

CYBR 4423

Unix/Linux Administration

LAMP service

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Introduction

LAMP

Linux

Apache HTTP Server

PHP

MySQL + phpmyadmin

Apache HTTP Server

Web (HTTP) server

Web servers process requests and responses base on the HTTP (hypertext transmission protocol, which is based on TCP/IP)

Apache HTTP Server (or just Apache) is a project from the Apache Software Foundation

Most popular web server followed by Microsoft's IIS

[Exploring 8chan's hosting infrastructure](#)

[Web Server Survey](#)

Apache Software Foundation

ASF provides support for the Apache community of open-source software projects.

[Apache](#)

The ASF is made up of nearly 100 top level projects that cover a wide range of technologies.

HTTP Server

Tomcat

Subversion

[Project Directory](#)

Installation Options

Command line

`apt-get install apache2`

Gnome GUI

Search “apache2” (Apache HTTP Server metapackage) in the Synaptic package manager

Built from source

Download Apache 2

[Download Apache HTTP Server](#)

From command line

`wget www.apache.org/dist/httpd/httpd-2.2.21.tar.gz`

Read the installation guide to extract, configure, compile and install

[Compiling and Installing 2.2](#), or

[Compiling and Installing 2.0](#)

Verify Installation

Check Apache version

`apache2 -v`

Starting and shutting down Apache2

Use the “service” command

`service apache2 start/stop/restart`

Use “apache2ctl” utility

`apache2ctl start/stop`

Use the following command to check if Apache2 is running

`service apache2 status`

View the default webpage

Open a local browser and enter the address: "http://localhost", or

If on the network, on another computer, open a browser and enter the Linux machine's IP as the address



Apache Terms

Directive

- A particular setting or configuration item

Virtual host

- A website setup on the same server
- A server can have multiple sites (virtual hosts)

Document root

- The root directory of a website

Directory index

- The default page of a directory if not requested specifically

Alias

- A name for another (any) directory

Apache2's Major Directories

Directory	Description	Memo
/etc/apache2/	all configuration files	Contains apache2.conf, httpd.conf, ports.conf, mods-enabled, sites-enabled, etc.
/var/www/	document root By default	
/usr/lib/apache2/	Apache library files	Contains main programs files and modules
/usr/sbin/	utility tools	Contains apache2ctl, a2enmod, a2dismod, a2ensite, a2dissite
/var/log/apache2/	all log files	Includes access.log and error.log
/usr/lib/cgi-bin/	holds CGI scripts.	
/usr/share/apache2/error /	holds default error documents.	You can modify these documents to conform to the style of your Web site.

[For the default directories used in various Linux/Unix distros](#)



Configuration Files Summary

All Apache configuration files are kept in the **/etc/apache2** directory

apache2.conf

Primary configuration under Ubuntu. It includes other config files using Include directives.
Do not typically change this file, but put additional configurations in httpd.conf and other files.

httpd.conf

Local configuration directives. This file augments the apache2.conf file in the same directory.

ports.conf

Holds the Listen directive, which controls which IP address(es) and port(s) Apache listens on.

Envvars

Holds variables that modify the environment Apache runs in.

mods-available/*.load and mods-available/*.conf

The *.conf files configure the modules for use.
The *.load files load modules from the /usr/lib/apache2/modules directory

mods-enabled/*.load and mods-enabled/*.conf

Holds links to files in modes-available. Use a2enmod to create links and a2dismod to remove links.
Also contains the alias.conf file for URL alias definition

sites-available/

Holds files that describes virtual hosts.

sites-enabled/

Holds links to files in sites-available. Use a2ensite to create links and a2dissite to remove links.

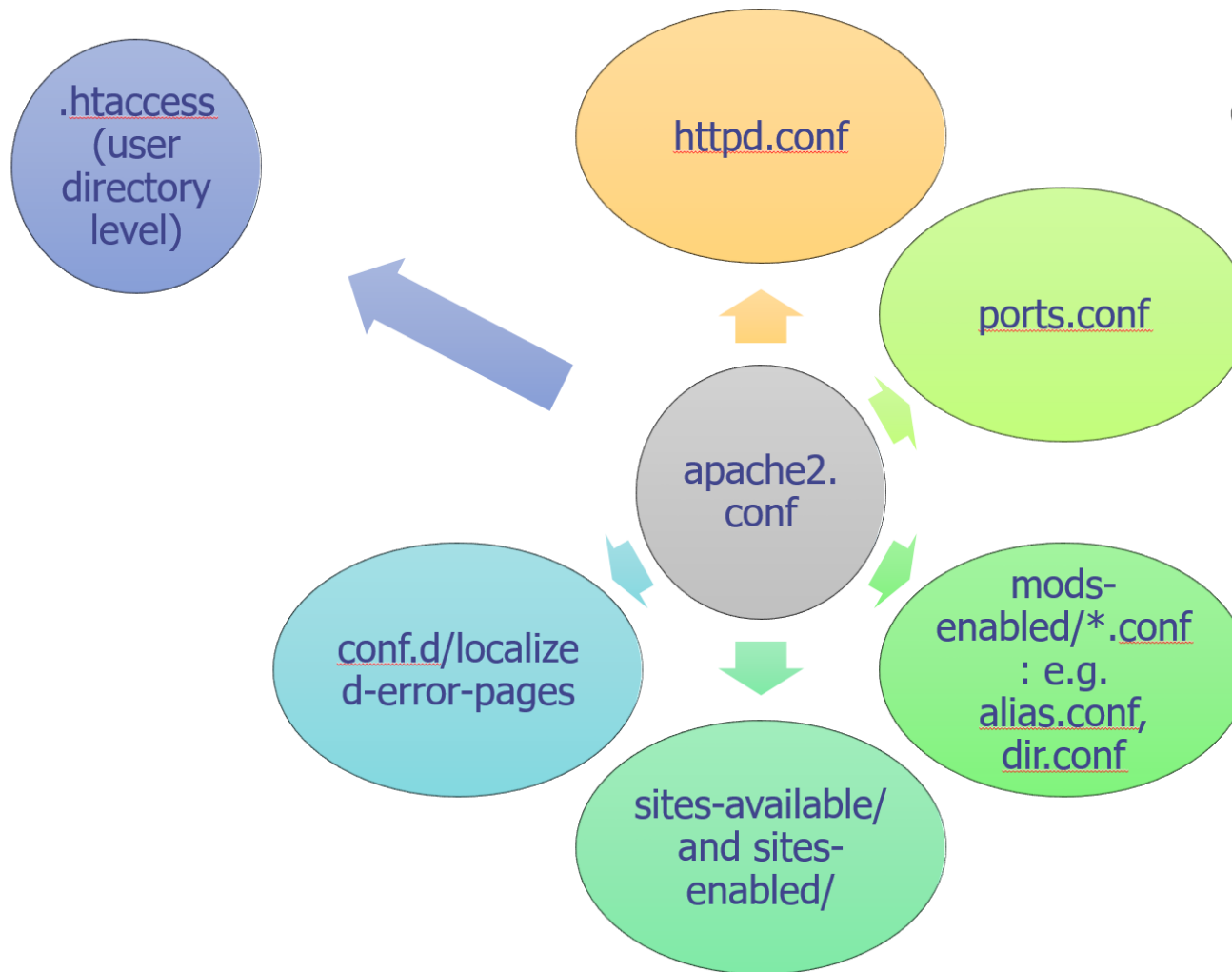
conf.d/localized-error-pages (/conf.d/ holds other types of configuration files)

This file defines the error page behaviors (for example HTTP 404 File Not Found)



Configuration Files Summary 2

All Apache configuration files are kept in the **/etc/apache2** directory



Utility Tools

These tools are in /usr/sbin/

apache2ctl

Controls the start and stop of the web server

a2enmod and a2dismod

Enable or disable a module

a2ensite and a2dissite

Enable or disable a virtual host (site)

Basic Virtual Host Settings

The files in `/etc/apache2/sites-available/` define virtual hosts (sites).

One file for one virtual host

Change website root (DocumentRoot)

Make change to the "DocumentRoot" line

Change port

Change the port number in the opening tag

Also modify the port numbers in the `/etc/apache2/ports.conf` file

Change default (index) files

Add a DirectoryIndex line, for example

DirectoryIndex index.html README.html default.html

Or change the `/etc/apache2/mods-available/dir.conf` file



Directory Listing

If no directory index file is found

mod_autoindex module will generate a listing of the directory contents (a generated web page listing all files in the directory)

This can be disabled using the Options directive; if so, then an HTTP error will be generated.

```
<Directory /var/www>  
Options -Indexes  
</Directory>
```

See

Directory Listing

User Web Sites

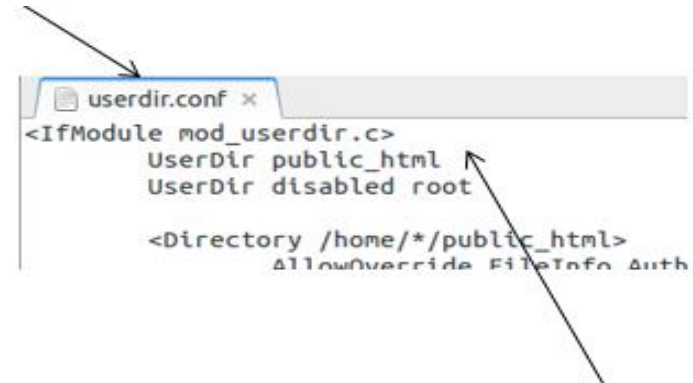
By default web site for each user is disabled

Need to enable the module "userdir"

Create 2 links in /etc/apache2/mods-enabled/ to 2 files

/etc/apache2/mods-available/userdir.conf

/etc/apache2/mods-available/userdir.load



In each user's home directory

Create a "public_html" directory and put all web pages there.

This directory is defined in the "UserDir" directive in userdir.conf

User web site address

http://[domain or IP]/~[userid]

Example: http://spsu.edu/~jzheng3

URL Alias (Virtual Directory)

URL alias is used to

- access a directory that is not in the "Document Root"
- make a long URL shorter and easy to remember

Configuration

- Modify `/etc/apache2/mods-available/alias.conf`
- Default alias: `/icons/`

The URL will be `http://{host}/icons/`

```
Alias /icons/ "/usr/share/apache2/icons/"  
  
<Directory "/usr/share/apache2/icons">  
    Options FollowSymLinks  
    AllowOverride None  
    Order allow,deny  
    Allow from all  
</Directory>
```

Custom Error Pages

Custom error pages are used to replace standard error pages like a 404 page not found error

Configuration

Modify `/etc/apache2/conf.d/localized-error-pages`

Default error pages are in `/usr/share/apache2/error/`

Log Files

`/var/log/apache2/error.log`

This where error logs are kept

Trouble shooting errors

```
tail -n 10 /var/log/apache2/error.log
```

`/var/log/apache2/access.log`

This log file contains web request history

Use log analysis (web analytics) software for access statistics and reports

PHP

PHP (HyperText Preprocessor)

A general-purpose server-side scripting language designed for web development

Most popular module used in Apache

Version

Current version 5.3 (PHP5)

PHP Mod Installation

PHP can be run as a module in the Apache's process

Installation

```
> apt-get install libapache2-mod-php5
```

Command line:

Or search "libapache2-mod-php5" in the Synaptic package manager

Restart the Apache server after installation

Verify

Examine the following files and directories to find php5

/usr/lib/apache2/modules/libphp5.so

/etc/apache2/mods-available/php5.conf and php5.load

/etc/apache2/mods-enabled/php5.conf and php5.load (links)

Rename the "index.html" file to "index.php",
and replace the content between the body tag
with the script on the right

```
<?php  
    phpinfo();  
?>
```

Browse to "http://localhost" in your browser. You should see the PHP information page.

PHP Modules

Related module files and directories

Configuration file

`/etc/apache2/mods-enabled/php5.conf`

Load module file

`/etc/apache2/mods-enabled/php5.load`

PHP5 library file for apache

`/usr/lib/apache2/modules/libphp5.so`

PHP5 libraries

`/usr/lib/php5/`

Enable/disable PHP5

`a2enmod php5`

`a2dismod php5`

Remember to restart the Apache server



PHP Configuration Files

Major configuration file "php.ini"

/etc/php5/apache2/php.ini

; is the comment symbol

Normally you will configure session, database, security, error, logging, etc.

For example: "display_errors=on" will display errors in the webpage.

Additional .ini files

/etc/php5/apache2/conf.d/

MySQL

MySQL is an open-source database server frequently used for web applications

Use the apt command to install MySQL

```
> apt-get install mysql-server
```

Use mysql terminal client on the localhost

```
> mysql -u root -p
```

Note: the password for the MySQL root account is different from the Linux root user.

phpmyadmin

phpMyAdmin is a LAMP application specifically written for administering MySQL servers.

Written in PHP, and accessed through a web browser, phpMyAdmin provides a graphical interface for database administration tasks.

Installation and configuration

[Ubuntu Server Guide](#)

Summary

Key concepts

Apache, PHP

HTTP Server, MySQL Server

Virtual host, module

Key skills

Be able to admin web sites powered by LAMP

Be able to install and configure Apache HTTP Server on Linux

Be able to install and configure PHP module for Apache HTTP Server

Be able to install and configure MySQL, and create databases using phpmyadmin

Good Readings and Resources

Installing and configuring Apache2

[Compiling and Installing](#)

[Apache HTTP Server Version 2.0 Documentation](#)

[Ubuntu Server Guide](#)

[How to Configure Apache Web Server on Linux](#)

Installing LAMP

[ApacheMySQLPHP](#)

[Installing a LAMP Server on Ubuntu](#)

mysql workbench

mysqladmin

tomcat

