

MACWORLD BOSTON 20005

P 214

# MAC OS X SERVER WEB SERVICES

OVERVIEW, HIGHLIGHTS, IN DEPTH AND  
LESSONS LEARNED

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# WEB SERVICES COVERED

- ✻ DNS (Domain Name Service)
- ✻ FTP (File Transport Protocol)
- ✻ WebDAV (Web-based Distributed Authoring and Versioning)
- ✻ rsync (Remote Sync)
- ✻ Subversion (Version Control System)
- ✻ HTTP (Hyper Text Transport Protocol)
- ✻ PHP (PHP: Hypertext Processor)
- ✻ Databases (MySQL and PostgreSQL)
- ✻ Postfix (Simple Mail Transport Protocol)



# MAC OS X SERVER

- ☼ Server Version of Mac OS X
- ☼ Web Enabled OS
- ☼ Unix Based
- ☼ Versions
  - ☼ Mac OS X 10.3 - Panther
  - ☼ Mac OS X 10.4 - Tiger





# INSTALLATION



- ☼ Local Installation

- ☼ Similar to Installing Mac OS X

- ☼ Remote/Headless Installation

- ☼ `sa_srchr`, `ssh`, `diskutil`, `installer`

- ☼ Apple Remote Desktop



# ADMIN TOOLS

**Mac OS X Server Assistant - Destination**

The Mac OS X Server use the table below to select the server that is not in use. You also need to supply the IP address of the server.

Apply	IP Address
<input checked="" type="checkbox"/>	69.44.168.226

**Server Monitor**

Choose a server to monitor:

Name	IP Address	Status Summary
beetle	beetle.rbma.com	[Icons]
echo	echo	[Icons]
foxtrot	foxtrot	[Icons]

**Remote Desktop**

Name	Current Application	Current User	Current Status	IP Address
beetle	Login Window	-	Available	69....4.22
echo	Finder	admin	Available	69.4....234
foxtrot	Login Window	-	Available	69.4....235
sarge	Terminal	admin	Available	69....4.23
titanium	-	-	Offline	192....222

**Server Admin: echo:Server**

System Version: Mac OS X 10.4.11  
Server Version: Mac OS X Server 10.4.11  
Computer Name: echo  
Local Hostname: echo.local  
Default AppleTalk Zone: Unspecified  
License Type: Unlimited-client

System Start Time: Monday, 30 May 2005 17:34

**Workgroup Manager: echo.siteservices.net**

Authenticated as fharvell to directory: /LDAPv3/127.0.0.1

Search: adm

Name	ID
Administrator	501
System Administrator	0

**User Administration: Administrator**

Name: Administrator  
User ID: 501  
Short Names: admin

Password: .....  
Verify: .....

User can:  
 administer the server  
 administer this directory domain (Privileges...)  
 access account

Account Summary:  
Location: echo.siteservices.net/LDAPv3/127.0.0.1  
Home: /Users/admin  
Primary Group: Users (20)  
Mail: No mail service for this user  
Print Quota: None  
Password: Open Directory

Presets: None



# CONFIGURATION CHANGES

- ☼ Limit Configuration Until In Final Location
- ☼ `networksetup`
- ☼ `change_ip`
- ☼ `sysctl.conf*`

\*Note: May need to comment out sysctls in `/etc/rc`.



# PARTITIONING

- ✻ Unix (multiple partitions):
  - ✻ /usr (may be mounted read only)
  - ✻ /usr/local (local applications)
  - ✻ /tmp (don't need to back up)
  - ✻ /opt (optional/compiled applications)
  - ✻ /home (user home directories)
- ✻ Mac OS X (single partition):
  - ✻ Software RAID only allows one partition
  - ✻ System is spread across directories
  - ✻ /Users (user home directories)



# USER GROUP

- ✻ What Is a User Group
- ✻ Why Use Them
- ✻ System Preferences:
  - ✻ User Group Standard In System Preferences
- ✻ Workgroup Manager:
  - ✻ Create New User Group Before User
  - ✻ Assign New User Primary Group Before Saving

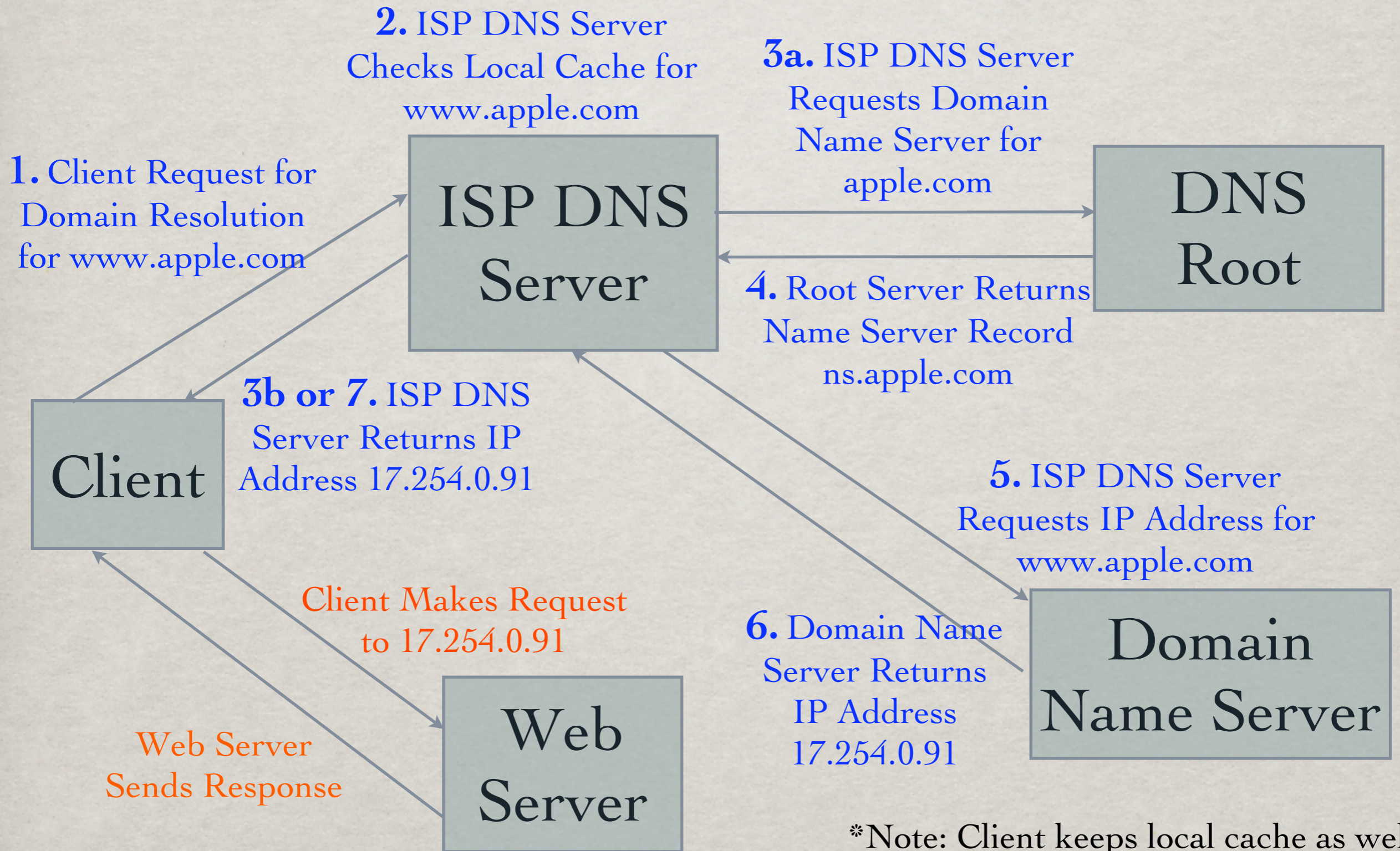


# DNS

- ☼ Converts Domain Names into IP Addresses
- ☼ ISC BIND (Berkeley Internet Name Daemon)
- ☼ `named`
- ☼ Forward Name Resolution (Name to IP)
- ☼ Reverse Name Resolution (IP to Name)
- ☼ `whois`, `dig`, `ping`, `telnet`



# HOW DNS WORKS



\*Note: Client keeps local cache as well.



# DNS CONFIGURATION

- ✻ Using Server Admin:

- ✻ OK for Simple Tasks

- ✻ Direct Editing Files:

- ✻ `/etc/named.conf`

- ✻ `/var/named/<domain.name.zone>`



# BIND CONFIGURATION

## /ETC/NAMED.CONF

```
zone "localhost" IN {
    type master;
    file "localhost.zone";
    allow-update { none; };
};

zone "0.0.127.in-addr.arpa" IN {
    type master;
    file "named.local";
    allow-update { none; };
};

zone "168.44.69.in-addr.arpa" IN {
    type master;
    file "168.44.69.in-addr.arpa.zone";
};

zone "siteservices.net" in {
    type master;
    file "siteservices.net.zone";
};
```



# ZONE FILES

/VAR/NAMED/<DOMAIN.NAME>.ZONE

```
@           IN SOA      ns1.siteservices.net. dns-admin.siteservices.net. (
2005030900 ; serial
28800      ; refresh every 8 hours
14400      ; retry every 4 hours
3600000    ; expire 1000 hours
86400      ; minimum 24 hours
)

           IN NS      ns1.siteservices.net.
           IN NS      ns2.siteservices.net.
           IN MX     100 mx.siteservices.net.
           IN MX     10 mailhost

           IN A      69.44.168.161
www        IN A      69.44.168.161
secure    IN A      69.44.168.161
ftp       IN A      69.44.168.161
mailhost  IN A      69.44.168.226
webmail   IN CNAME   webmail.siteservices.net.
imap      IN CNAME   imap.siteservices.net.
pop3      IN CNAME   pop3.siteservices.net.
smtp      IN CNAME   smtp.siteservices.net.

localhost IN A      127.0.0.1
```



# DNS ISSUES

- ☼ Caching (Delayed Propagation of Changes)
- ☼ Serial Number (SOA Record)
- ☼ Reverse DNS (Typically Provided By ISP)

```
168.44.69.in-addr.arpa.  IN NS    ns.siteservices.net.  
161                    IN PTR  www.siteservices.net.
```

- ☼ DNS TCP and UDP Port: 53



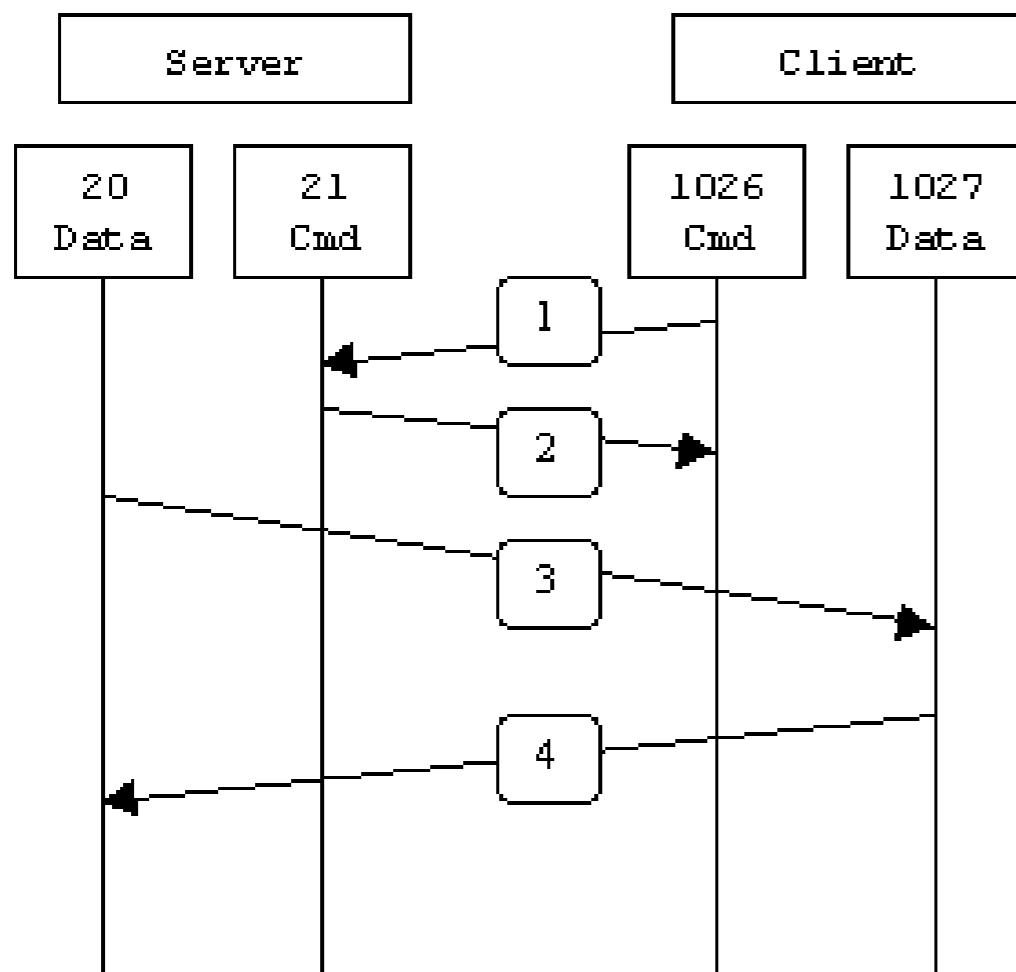
# FTP

- ☼ File Transfer Protocol
- ☼ Early, Widespread Protocol to Transfer Files
- ☼ Mac OS X Server Provides Secure Server
- ☼ SFTP (FTP Like Protocol Over SSH)
- ☼ Command Line Client
- ☼ Graphical Clients

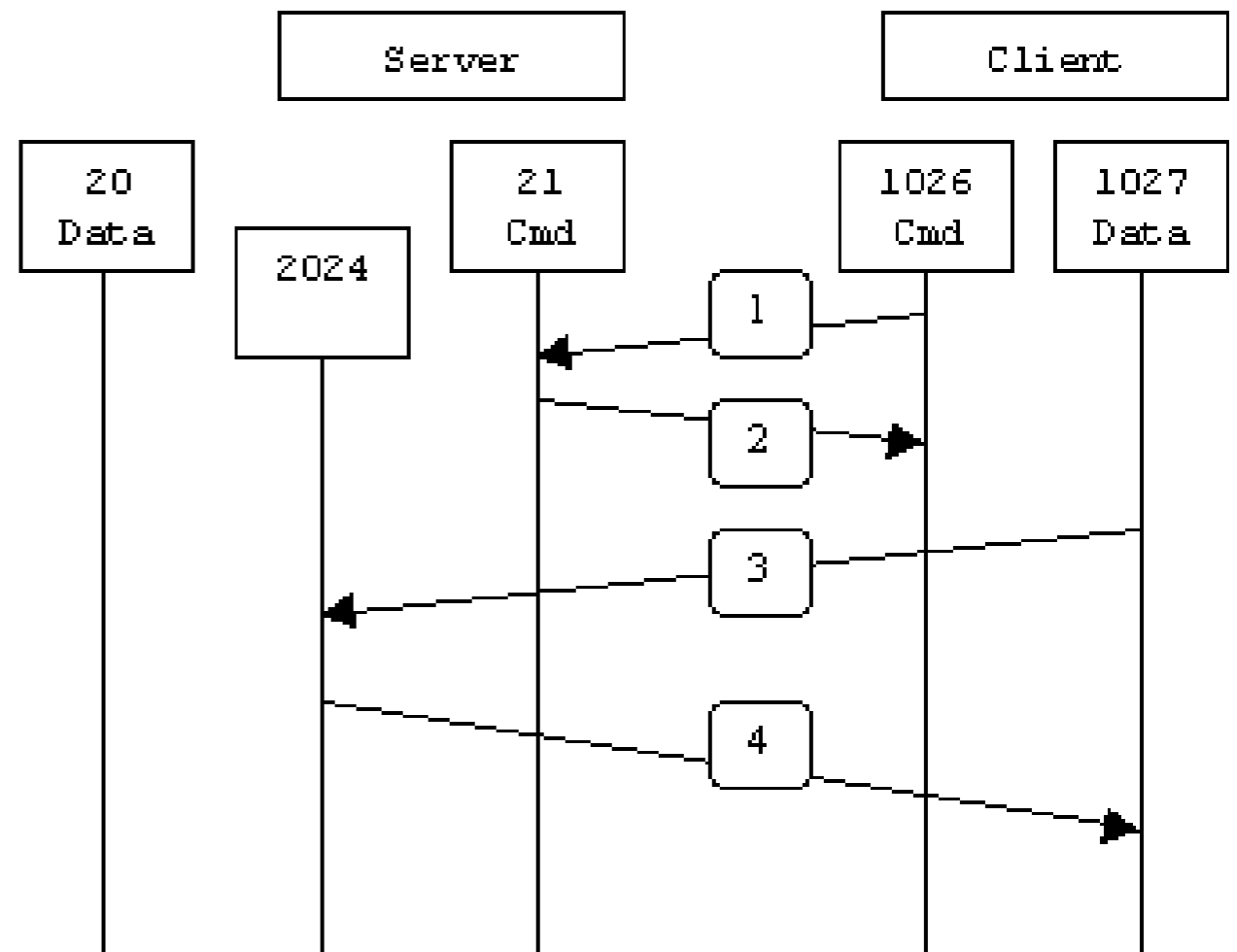


# ACTIVE VS. PASSIVE FTP

## Active



## Passive





# XFTPD

- ✻ `xftpd` (via `launchd`)
- ✻ Managed by Server Admin
- ✻ `ftpassess` (configuration file)



# FTPACCESS

## /LIBRARY/FTPSERVER/CONFIGURATION/FTPACCESS

```
class          anonusers          anonymous  *

limit          realusers           50        Any /Library/FTPServer/Messages/limit.txt
limit          anonusers            50        Any /Library/FTPServer/Messages/limit.txt

defrootdir    /Library/FTPServer/FTPRoot
auth_level    both
chroot_type   standard
keepalive     yes

loginfails    3

passwd-check  rfc822    warn

chmod         no          anonymous
delete        no          anonymous
overwrite     no          anonymous
rename        no          anonymous
umask         no          anonymous

upload        /Library/FTPServer/FTPRoot /uploads yes ftp daemon 0666 nodirs
upload        /Library/FTPServer/FTPRoot /uploads/mkdirs yes ftp daemon 0666 dirs
0777

anonymous-root /Library/FTPServer/FTPRoot
anonFTP yes
```



# SFTP

- ✻ Secure FTP
- ✻ Subsystem for Secure Shell (ssh)
- ✻ Configuration in `/etc/sshd_config`
- ✻ Firewall TCP Port 22.
- ✻ `sftp`
- ✻ Fugu\*

\*<http://rsug.itd.umich.edu/software/fugu/>



# FTP FIREWALL CONFIG

## ☼ Active FTP TCP Ports

- ☼ FTP server's port 21 from any (Client initiates connection)
- ☼ FTP server's port 21 to ports > 1024 (Server responds to client's control port)
- ☼ FTP server's port 20 to ports > 1024 (Server initiates connection to client's port)
- ☼ FTP server's port 20 from ports > 1024 (Client sends ACKs to server's port)

## ☼ Passive FTP TCP Ports

- ☼ FTP server's port 21 from any (Client initiates connection)
- ☼ FTP server's port 21 to ports > 1024 (Server responds to client's control port)
- ☼ FTP server's ports > 1024 from any (Client connection to port specified by server)
- ☼ FTP server's ports > 1024 to ports > 1024 (Server ACKs and data to client)

## ☼ SFTP TCP Port

- ☼ SFTP server's port 22 from anywhere



# WEBDAV

- ✻ Web Based Distributed Authoring and Versioning
- ✻ Used to Update Website Files
- ✻ Provides File Services
- ✻ Uses HTTP (TCP Port 80)
- ✻ Enabled via Server Admin
- ✻ Enabled in Apache Configuration File
- ✻ Minimal Security (Files Owned/Writable by www)



# RSYNC

- ✻ Remote Sync
- ✻ Fast Updates (Only Changed Files)
- ✻ Can Synchronize Directory Trees
- ✻ Requires Full Tree on Source and Target Systems
- ✻ Useful in Sandbox Development



# RSYNCD

- ✱ `rsyncd` (via `launchd`)
- ✱ Not Managed by System Admin
- ✱ Requires TCP Port 873 (or via ssh)
- ✱ `rsyncd.conf`
- ✱ `rsyncd.secrets`



# RSYNCD CONFIGURATION

## `/etc/rsyncd.conf`

```
secrets file = /etc/rsyncd.secrets

[king2]
    path = /Volumes/Users/king2
    auth users = king2
    uid = king2
    gid = king2
    read only = no
    list = no
```

## `/etc/rsyncd.secrets`

```
king2:kingxfer
dink:dinkxfer
rbma2:testxfer
```



# ENABLING RSYNC

`/LIBRARY/LAUNCHDAEMONS/ORG.SAMBA.RSYNC.PLIST`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple Computer//DTD PLIST
1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Label</key>
  <string>org.samba.rsync</string>
  <key>Program</key>
  <string>/usr/bin/rsync</string>
  <key>ProgramArguments</key>
  <array>
    <string>rsync</string>
    <string>--daemon</string>
  </array>
  <key>Sockets</key>
  <dict>
    <key>Listeners</key>
    <dict>
      <key>SockPassive</key>
      <true/>
      <key>SockServiceName</key>
      <string>rsync</string>
      <key>SockType</key>
      <string>SOCK_STREAM</string>
    </dict>
  </dict>
  <key>inetdCompatibility</key>
  <dict>
    <key>Wait</key>
    <false/>
  </dict>
</dict>
</plist>
```

## Mac OS X 10.3 `/etc/xinetd.d/rsync`

```
service rsync
{
    disable = no
    instances = 50
    socket_type = stream
    wait = no
    user = root
    server = /usr/bin/rsync
    server_args = --daemon
    log_on_failure += USERID
}
```



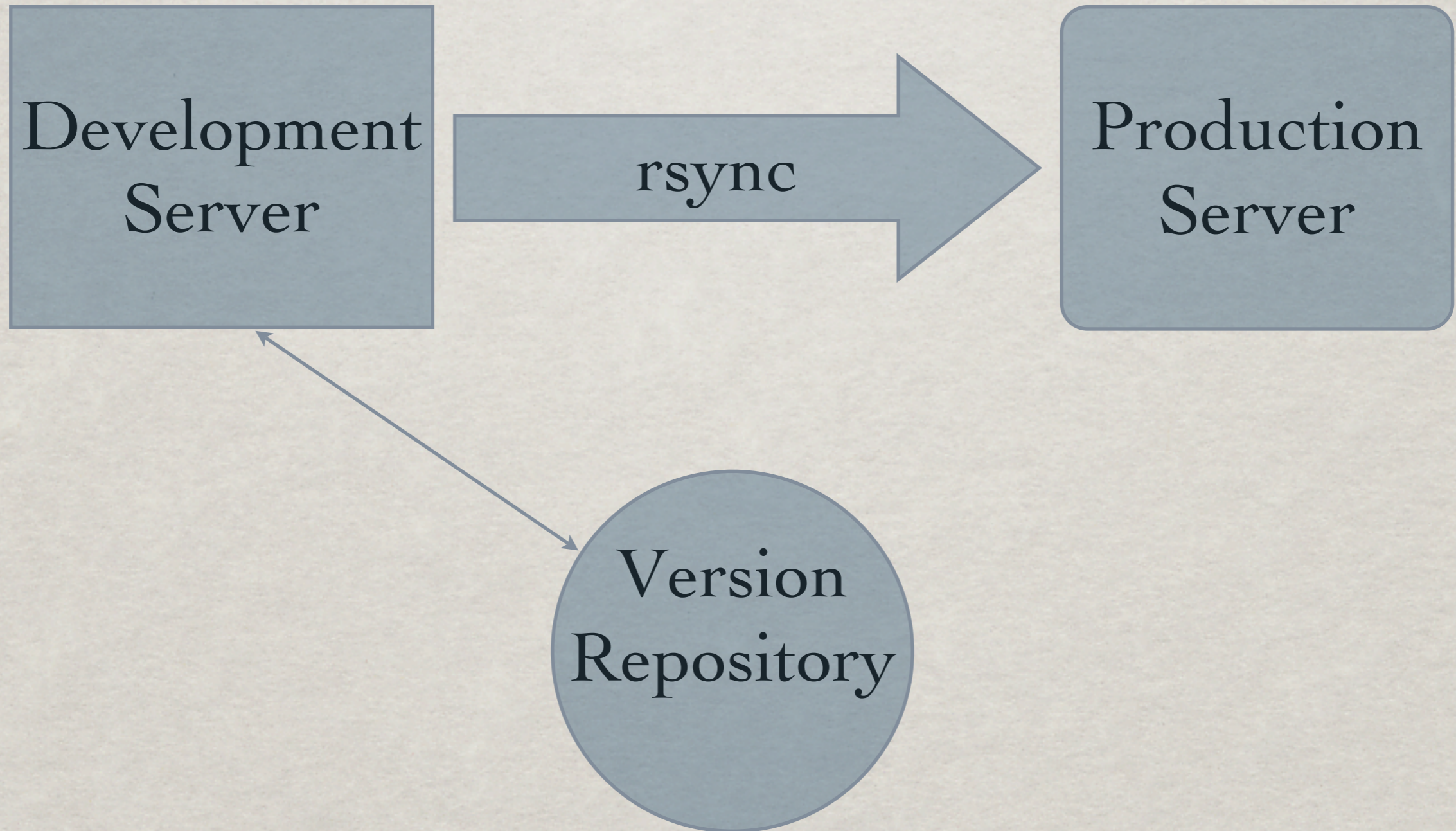
# SUBVERSION\*

- ☼ Version Control System
- ☼ Replacement for CVS (Concurrent Versions System)
- ☼ Supports Development Sandboxes
- ☼ Alternative: CVS, ClearCase, Perforce, etc.

\*<http://subversion.tigris.org/>



# SANDBOX DEVELOPMENT





# SVNSERVER

- ✻ Download and Install Package\*
- ✻ `svnserver` (via `launchd`)
- ✻ Not Managed by System Admin
- ✻ Requires TCP Port 3690
- ✻ (or `svn+ssh` via `ssh`)

\*<http://subversion.tigris.org/>



# SUBVERSION REPOSITORY

- ✻ Use Workgroup Manager:
  - ✻ Add svn Group
  - ✻ Add svn User (Using svn Group)
  - ✻ Add Subversion Admin User to svn Group
  
- ✻ Log On as svn (Creating Home Directory)
  
- ✻ In Terminal:

```
umask 002
export PATH="/usr/local/bin:$PATH"
svnadmin create Repository
```



# SVNSERVER CONFIGURATION

## Repository/conf/svnserve.conf

```
[general]  
anon-access = none  
auth-access = write  
password-db = passwd  
realm = siteservices.net, Inc.
```

## Repository/conf/passwd

```
[users]  
fharvell = a_good_pwd  
thunt = a_better_pwd
```



# ENABLING SVN SERVER

/LIBRARY/LAUNCHDAEMONS/ORG.TIGRIS.SUBVERSION.PLIST

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple Computer//DTD PLIST
1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Label</key>
  <string>org.tigris.subversion</string>
  <key>Program</key>
  <string>/usr/local/bin/svnserve</string>
  <key>ProgramArguments</key>
  <array>
    <string>svnserve</string>
    <string>-i </string>
    <string>-r</string>
    <string>/Users/svn/Repository</string>
  </array>
  <key>Sockets</key>
  <dict>
    <key>Listeners</key>
    <dict>
      <key>SockPassive</key>
      <true/>
      <key>SockServiceName</key>
      <string>svn</string>
      <key>SockType</key>
      <string>SOCK_STREAM</string>
    </dict>
  </dict>
</plist>
```

```
<key>inetdCompatibility</key>
<dict>
  <key>Wait</key>
  <false/>
</dict>
<key>UserName</key>
<string>svn</string>
<key>GroupName</key>
<string>svn</string>
</dict>
</plist>
```

**Mac OS X 10.3**  
**/etc/xinetd.d/svn**

```
service svn
{
  socket_type = stream
  protocol   = tcp
  wait       = no
  user       = svn
  server     = /usr/local/bin/svnserve
  server_args = -i -r /Users/svn/Repository
}
```



# HTTP

- ✻ Hyper Text Transfer Protocol
- ✻ Provides Access to Websites
- ✻ Apache Server (1.3 and 2.0 provided)
- ✻ Widespread Clients (Browsers)
- ✻ Supports Many Dynamic Content Modules
- ✻ Base Transport Application for WebDAV, PHP, JBoss, WebObjects and More



# APACHE CONFIGURATION

- ✻ httpd
- ✻ Using Server Admin:
  - ✻ OK for Basic Websites
- ✻ Direct Editing Files:
  - ✻ `/etc/httpd/httpd.conf`
  - ✻ `/etc/httpd/sites/*.conf`



# APACHE CONFIGURATION FILES

- ✻ Configuration Split into Multiple Files

- ✻ Optional Application Config Files

`http_mailman.conf, http_squirrelmail.conf`

- ✻ Individual Virtual Host Files:

`0000_any_80_.conf`

`0000_69.44.168.235_80_www.siteservices.net.conf`



# DEFAULT SITE CONFIG

```
<VirtualHost 69.44.168.234:16080>
  ServerName our.siteservices.net
  ServerAdmin webmaster@siteservices.net
  DocumentRoot "/Library/WebServer/Documents"
  DirectoryIndex "index.html" "index.php"
  CustomLog "|/usr/sbin/rotatelogs "/var/log/httpd/access_log" 604800' "%{PC-Remote-Addr}i %l %u %t \"%r\" %>s %b"
  ErrorLog "|/usr/sbin/rotatelogs "/var/log/httpd/error_log" 604800'
  ErrorDocument 404 /error.html
  <IfModule mod_ssl.c>
    SSLEngine Off
    SSLLog "/var/log/httpd/ssl_engine_log"
    SSLCertificateFile "/etc/certificates/Default.crt"
    SSLCertificateKeyFile "/etc/certificates/Default.key"
    SSLCipherSuite "ALL:!ADH:RC4+RSA:+HIGH:+MEDIUM:+LOW:!SSLv2:+EXP:+eNULL"
  </IfModule>
  <IfModule mod_dav.c>
    DAVLockDB "/var/run/davlocks/.davlock100"
    DAVMinTimeout 600
  </IfModule>
  <Directory "/Library/WebServer/Documents">
    Options All +Indexes +ExecCGI +Includes +MultiViews
    AllowOverride None
    <IfModule mod_dav.c>
      DAV On
    </IfModule>
  </Directory>
  <IfModule mod_rewrite.c>
    RewriteEngine On
    RewriteCond %{REQUEST_METHOD} ^TRACE
    RewriteRule .* - [F]
  </IfModule>
  <IfModule mod_alias.c>
  </IfModule>
  LogLevel warn
</VirtualHost>
```



# APACHE LOG ANALYSIS

- ☼ Multiple Tools Available
- ☼ Wusage\*
- ☼ Robust Reports
- ☼ Online Mode
- ☼ Command Line
- ☼ usertrack\_module
- ☼ Log Rotation

Month of 2005-5-1 to 2005-5-31

http://www.kingfeatures.com/stats/wusage/monthly/2005/05/01

Address Book News (1185) Apple IT Pro .Mac Mac Rumors MacNN CNET XOXO Apple (88)

## Month of 2005-5-1 to 2005-5-31

### Important Totals

Item	Accesses	Bytes	Visits	Charts
All Files Served	14,185,473	26,754,453,877	295,880	<a href="#">View Chart</a>
Page Views	5,110,666	15,938,772,202	295,299	<a href="#">View Chart</a>
Unique Visitors (Best Method)	97,690			<a href="#">View Chart</a>
Home Page Views	24,450	443,400,072	9,967	<a href="#">View Chart</a>

### Executive Summary

97,690 unique visitors came to the site, as determined by typical behavior of browsers with a non-rotating IP address and including a projection of the true number of visitors with rotating IP addresses.

The web site received 295,880 visits. A typical visitor examined 34.59 distinct files before leaving the site. A typical visit lasted for 5.32 minutes. The longest visit lasted for 1,192 minutes.

The web server was visited by 328 distinct users accepting cookies, as determined by individual user-identifying "cookies" received at least twice.

Visitors came from 107,812 distinct Internet addresses.

The web server delivered 10,100 unique documents one or more times each.

77 distinct types of documents were delivered.

### Calendar of Reports

- Individual Reports
- [Executive Summary and Totals](#)
- [Accesses by Hour](#)
- [Accesses by Day](#)
- [Top Documents](#)
- [Top Entry Pages](#)  
Visits typically began at these pages.
- [Top Exit Pages](#)  
Visits typically ended at these pages.
- [Documents by Directory](#)
- [File Types \(Extensions\)](#)
- [Authorized Users](#)
- [Top Visitor Sites](#)
- [Top Visitor Domains](#)
- [Top Users](#)  
as Determined by Cookies
- [Top Proxy Sites](#)
- [Top Proxy Domains](#)
- [Top Web Browsers](#)  
Also known as "user agents"
- [Top Operating Systems](#)  
Operating systems used by visitors
- [Screen Resolution and Depth \(Colors\)](#)  
Screen size and simultaneous colors available on visiting computers
- [Top Referring URLs](#)

\*<http://www.boutell.com/wusage/>



# APACHE LOG USER TRACKING

- ✻ Provides an Ability to Track Number of Unique Users
- ✻ Provides an Ability to Track Website Navigation Paths

- ✻ Apache usertrack\_module

```
LoadModule usertrack_module
```

```
    libexec/httpd/mod_usertrack.so
```

```
AddModule mod_usertrack.c
```

```
CookieTracking on
```

```
CustomLog '|/usr/sbin/rotatelogs
```

```
    "/var/log/httpd/access_log" 604800' "\"%h %l
```

```
%u %t \\\\"%r\\\" %>s %b %v \\\\"%{Referer}i\\\"
```

```
\\\"%{User-Agent}i\\\" \\\\"%{Cookie}n\\\"\"
```



# APACHE FIREWALL CONFIG

- ☼ Standard Ports:

- ☼ TCP Port 80 - http://

- ☼ TCP Port 443 - https://

- ☼ Apple Ports:

- ☼ TCP Port 16080 - Performance Cache



# PHP

- ☼ PHP: Hypertext Processor
- ☼ Programming Language embedded in HTML
- ☼ Large Access to Dynamic Content Sources  
(Apple Default: LDAP, Kerberos, cli, zlib, trans-sid, XML, EXIF, FTP, mbstring, mbregex, dbx, Sockets, IODBC, CURL, MySQL)
- ☼ Extensive Documentation: [www.php.net](http://www.php.net)



# EXAMPLE APPLICATION

## index.php

```
<?php require_once process.php; ?>
<html>
<head><title>Website Signup</title></head>

<body>
<h1>Website Signup</h1>
<div id="form">
  <h2>Sign Up</h2>
  <?php if ($error) { echo '<div class="error">', $error, '</div>'; } ?>

  <form action="<?php echo $_SERVER['PHP_SELF']; ?>" method="post">
    <fieldset>
      <legend>Name</legend>
      <label for="form[first_name]">First Name</label>
      <input type="text" name="form[firstname]"
        value="<?php echo $form['firstname']; ?>" />
      <label for="form[last_name]">Last Name</label>
      <input type="text" name="form[lastname]"
        value="<?php echo $form['lastname']; ?>" />
    </fieldset>
    <input type="submit" name="op" value="Submit" />
  </form>

</div>
</body>
</html>
```



# EXAMPLE APPLICATION

## process.php

```
<?php
// get passed variables
$op = $_REQUEST['op']; $form = $_REQUEST['form'];

// connect to database
$db = pg_pconnect('dbname=mydb user=dbuser password=dbpwd');

// check for submit
if ('Submit' == $op) {
    // check for required data
    if (empty($form['firstname'])) { $error .= 'First Name is required.<br />'; }
    if (empty($form['lastname'])) { $error .= 'Last Name is required.<br />'; }

    if (empty($error)) {
        // insert data into database
        $result = pg_query("INSERT INTO wuser (firstname, lastname) VALUES ('" .
$form['firstname'] . "', '" . str_replace("'", "''", $form['lastname']) . "')");

        if ($result) { unset($form); } // clear form data if insert ok
    }
}
?>
```



# PHP CONFIGURATION

## /etc/php.ini

```
include_path "./opt/fts:/usr/local/lib/php"  
auto_prepend_file lib/dev/pre.php  
auto_append_file lib/dev/post.php  
magic_quotes_gpc Off  
magic_quotes_runtime Off  
magic_quotes_sybase Off  
register_globals Off  
session.use_trans_sid On
```

## /etc/http/sites/\*.conf

```
<IfModule mod_php4.c>  
  php_value include_path "./opt/fts:/usr/local/lib/php"  
  php_value auto_prepend_file lib/dev/pre.php  
  php_value auto_append_file lib/dev/post.php  
  php_value magic_quotes_gpc Off  
  php_value magic_quotes_runtime Off  
  php_value magic_quotes_sybase Off  
  php_value register_globals Off  
  php_value session.use_trans_sid On  
</IfModule>
```



# BUILDING PHP

- ✻ Necessary to Access PostgreSQL
- ✻ Necessary for Many Other Modules
- ✻ Download, `configure`, `make`, `make install`
- ✻ `./configure --prefix=/usr/local/php --with-config-file-path=/usr/local/php/lib --with-apxs --with-openssl=/usr --with-zlib=/usr --with-mysql --with-pgsql --enable-cgi --with-ldap --with-xml --with-iodbc=/usr --enable-sockets --enable-dbx --enable-dbase --enable-trans-sid --enable-exif --enable-wddx --enable-ftp --enable-mbstring --enable-shsvmsg --enable-sysvsem --enable-sysvshm --with-curl --enable-mcrypt --enable-memory-limit`
- ✻ Copy `libphp4.so` to `/usr/libexec/httpd/libphp4.so`



# ZEND\* ENHANCEMENTS

- ☼ Zend Optimizer - Free tool that optimizes the execution of PHP applications.
- ☼ Zend Platform - Product that provides a code accelerator, database cache, and more.
- ☼ Zend Studio - Product that provide a robust IDE and debug tools and has been integrated with the Zend Platform.

\*<http://www.zend.com>



# FTSUTIL LIBRARY\*

- ☼ PHP Library
- ☼ Facilitates the Development of Scalable, Robust Website Applications
- ☼ Provides “Automagic” Database Forms
- ☼ Provides Multiple Content Modules
- ☼ Provides Embedded Debugging and Production Error Identification Support

\*<http://www.firsttimesoftware.com/ftsutil/>



# DATABASES

- ✻ MySQL

- ✻ Popular

- ✻ Included in Mac OS X Server

- ✻ Lacks Advanced Relational Features

- ✻ PostgreSQL

- ✻ Popular

- ✻ Not included in Mac OS X Server

- ✻ Includes Advanced Relational Features



# POSTFIX

- ✻ High Performance Mail Transport Agent
- ✻ Integrated with SpamAssassin and ClamAV
- ✻ Integrated into Apple Administration Tools
- ✻ Firewall TCP Port 25
- ✻ Client Access Through Cyrus IMAP
- ✻ DNS: MX Records, Reverse DNS



# ADDITIONAL WEB SERVICES IN TIGER

- ✻ iChat Server (Jabber)
- ✻ JBoss Application Server
- ✻ QuickTime Streaming Server
- ✻ Weblog Server (Blojsom)
- ✻ WebObjects



# ADDITIONAL NETWORK SERVICES IN TIGER

- ✻ AFP, Samba, NFS (File Services)
- ✻ CUPS (Print Services)
- ✻ Open Directory Server (LDAP, Kerberos)
- ✻ Software Update Server
- ✻ Xgrid



# CONCLUSION

- ✻ Mac OS X Server Provides a Robust Web Services Platform
- ✻ Unix Base Supports Large Infrastructure
- ✻ Admin Tools are Incomplete/Inflexible
- ✻ Virtual Memory Leak



# THANK YOU

## Q & A



F Harvell

I have over 20 years experience with Unix and Unix like systems and have been working with the Internet since 1988. I have worked as a programmer, systems administrator, systems analyst, web developer and development manager and consultant on many projects with widely varying needs.



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