

# Chip Holmes, HCS Technology Group

Christopher Holmes is a Senior Engineer/ Technical Training Specialist for HCS Technology Group. While a relative newcomer to the industry he has been delivering high quality consulting and training to customers across the south for the last eight years. Christopher has the privilege of being an Apple Professional Service Provider, Apple Certified Trainer and has served on the Apple Consultant Network Advisory Council for the last three years





# Caching servers, DNS Tricks, and More



# What is caching server

The caching server speeds up the download of software distributed by Apple through the Internet. It caches all software updates, App Store purchases, iBook downloads, iTunes U downloads (apps and books purchases only), and Internet Recovery software that local Mac and iOS devices download.

-Love Apple



Everyone qualifies for caching  
server.....everyone



# Why caching Server



They came in like a wrecking ball.



# OS X Server Requirements

- A Mac running OS X Yosemite (10.10.4 preferably)
- 2gb or ram. (Go big or go home, 16GB is better)
- 10GB of HD
- Ethernet
- A copy of OS X Server (4.1.3 as of this presio)



# Caching Server Requirements

- OS X 10.8.2 or later and not using Software Update service
- iOS 7 or later
- Same public IPv4 address behind NAT
- Non-NAT server address also possible



# What is Cached?

	OS X $\geq$ 10.8.2	iOS $\geq$ 7	Apple TV
Software Updates			
App Store			NA
iBooks			NA
Internet Recovery		NA	
iTunes Media			NA



# What is Cached?

## iTunes and iBooks

- iTunes 11.0.4 and later (both OS X and Windows versions)
- iOS app purchases and updates
- iBooks Store content (both iOS and OS X Mavericks apps)



# What is Cached?

## OS X

- Mac App Store  
(OS X Mountain Lion v10.8.2 Required 10.8.4 or later is recommended)
- OS X software updates
- Other software updates (such as updates to iTunes for OS X)
- GarageBand & other downloadable content (FCPX, Dictation)
- Third-party applications and updates via the Mac App Store
- Java, print drivers, and other system downloads obtained via Software Update
- Internet Recovery OS image download (Mavericks and later)



# What is Cached?

iOS 7 and later and Apple TV

- iOS and Apple TV updates
- iOS apps and updates
- iTunes U course materials from the iOS

App Store and iBooks Store, as well as uploaded instructor materials such as audio, video, iWork, and iBooks Author files

- Certain mobile assets, such as Siri high quality voices, language dictionaries, and more



# Caching Server in Context

Caching server: Compliment, Competitor, or both

Software Update Server

- Old hotness, but still relevant
- Doesn't really help with Mobile devices
- SUS , you have to manage the device
- Caching server, you manage the experience

Netinstall

- Netinstall Service/System Image Utility with the decision to do Monolithic VS Modular imaging. (Don't forget Netboot)
- MDM, DEP & VPP are big fans of caching server
- Managing Apple Devices allows for "Thimaging." Thin imaging



# How Caching Server Works

- Server registers with Apple when it's turned on
- The first requested download is always pulled from Apple and is then cached to the server
- Later downloads come from the server or.....
- The server may have peers on the same network
- Clients always fallback to download directly from Apple if a local caching server can't be reached
- Clients tend to stick with the first good download source



# How Caching Server Works

- The Good:
  - No client-side configuration needed
  - Very little server configuration needed
  - Caching Server 2 has a peer replication service
  - New features allow for more control over service
- The Bad:
  - Relies upon IP addressing not DNS
  - Challenging to work with IP load balancing
  - No built in pre-downloading; caching occurs as packages are requested by clients
  - No control over what is cached
- The Catch:
  - Some installs will require internal DNS TXT records



# Easy Setup

The screenshot displays the Mac OS X Server Management application window. On the left is a sidebar with a tree view containing categories: Server (raccoon, Alerts, Certificates, Logs, Stats), Accounts (Users, Groups), Services (Caching, Calendar, Contacts, File Sharing, Mail, Messages, Profile Manager, Time Machine, VPN, Websites, Wiki, Xcode), and Advanced (DHCP, DNS, FTP, NetInstall, Open Directory, Software Update, Xsan). The 'Caching' service is selected and highlighted in blue.

The main content area is titled 'Caching' and features a green 'ON' toggle switch in the top right corner. Below the title, the 'Access' section shows the status as 'Available - Devices on your local network will automatically use this service' with a link to 'Learn about configuring this service'. The permissions are set to 'All Networks' with an 'Edit...' button.

The 'Settings' section shows the volume is 'Data' and the cache size is '420 GB'. A slider below this allows adjustment from 25 GB to Unlimited, with the current value set at 420 GB. An 'Edit...' button is also present.

The 'Usage' section shows 'Cache Used: 419.68 GB used of 420 GB' with a 'Reset...' button. Below this is a horizontal bar chart showing the usage breakdown: 'Mac Software' (blue, approximately 150 GB), 'iOS Software' (purple, approximately 260 GB), and 'Other' (yellow, approximately 9 GB).



# Registration

What happens when you turn it on?

OS Server Registers your:

Public IPV4 Address

Local IPV4 Address

Local Network Range

and your country

\*updates registration when change settings



# How caching server works...



local address: 192.168.2.78  
public IP: 24.172.20.238

GUID:2BC5071E-7007-476F-A18D-78EA55C84991





# How caching server works...



local address: 192.168.2.78  
public IP: 24.172.20.238



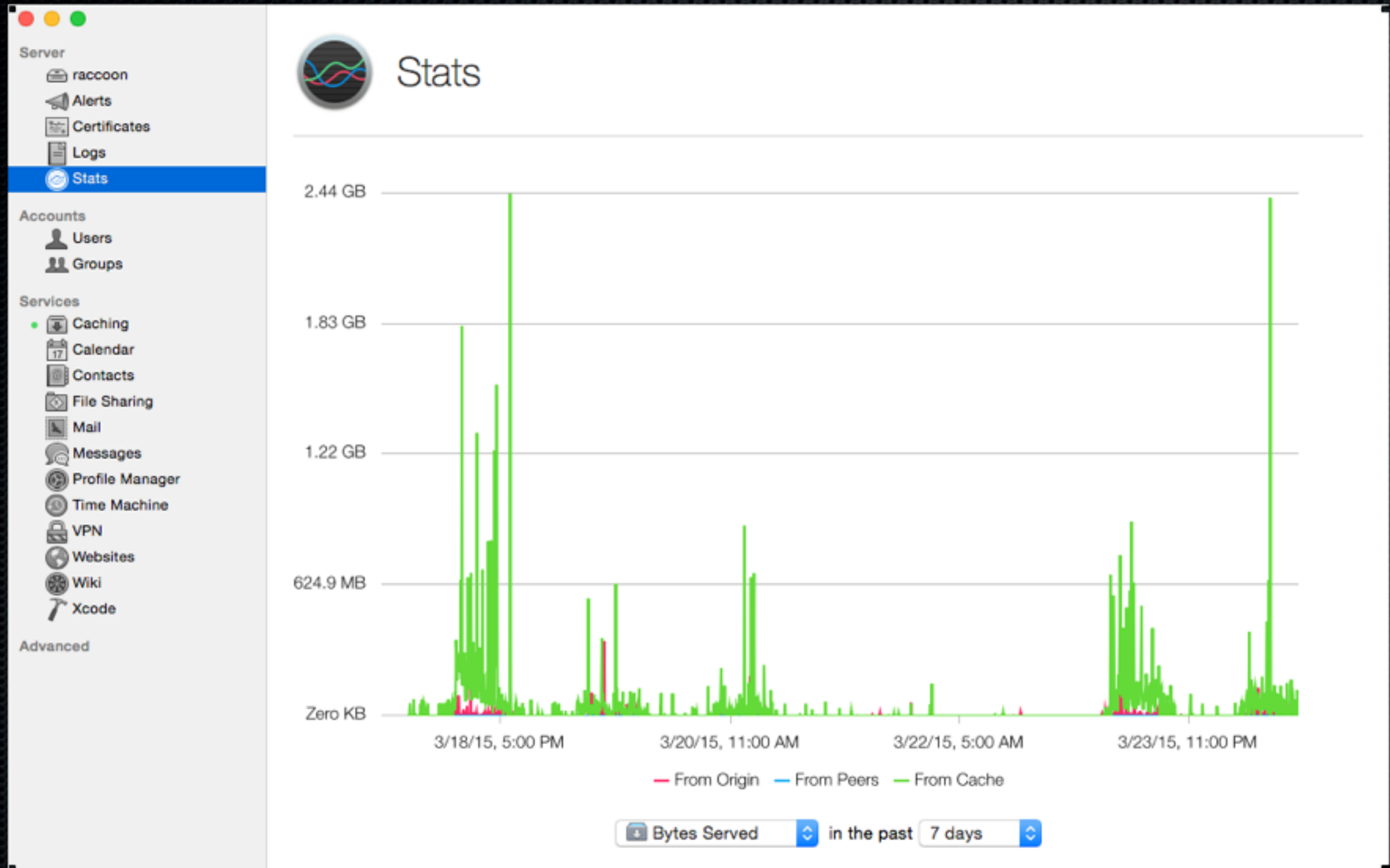
Request for package



local address: 192.168.2.33  
public IP: 24.172.20.238



# Easy Monitoring






# Scenarios - SOHO Network

**Caching**  
Configure how devices use this caching server.

Cache content for clients connecting from: all networks

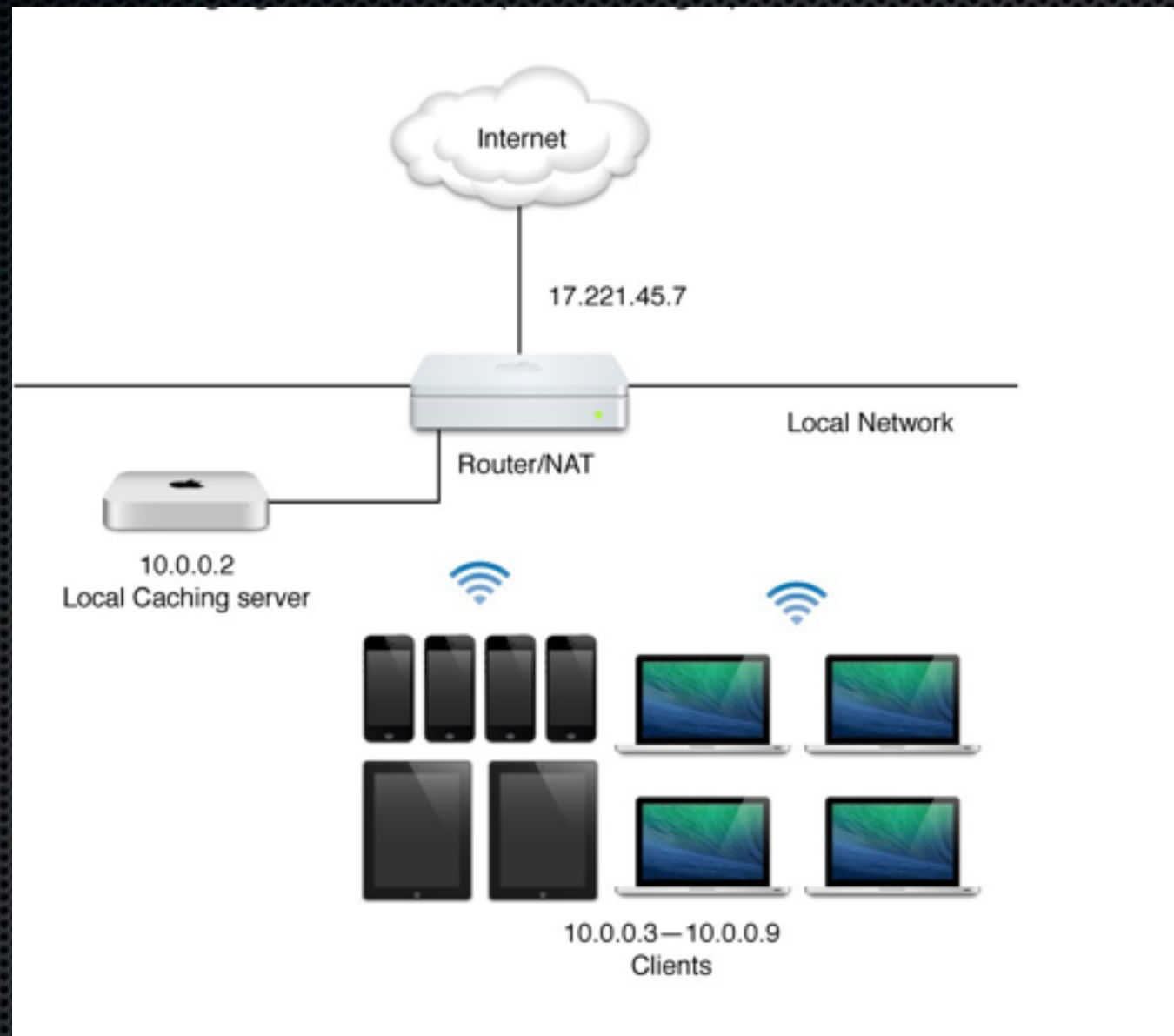
Serve clients with public addresses: matching this server's network

Clients originating from the same public IP address will use this cache.

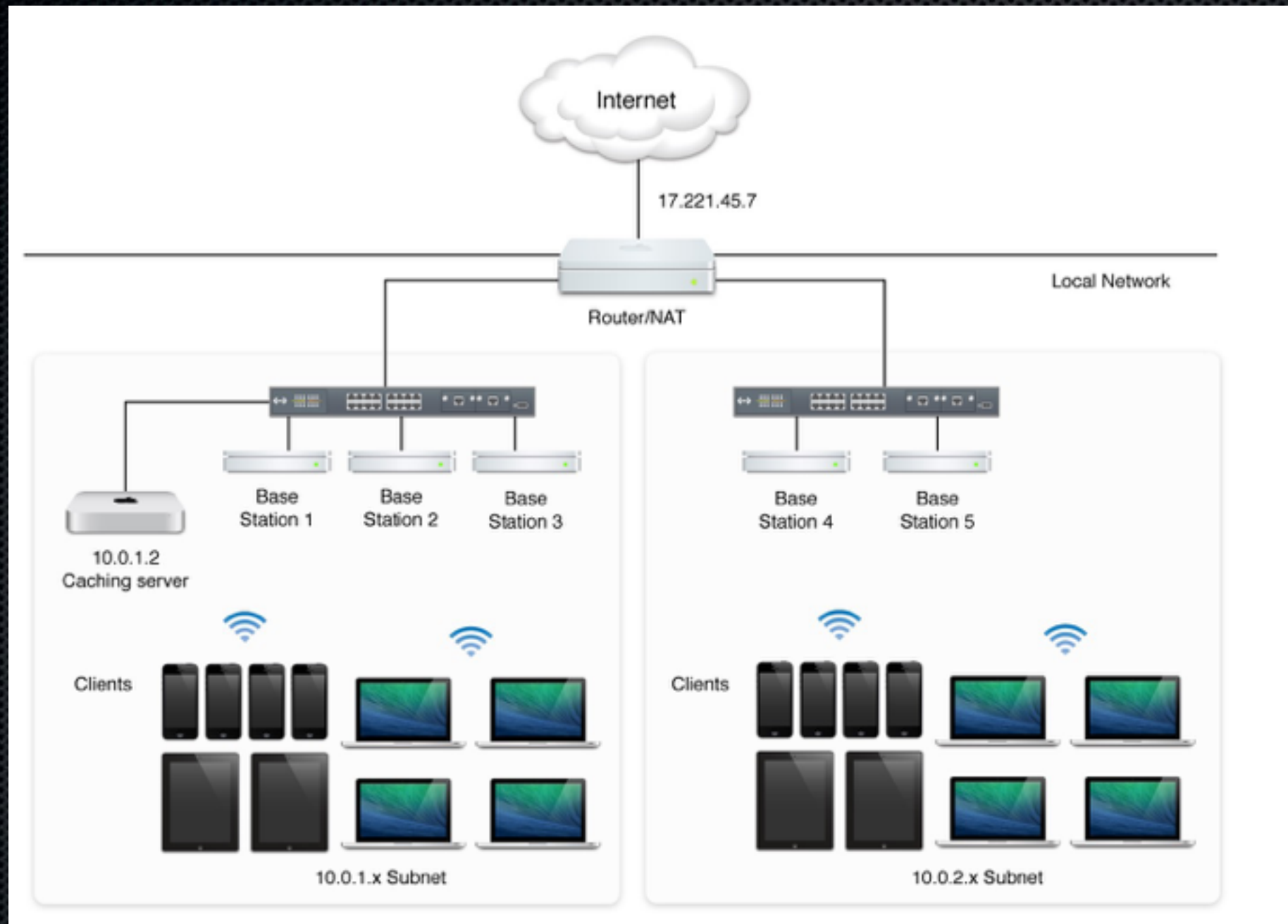


# Example: Single IP Single Subnet



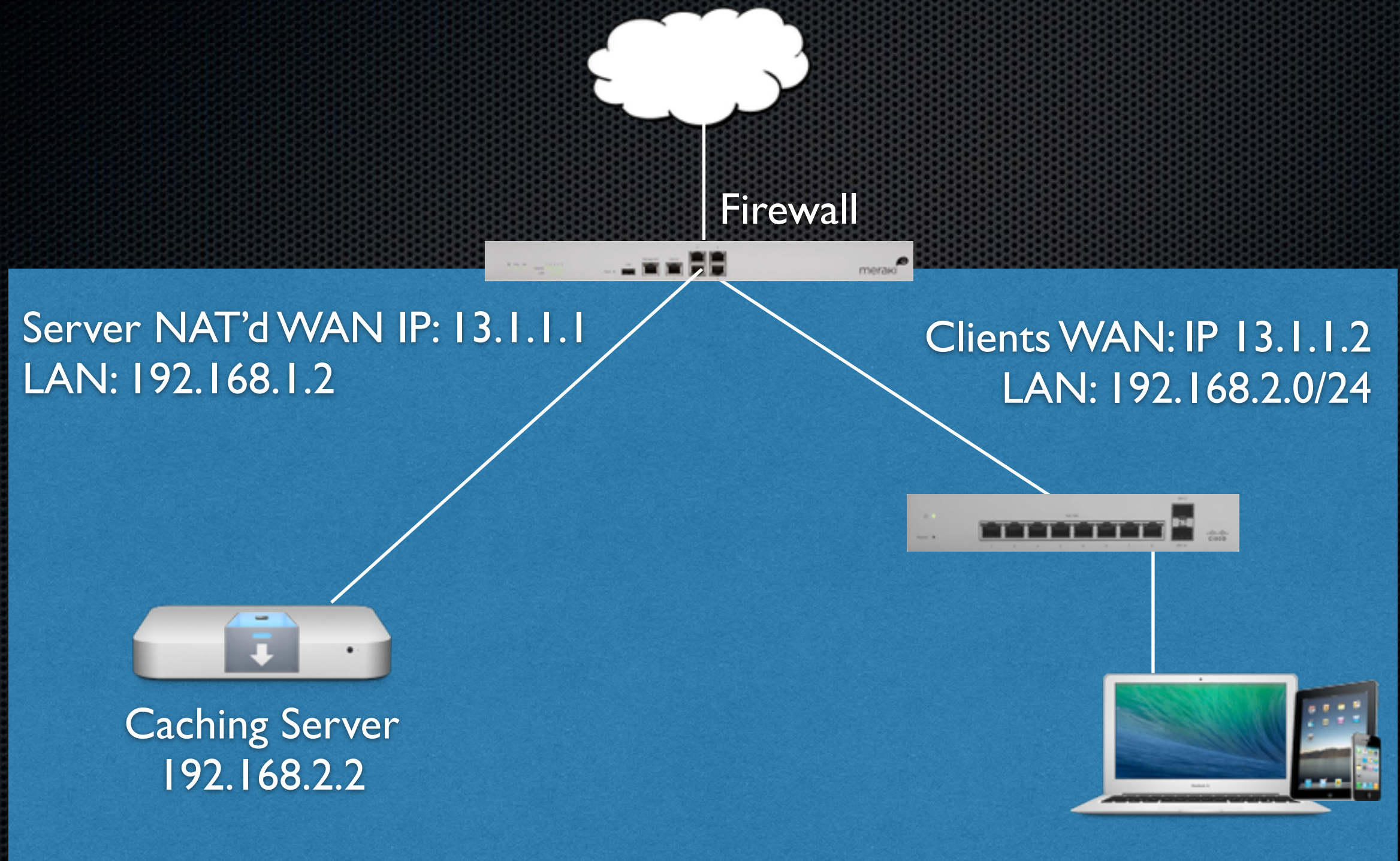


# Example: Single IP Separate Subnet



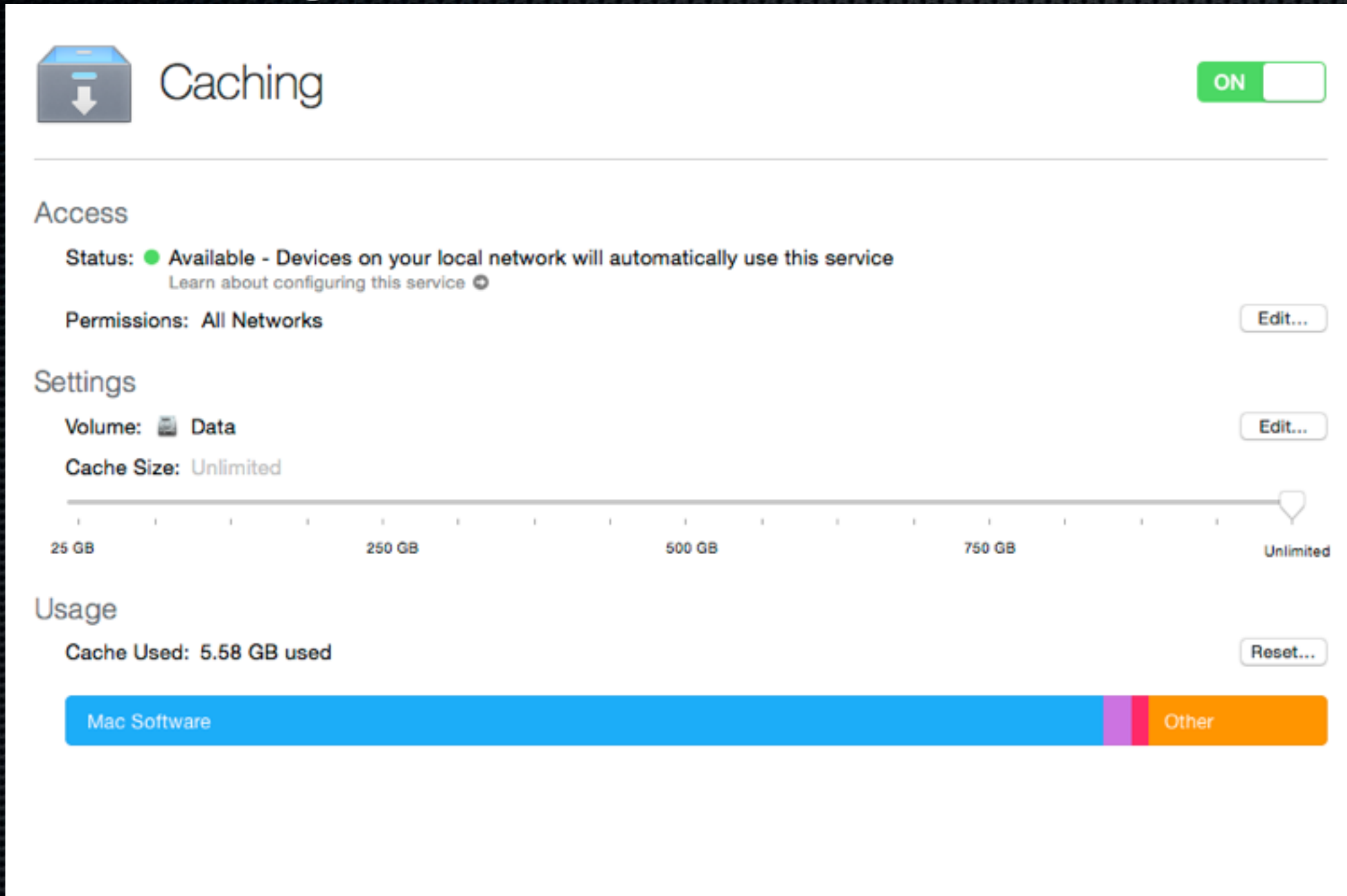


# Example - Multiple Public IPs





# Caching in non-NAT networks



The screenshot displays the 'Caching' configuration page. At the top, there is a 'Caching' header with a download icon and a green 'ON' toggle switch. Below this, the 'Access' section shows the status as 'Available' with a green dot and a link to learn more. The permissions are set to 'All Networks' with an 'Edit...' button. The 'Settings' section shows the volume as 'Data' and the cache size as 'Unlimited', with an 'Edit...' button. A slider for cache size ranges from 25 GB to Unlimited. The 'Usage' section shows '5.58 GB used' with a 'Reset...' button. A horizontal bar chart shows the usage breakdown: 'Mac Software' (blue, ~95%), 'Other' (orange, ~5%), and a small purple segment.

**Caching** ON

---

**Access**

Status: ● Available - Devices on your local network will automatically use this service  
[Learn about configuring this service](#)

Permissions: All Networks Edit...

**Settings**

Volume: Data Edit...

Cache Size: Unlimited

25 GB 250 GB 500 GB 750 GB Unlimited

**Usage**

Cache Used: 5.58 GB used Reset...

Mac Software Other



# Caching in non-NAT networks

The screenshot shows a 'Caching' configuration window. At the top, there's a title bar with a download icon and the text 'Caching' and 'Configure how devices use this caching server.' To the right of the window is a toggle switch labeled 'ON'. Below the title bar, there's a dropdown menu 'Cache content for clients connecting from:' with 'all networks' selected. Below that is a section 'Serve clients with public addresses:' with a dropdown menu showing '✓ matching this server's network' and 'on other networks'. Below this is a large empty box with the text 'Click (+) to add networks'. At the bottom left of the window is a '+ -' button and a 'Create a new network' button. At the bottom right is a 'Client Configuration...' button. At the very bottom are 'Cancel' and 'OK' buttons. In the background, there's a sidebar with 'Acces', 'Sta', 'Per', 'Settin', 'Volu', 'Cac', and '25 GB'. The main area shows a progress bar from 25 GB to 750 GB to 'Unlimited'. Below that is a 'Usage' section with 'Cache Used: 5.58 GB used' and a 'Reset...' button. At the bottom is a horizontal bar with 'Mac Software' in blue and 'Other' in orange.

**Caching**  
Configure how devices use this caching server.

Cache content for clients connecting from: all networks

Serve clients with public addresses: ✓ matching this server's network  
on other networks

Click (+) to add networks

+ -

Create a new network

Client Configuration...

Cancel OK

25 GB 750 GB Unlimited


Usage  
Cache Used: 5.58 GB used

Reset...

Mac Software Other



# Scenarios - Multiple Public IPs with Multiple Caching Servers

**Caching**  
Configure how devices use this caching server.

Cache content for clients connecting from:

Serve clients with public addresses:

My IPs (13.1.1.1 - 13.1.1.2)

+

-

Client Configuration...

Additional configuration is required for clients in the specified IP address ranges to use this caching server. Click Client Configuration to view these settings.

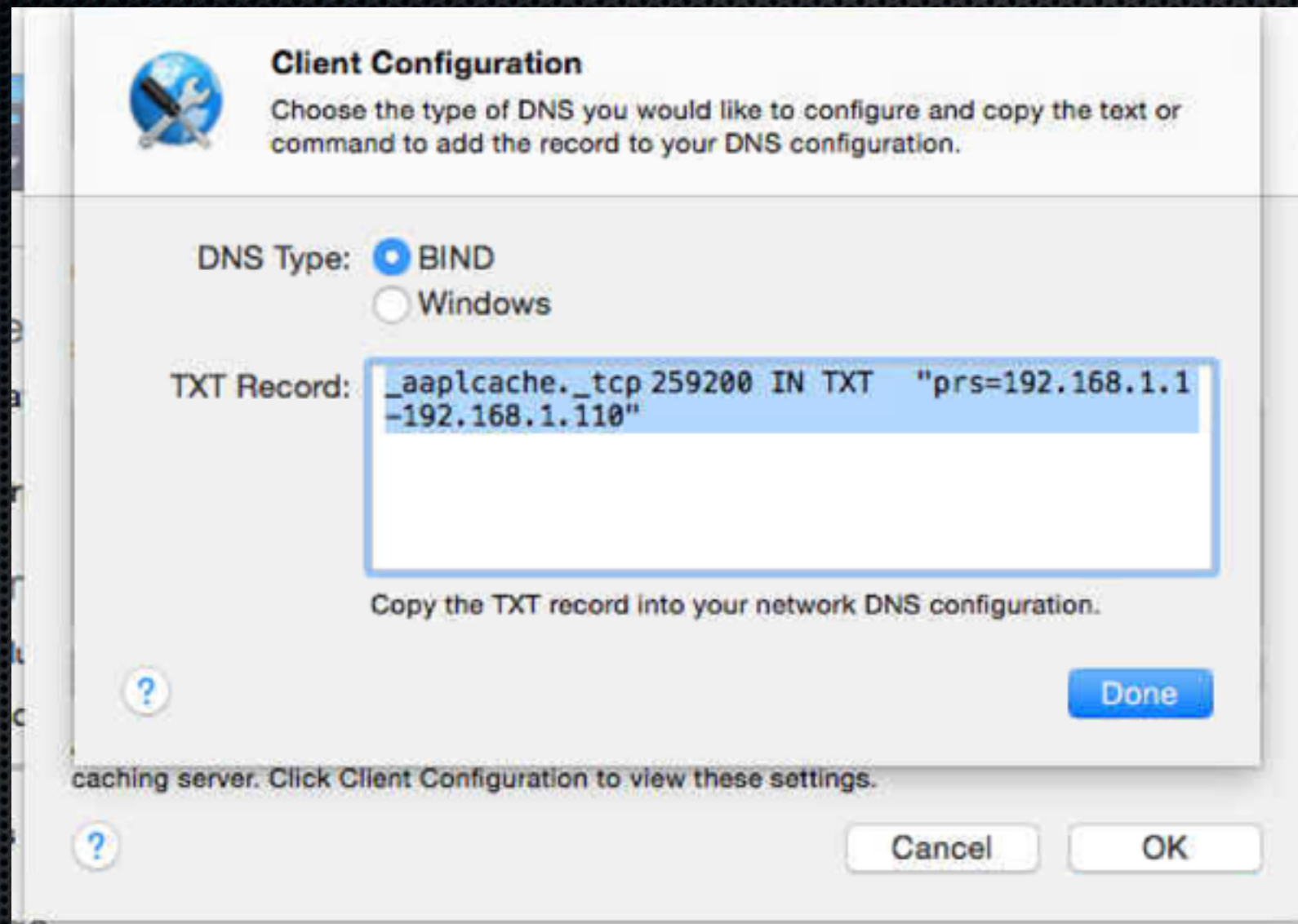
?

Cancel

OK



# Caching in non-NAT networks



**Client Configuration**

Choose the type of DNS you would like to configure and copy the text or command to add the record to your DNS configuration.

DNS Type: ☒ BIND  
☐ Windows

TXT Record: `_aaplcache._tcp 259200 IN TXT "prs=192.168.1.1-192.168.1.110"`

Copy the TXT record into your network DNS configuration.

[?](#) [Done](#)

caching server. Click Client Configuration to view these settings.

[?](#) [Cancel](#) [OK](#)



# Caching in non-NAT networks

- Configure server to use public IP address
- Configure caching service with public range of IP
- Copy TXT record from Server app
- Add TXT record to db zone file per...
  - caching.apple.com zone (Server Essentials)
    - create a www host A record
    - \_aaplcache.\_tcp.caching.apple.com TXT entry
  - your own domain zone (Advanced Server Help)
    - \_aaplcache.\_tcp.<domain name> TXT entry
  - “prs=<start IP>-<end IP>”

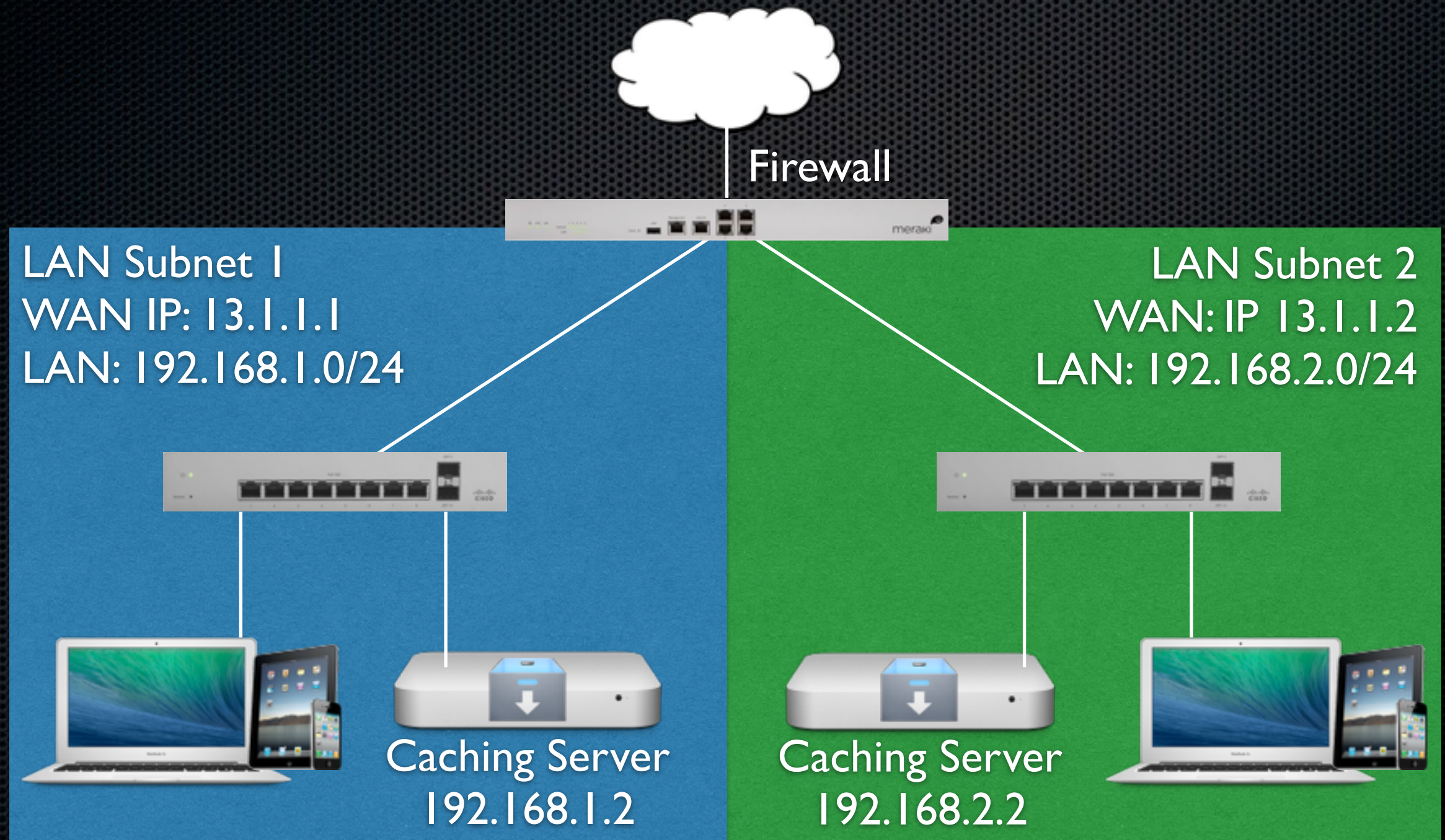


# Caching in non-NAT networks

- Copy the generated TXT record from the Client Configuration sheet.
- Open the zone file. For example, /Library/Server/named/db.example.com with your favorite editor. (vim of course)
- Paste the TXT record at the end of the configuration file. Save.



# Scenarios - Multiple Public IPs with Multiple Caching Servers





# Advanced Options - GUI

- Exposed in the GUI (easier to manage in Server app)
  - CacheLimit
  - DataPath
  - PublicRanges
  - ListenRanges
  - ListenRangesOnly
  - LocalSubnetsOnly



# Advanced Options

- `serveradmin`man serveradmin``
  - settings caching (some items are unchangeable)
  - fullstatus caching (more information than usual)
  - ``sudo serveradmin settings caching``
- `edit /Library/Server/Caching/Config/Config.plist`
  - better for setting range values
  - ``sudo serveradmin settings caching:Interface = enl``
  - `chown _assetcache:_assetcache`
  - \*If your doing this manually stop the service first



# Advanced Options

- Not available in the GUI
  - Interface
  - LogClientIdentity
  - LogLevel
  - MaxConcurrentClients
  - MaxPeersToQuery
  - OriginDownloadTimeout
  - PeerDownloadTimeout
  - PeerFilterRanges
  - PeerNotifyTimeout
  - PeerQueryTimeout
  - PeerRetryInterval
  - Port
  - ReservedVolumeSpace



# DNS -The Rules

- It's like Fight Club
- The 1st rule about DNS is , check your DNS
- The 2nd rule about DNS....check your DNS
- It's kind of a big deal.



# DNS - The Mindset

- Be Prepared: DNS is THE service that negatively or positively affects MANY things (OD, Certificates, Xsan, Profile Manager, & did I say MANY things!!)
- Plan: Decide what your IP, and DNS Hostname before you go.
- Be proactive Reserve in DHCP, if you can.



# Proper configuration of DNS

- Settle on HD name (rename it first)
- Server IP reserved in DHCP
- Set it static (even if reserved)
- FQDN and Local Host name
- Decide: What's the naming system, are there multiple servers, do you want to name based on geo location?



# DNS - The Behavior

- When you setup DNS it will automatically setup your DNS if
  - If OS X Server can't find any DNS records
  - If OS X Server can't find any reverse records
  - OS X WON'T set up DNS if it finds a reverse record



# DNS - Considerations

- Where does your DNS Live? LAN, ISP, WAN...ETC
- What about having your DNS in Windows (trust and verify)
- Verify: Host, Dig, nslookup



# DNS -.loco

- What about .local? Don't you curse at me!
- Sometimes you have to create New Zones but what about Primary and secondary? Which do i choose?



# Products

- CacheWarmer (\$4.99) by Glencode LLC - <http://blog.fraserhess.com/2014/12/introducing-cachewarmer.html>
- OS X Server Essentials 10.10 By Arek Dreyer, Ben Greisler from Pearson



# Questions?



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