cgl@www:/$ echo "Install the web server package. The version we install here is compatible with server side scripting that we will do in a later exercise."
Install the web server package. The version we install here is compatible with server side scripting that we will do in a later exercise.
cgl@www:/$
cgl@www:/$ sudo apt-get install apache2-mpm-prefork
The system comes configured with a default virtual host configuration that will receive any HTTP requests and give the default web page.
cgl@www:/$ echo "Here is the default site configuration file:
Here is the default site configuration file:
cgl@www:/$ ls -l /etc/apache2/sites-available/
total 12
-rw-r--r-- 1 root root 1332 Jan 7 2014 000-default.conf
-rw-r--r-- 1 root root 6437 Jan 7 2014 default-ssl.conf
cgl@www:/$ 
cgl@www:/$ echo "See the 000-default.conf?"
See the 000-default.conf?
cgl@www:/$
cgl@www:$ echo "The default site has a DocumentRoot configured:"
The default site has a DocumentRoot configured:
cgl@www:$ grep DocumentRoot /etc/apache2/sites-available/000-default.conf
  DocumentRoot /var/www/html
cgl@www:$
cgl@www/$ echo "If we look in that directory, we can see the default site content:" 
If we look in that directory, we can see the default site content: 
cgl@www/$ ls -l /var/www/html/ 
  total 12  
  -rw-r--r-- 1 root root 11510 Sep 17 06:24 index.html  
cgl@www/$
index.html is the file that will be sent as the response for a directory request.
cgl@www/$ echo "The index.html file has a bunch of formatting, but the basic message is there too."
The index.html file has a bunch of formatting, but the basic message is there too.
cgl@www/$ grep 'works' /var/www/html/index.html
<title>Apache2 Ubuntu Default Page: It works</title>
It works!
cgl@www/$
cgl@www:/$ echo "Finally, a demonstration that the service is working."
Finally, a demonstration that the service is working.
cgl@www:/$
Apache2 Ubuntu Default Page

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should replace this file (located at /var/www/html/index.html) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is fully documented in /usr/share/doc/apache2/README.Debian.gz. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the manual if the apache2-doc package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
 |  |-- ports.conf
```
cgl@www:/$ echo "apache keeps its own log files."
apache keeps its own log files.
cgl@www:/$ sudo ls -l /var/log/apache2/
total 8
-rw-r----- 1 root adm 603 Sep 17 06:30 access.log
-rw-r----- 1 root adm 278 Sep 17 06:24 error.log
-rw-r----- 1 root adm 0 Sep 17 06:24 other_vhosts_access.log
cgl@www:/$
cgl@www:/$ echo "access.log tracks all requests, one line each."
access.log tracks all requests, one line each.
cgl@www:/$ echo "error.log tracks all non-request information, including start/stop messages and errors."
error.log tracks all non-request information, including start/stop messages and errors.
cgl@www:/$
cgl@www:/usr/sbin/apache2/error.log
[Wed Sep 17 06:24:57.362182 2014] [mpm_event:notice] [pid 2552:tid 139743440590720] AH00489: Apache/2.4.7 (Ubuntu) configured -- resuming normal operations
cgl@www/$
cgl@www:/$ sudo cat /var/log/apache2/access.log
209.33.199.59 - - [17/Sep/2014:06:30:32 -0600] "GET / HTTP/1.1" 200 3594 "-" "Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/37.0.2062.94 Safari/537.36"
209.33.199.59 - - [17/Sep/2014:06:30:32 -0600] "GET /icons/ubuntu-logo.png HTTP/1.1" 200 3688 "http://www.dsutux.us/" "Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/37.0.2062.94 Safari/537.36"
209.33.199.59 - - [17/Sep/2014:06:30:32 -0600] "GET /favicon.ico HTTP/1.1" 404 502 "-" "Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/37.0.2062.94 Safari/537.36"
cgl@www:/$
cgl@www:/$ echo "You can check if apache is running by looking for the process, and the open ports. HTTP's default port is 80."
You can check if apache is running by looking for the process, and the open ports. HTTP's default port is 80.
cgl@www:/$
cgl@www:/$ ps aux | grep apache
root  2552  0.0  1.0  71300  2584 ?   Ss   06:24  0:00 /usr/sbin/apache
       -k start
www-data 2554  0.0  0.9  360496  2208 ?   Sl  06:24  0:00 /usr/sbin/apache
       -k start
www-data 2555  0.0  1.1  426080  2796 ?   Sl  06:24  0:00 /usr/sbin/apache
       -k start
cgl    2880  0.0  0.3  11744  900 pts/0   S+  06:34  0:00 grep --color=auto to apache
cgl@www:/$
cgl@www:/$ sudo netstat -natp
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address               Foreign Address      State
PID/Program name
tcp        0      0 0.0.0.0:22                  0.0.0.0:*               LISTEN
697/sshd
tcp        0      36 144.38.214.133:22          144.38.192.40:52519     ESTABLISHED
1706/sshd: cgl [pri
tcp6       0      0 ::::80                      ::::*
2552/apache2
tcp6       0      0 ::::22                      ::::*
697/sshd
cgl@www:/$  

Now, to create our own website
This site will be accessed via the hostname tarzan.dsutux.us
And, its content will be stored in /var/www/tarzan.dsutux.us
cgl@www:/$ sudo emacs /etc/apache2/sites-available/tarzan.dsutux.us.conf
<VirtualHost *:80>
  ServerName tarzan.dsutux.us
  DocumentRoot /var/www/tarzan.dsutux.us
</VirtualHost>
Need to create the document root directory, and add some content.
cgl@www:/$ sudo mkdir /var/www/tarzan.dsutux.us

cgl@www:/$ sudo bash

root@www:/# cat > /var/www/tarzan.dsutux.us/index.html

I like fruit.

root@www:/# exit

cgl@www:/$
cgl@ns1:/$ echo "On the DNS authoritative master now, to add the tarzan name."
On the DNS authoritative master now, to add the tarzan name.
cgl@ns1:/$
cgl@ns1:/$ sudo emacs /etc/bind/db.dsutux.us
; A (Address) records

ns1 IN A 144.38.214.130
ns2 IN A 144.38.214.131
mail IN A 144.38.214.132
www IN A 144.38.214.133

; A CNAME (Canonical Name) record is an alias to an entry that
; has an A record. This is often done for auxiliary names to
; existing systems.
tarzan IN CNAME www
for updated information.

- **Retry** - How often the secondary (slave) name servers should retry the refresh, if the refresh is unsuccessful.

- **Expire** - How long secondary (slave) name servers should keep and serve this zone information before it is discarded.

- **Minimum/TTL** - How long negative hits should be stored. This is for caching lookup servers that ask our authoritative server for non-existent RR. This tells how long to cache the negative response.

```plaintext
@ IN SOA ns1.dsutux.us. root.ns1.dsutux.us. ( 2014091702 ; Serial  3600 ; Refresh  300 ; Retry  241920 ; Expire  60 ) ; Negative cache TTL

; NS (Name Server) records
;
@ IN NS ns1.dsutux.us.
@ IN NS ns2.dsutux.us.
```

---

Read-Only mode enabled
cgl@ns1:/$ sudo service bind9 restart
* Stopping domain name service... bind9
waiting for pid 3782 to die

* Starting domain name service... bind9

[ OK ]
[ OK ]
cgl@ns1:/$ echo "Check that zone loaded:"
Check that zone loaded:
cgl@ns1:/$ grep 'zone dsutux.us' /var/log/syslog | tail
Sep 17 06:46:52 ns1 named[4060]: zone dsutux.us/IN: loaded serial 2014091702
Sep 17 06:46:52 ns1 named[4060]: zone dsutux.us/IN: sending notifies (serial 2014091702)
cgl@ns1:/$
cgl@ns1:/$ echo "Check that translation is functional:"
Check that translation is functional:
cgl@ns1:/$ dig @144.38.214.130 tarzan.dsutux.us | grep tarzan
; >>> DiG 9.9.5-3-Ubuntu <<< @144.38.214.130 tarzan.dsutux.us
; tarzan.dsutux.us. IN A
tarzan.dsutux.us. 3600 IN CNAME www.dsutux.us.
cgl@ns1:/$ dig @144.38.214.131 tarzan.dsutux.us | grep tarzan
; >>> DiG 9.9.5-3-Ubuntu <<< @144.38.214.131 tarzan.dsutux.us
; tarzan.dsutux.us. IN A
tarzan.dsutux.us. 3600 IN CNAME www.dsutux.us.
cgl@ns1:/$ dig @144.38.1.3 tarzan.dsutux.us | grep tarzan
; >>> DiG 9.9.5-3-Ubuntu <<< @144.38.1.3 tarzan.dsutux.us
; tarzan.dsutux.us. IN A
tarzan.dsutux.us. 3600 IN CNAME www.dsutux.us.
cgl@ns1:/$
cgl@www:/$ echo "Back on the web server."
Back on the web server.
cgl@www:/$
cgl@www:/$ echo "All set up to enable the site now."
All set up to enable the site now.
cgl@www:/$
cgl@www:/$ sudo a2ensite tarzan.dsutux.us
Enabling site tarzan.dsutux.us.
To activate the new configuration, you need to run:
  service apache2 reload

cgl@www:/$
This added an entry in /etc/apache2/sites-enabled

```
cgl@www:/$ ls -l /etc/apache2/sites-enabled/
total 0
lrwxrwxrwx 1 root root 35 Sep 17 06:24 000-default.conf -> ../sites-available/000-default.conf
lrwxrwxrwx 1 root root 40 Sep 17 06:49 tarzan.dsutux.us.conf -> ../sites-available/tarzan.dsutux.us.conf
```
cgl@www:/$ echo "Now, reload apache's configuration files."
Now, reload apache's configuration files.
cgl@www:/$ sudo service apache2 reload
  * Reloading web server apache2
  *
cgl@www:/$
Now, the error.log file should register the reload

```
cgl@www:/$ echo "Now, the error.log file should register the reload"
Now, the error.log file should register the reload
cgl@www:/$ sudo cat /var/log/apache2/error.log
```

```
[Wed Sep 17 06:24:57.362182 2014] [mpm_event:notice] [pid 2552:tid 139743440590720] AH00489: Apache/2.4.7 (Ubuntu) configured -- resuming normal operations
```

```
[Wed Sep 17 06:50:34.611569 2014] [mpm_event:notice] [pid 2552:tid 139743440590720] AH00493: SIGUSR1 received. Doing graceful restart
[Wed Sep 17 06:50:34.620259 2014] [mpm_event:notice] [pid 2552:tid 139743440590720] AH00489: Apache/2.4.7 (Ubuntu) configured -- resuming normal operations
[Wed Sep 17 06:50:34.620282 2014] [core:notice] [pid 2552:tid 139743440590720] AH00094: Command line: '/usr/sbin/apache2'
cgl@www:/$
```
Finally, do an end level functionality test.
This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should replace this file (located at /var/www/html/index.html) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is fully documented in /usr/share/doc/apache2/README.Debian.gz. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the manual if the apache2-doc package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
| `-- ports.conf
```
I like fruit.
cgl@www:/$ echo "The default site still works, as does the tarzan site."
The default site still works, as does the tarzan site.
cgl@www:/$
cgl@www/$ echo "This process can be repeated as many times as needed to add more virtual host sites to apache."
This process can be repeated as many times as needed to add more virtual host sites to apache.
cgl@www/$