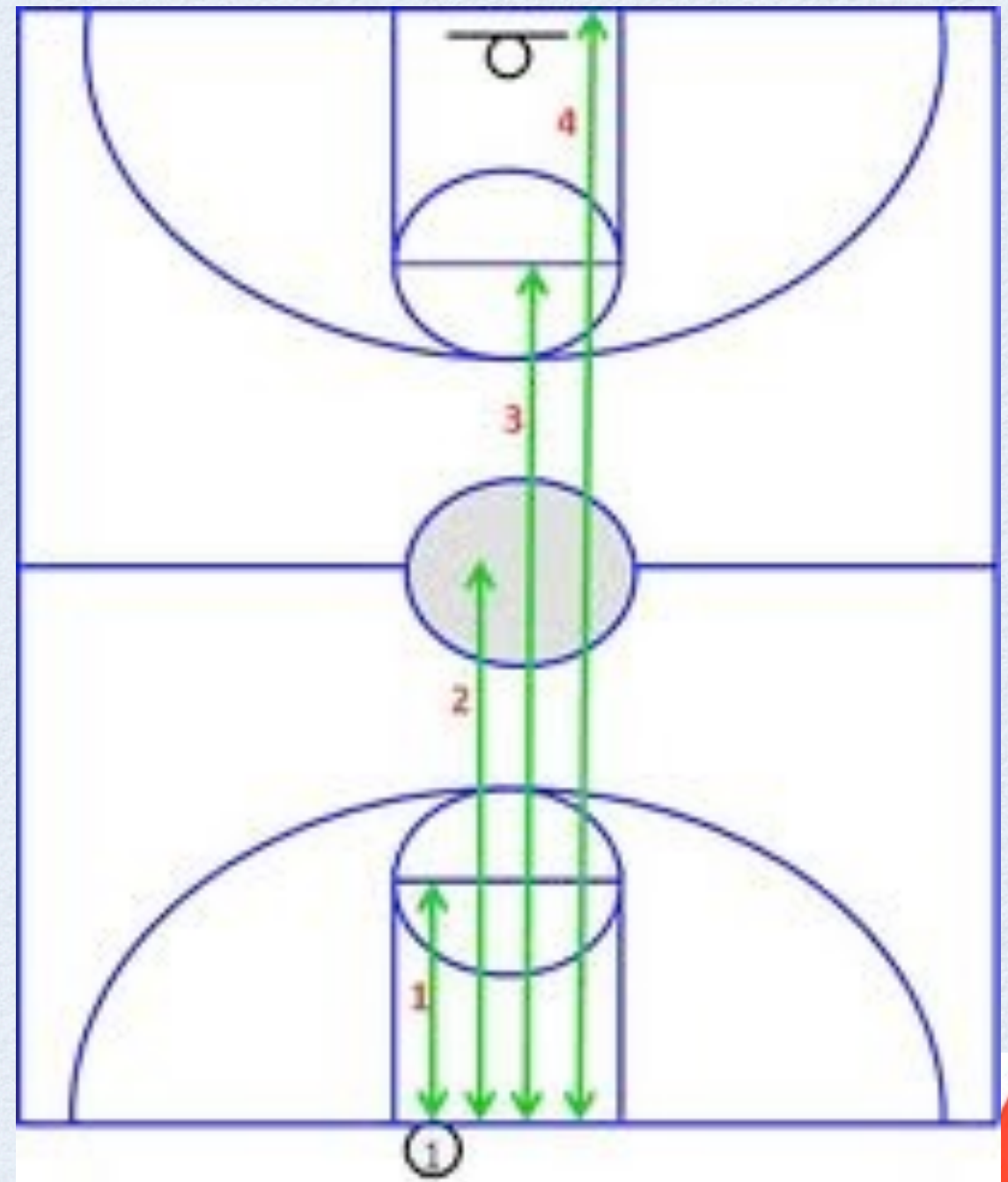
# Queries

## Iterative

**local server:** I don't have the IP address you seek, but let me send you to the authoritative name servers for that TLD.

**.edu:** I don't have the IP address you seek, but the authoritative name server at purdue can tell you.

**.purdue.edu:** I **do** have the host's address and it's over there at engineering which is 172.16.14.2.





# LAN DNS

- Defining a Primary Zone
- Authoritative Server
- Secondary Zone
- Caching Only (Forwarding) Server
- Choosing your name





# CD's...er, Records...

- NS
- A / AAAA
- PTR
- CNAME
- MX
- TXT
- SRV





# CD's...er, Records...

- NS

- 10800 IN **NS** ns1.example.camp.

```
example.camp.      10800 IN SOA  example.camp. pam.example.camp. (
                    2012010105 ; serial
                    20864     ; refresh (5 hours 47 minutes 44 seconds)
                    3600      ; retry (1 hour)
                    14976     ; expire (4 hours 9 minutes 36 seconds)
                    10800     ; minimum (3 hours)
                    )
                    10800 IN NS      ns1.example.camp.
```









# CD's...er, Records...

- A Record

- mail.example.camp. IN **A** 192.168.59.10
- mactech.example.camp. IN **A** 192.168.59.11

- AAAA Record

- mactech.example.camp. IN **AAAA** fe80::202:b3ff:fe1e:8329

```
example.camp.      10800 IN SOA  example.camp. pam.example.camp. (
                                2012010105 ; serial
                                20864      ; refresh (5 hours 47 minutes 44 seconds)
                                3600       ; retry (1 hour)
                                14976     ; expire (4 hours 9 minutes 36 seconds)
                                10800     ; minimum (3 hours)
                                )
ns1.example.camp.  10800 IN NS   ns1.example.camp.
mail.example.camp. 10800 IN A    192.168.59.09
mactech.example.camp. 10800 IN A    192.168.59.11
mactech.example.camp. 10800 IN A    192.168.59.10
mactech.example.camp. 10800 IN AAAA fe80::202:b3ff:fe1e:8329
```





# CD's...er, Records...






- PTR

- `10.59.168.192.in-addr.arpa.PTR IN 100000 mail.example.camp.`
- `11.59.168.192.in-addr.arpa.PTR IN 100000 mactech.example.camp.`


```
59.168.192.in-addr.arpa.      10800 IN SOA  3.2.1.in-addr.arpa. pam.3.2.1.in-addr.arpa. (
                                2012010105 ; serial
                                86400   ; refresh (1 day)
                                3600    ; retry (1 hour)
                                604800  ; expire (1 week)
                                345600  ; minimum (4 days)
                                )
10.59.168.192.in-addr.arpa.  10800 IN NS   ns1.example.camp.
11.59.168.192.in-addr.arpa.  10800 IN PTR  mail.example.camp.
                             10800 IN PTR  mactech.example.camp.
```





 Overview
  Log
  **Zones**
 Bonjour
  Settings

Name	Type	Value
▼ 59.168.192.in-addr.arpa.	Reverse Zone	–
192.168.59.09	Reverse Mapping	ns1.example.camp.
192.168.59.10	Reverse Mapping	mail.example.camp.
192.168.59.11	Reverse Mapping	mactech.example.camp.
▼ example.camp.	Primary Zone	–
mactech	Machine	192.168.59.11
mail.example.camp.	Machine	192.168.59.10
ns1	Machine	192.168.59.09

Add Zone ▼
 Add Record ▼
 Remove
 

No selection

Revert
 Save





# CD's...er, Records...






- CNAME

- `www.example.camp.`      `IN`      **CNAME**      `example.camp.`
- `ftp`      `IN`      **CNAME**      `mail`


```
example.camp.      10800 IN SOA  example.camp. pam.example.camp. (
                                2012010105 ; serial
                                20864    ; refresh (5 hours 47 minutes 44 seconds)
                                3600     ; retry (1 hour)
                                14976    ; expire (4 hours 9 minutes 36 seconds)
                                10800    ; minimum (3 hours)
                                )
ns1.example.camp.  10800 IN NS   ns1.example.camp.
mail.example.camp. 10800 IN A    192.168.59.09
mactech.example.camp. 10800 IN A    192.168.59.10
mactech.example.camp. 10800 IN A    192.168.59.11
www.example.camp.  10800 IN AAAA  fe80::202:b3ff:fe1e:8329
ftp                10800 IN CNAME  mail.example.camp.
                  10800 IN CNAME  mactech.example.camp.
```





 Overview
  Log
  Zones
  Bonjour
  Settings

Name	Type	Value
▼ 59.168.192.in-addr.arpa.	Reverse Zone	-
192.168.59.09	Reverse Mapping	ns1.example.camp.
192.168.59.10	Reverse Mapping	mail.example.camp.
192.168.59.11	Reverse Mapping	mactech.example.camp.
▼ example.camp.	Primary Zone	-
mactech	Machine	192.168.59.11
mail.example.camp.	Machine	192.168.59.10
ftp.example.camp.	Alias	mactech
ns1	Machine	192.168.59.09
www.example.camp.	Alias	mail.example.camp.

Add Zone ▼
 Add Record ▼
 Remove
 

Alias Name: 
☒ Fully Qualified

Destination: 
☐ Fully Qualified

Revert
 Save










# CD's...er, Records...

- MX
  - `example.com. MX 10 mail.example.com.`
  - `example.com. MX 30 mactech.example.com.`
- Resource
  - <http://domainmx.net/mxsetup.shtml>

```
example.camp.      10800 IN SOA  example.camp. pam.example.camp. (
                                2012010105 ; serial
                                20864      ; refresh (5 hours 47 minutes 44 seconds)
                                3600       ; retry (1 hour)
                                14976     ; expire (4 hours 9 minutes 36 seconds)
                                10800     ; minimum (3 hours)
                                )
ns1.example.camp.  10800 IN NS   ns1.example.camp.
mail.example.camp. 10800 IN A    192.168.59.09
mactech.example.camp. 10800 IN A    192.168.59.10
mactech.example.camp. 10800 IN A    192.168.59.11
www.example.camp.  10800 IN AAAA  fe80::202:b3ff:fe1e:8329
ftp                10800 IN CNAME mail.example.camp.
                  10800 IN CNAME mactech
example.camp.      IN MX 10   mail.example.camp.
example.camp.      IN MX 30   mactech.example.camp.
```





 Overview
  Log
  Zones
  Bonjour
  Settings

Name	Type	Value
▼ 59.168.192.in-addr.arpa.	Reverse Zone	-
192.168.59.09	Reverse Mapping	ns1.example.camp.
192.168.59.10	Reverse Mapping	mactech.example.camp.
192.168.59.11	Reverse Mapping	mail.example.camp.
▼ example.camp.	Primary Zone	-
mactech	Machine	192.168.59.10
mail.example.camp.	Machine	192.168.59.11
ftp.example.camp.	Alias	mactech.example.camp.
ns1	Machine	192.168.59.09

Add Zone ▼
 Add Record ▼
 Remove
 ?

General Expiration

Primary Zone Name:

Admin Email:

☐ Allows zone transfer

☒ Fully Qualified

Nameservers:

Zone	Nameserver Hostname
example.camp.	ns1.example.camp.
<input type="text"/>	

Mail Exchangers:

Hostname	Priority
mactech.example.camp.	30
mail.example.camp.	10
<input type="text"/>	

Revert
 Save





# CD's...er, Records...

- TXT

- `example.com. IN TXT "v-spf1 +mx a:mail.example.com -all"`
- `example.com IN TXT "v-spf1 +mx a:mactech.example.com -all"`

```
example.camp.      10800 IN SOA  example.camp. pam.example.camp. (
                                2012010105 ; serial
                                20864    ; refresh (5 hours 47 minutes 44 seconds)
                                3600     ; retry (1 hour)
                                14976    ; expire (4 hours 9 minutes 36 seconds)
                                10800    ; minimum (3 hours)
                                )
ns1.example.camp.  10800 IN NS   ns1.example.camp.
mail.example.camp. 10800 IN A    192.168.59.09
mactech.example.camp. 10800 IN A    192.168.59.10
mactech.example.camp. 10800 IN A    192.168.59.11
www.example.camp.  10800 IN AAAA  fe80::202:b3ff:fe1e:8329
ftp                10800 IN CNAME mail.example.camp.
                  10800 IN CNAME mactech
example.camp.      IN MX 10  mail.example.camp.
example.camp.      IN MX 30  mactech.example.camp.
example.camp.      IN TXT    "v-spf1 +mx a:mail.example.camp -all"
example.camp.      IN TXT    "v-spf1 +mx a:mactech.example.camp -all"
```





# CD's...er, Records...

- SRV
  - Needed for iCal, AddressBook, iChat Service
    - CLI
      - `/var/named/db.example.com`
    - `_caldav._tcp 86400 IN SRV 0 0 8008 mactech.example.camp.`
    - `_carddavs._tcp 86400 IN SRV 0 1 8443 mactech.example.camp.`
    - `_xmpp-server._tcp 86400 IN SRV 0 1 5269 mactech.example.camp.`
    - `_xmpp-client._tcp 86400 IN SRV 0 1 5222 mactech.example.camp.`
- Resource
  - <http://docs.info.apple.com/article.html?path=ServerAdmin/10.6/en/cs4d72c0a5.html>





Name	Type	Value
▼ 59.168.192.in-addr.arpa	Reverse Zone	-
192.168.59.10	Reverse Mapping	mail.example.camp.
192.168.59.11	Reverse Mapping	mactech.example.camp.
▼ example.camp	Primary Zone	-
_caldav._tcp.	Service	mactech.example.camp.:8008
ftp.example.camp.	Alias	mactech.example.camp.
mactech.example.camp.	Machine	192.168.59.11
mail.example.camp.	Machine	192.168.59.10
www.example.camp.	Alias	mail.example.camp.

Service Name:

Service Type:

Host:

Port:

Priority:  Weight:

TXT:





Location: Automatic

Ethernet  
Connected



Built-in Port (1)  
Not Configured



Built-in Port (2)  
Not Configured



Bluetooth PAN  
Not Connected



Click the lock to prevent further changes.

Status: **Connected**

Ethernet is currently active and has the IP address 192.168.59.10.

Configure IPv4: Manually

IP Address: 192.168.59.10

Subnet Mask: 255.255.255.0

Router: 192.168.59.2

DNS Server: 127.0.0.1

Search Domains:

Advanced... ?

Assist me...

Revert

Apply



Start DNS





```
Last login: Thu Apr 12 21:45:25 on ttys000
mail:~ core$ hostname
mail.example.camp
mail:~ core$ host mail.example.camp
mail.example.camp has address 192.168.59.10
mail:~ core$ host 192.168.59.10
10.59.168.192.in-addr.arpa domain name pointer
mail.example.camp.
mail:~ core$ sudo changeip -checkhostname
```

Primary address     = 192.168.59.10

Current HostName    = mail.example.camp

DNS HostName        = mail.example.camp

The names match. There is nothing to change.

dirserv:success = "success"

mail:~ core\$





# Public Static IP

- Not Necessary!
- Dynamic DNS Services
  - Providers - Free and Paid
  - Update Clients
  - Other services they provide





# Which Way Did He Go?

- Built-in tools
  - nslookup
  - dig
  - mDNSResponder
  - Network Utility
  - host/hostname
  - changeip
  - scutil





# What If My IP Changes

- Public IP Changes
- LAN IP Changes
  - host
  - hostname
  - changeip
  - scutil





# It's Always DNS<sup>®</sup> Stories

Q & A

