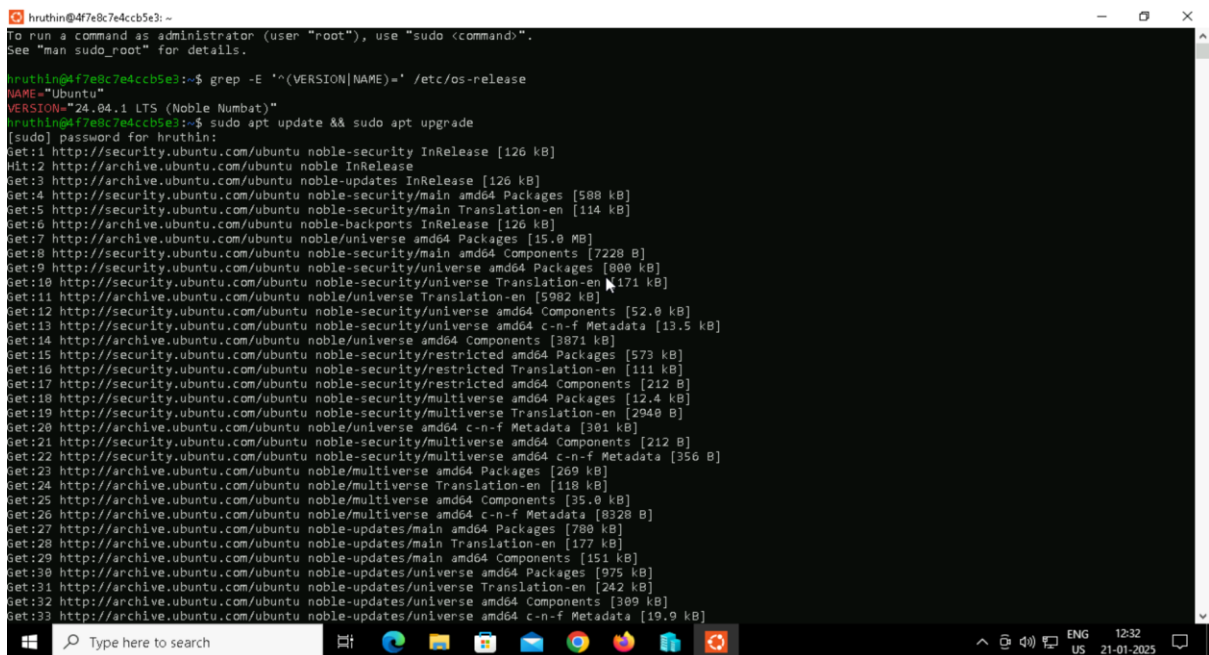# Linux and shell scripting exercises
1. Apache web server

1. Check linux distribution
2. Update and upgrade the system
3. Install apache server
4. Enable apache services
5. Test the Server by Hosting a Simple Website

Screenshots :

```
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
#
# Patches available for rsync vulnerabilities, including a potential RCE,
# tracked by CVE-2024-12084 through CVE-2024-12088 and CVE-2024-12747.
# For more see: https://ubuntu.com/blog/rsync-remote-code-execution
#
The following NEW packages will be installed:
  ethtool
The following upgrades have been deferred due to phasing:
  libpolkit-agent-1-0 libpolkit-gobject-1-0 polkitd
The following packages will be upgraded:
  git git-man libnetplan1 libpython3.12-minimal libpython3.12-stdlib libpython3.12t64 netplan-generator netplan.io python3-netplan python3.12
  python3.12-minimal rsync
12 upgraded, 1 newly installed, 0 to remove and 3 not upgraded.
8 standard LTS security updates
Need to get 14.0 MB of archives.
After this operation, 815 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libpython3.12t64 amd64 3.12.3-1ubuntu0.4 [2346 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 python3.12 amd64 3.12.3-1ubuntu0.4 [651 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libpython3.12-stdlib amd64 3.12.3-1ubuntu0.4 [2068 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 python3.12-minimal amd64 3.12.3-1ubuntu0.4 [2336 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libpython3.12-minimal amd64 3.12.3-1ubuntu0.4 [834 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 rsync amd64 3.2.7-1ubuntu1.2 [436 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 netplan-generator amd64 1.1.1-1~ubuntu24.04.1 [60.8 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 python3-netplan amd64 1.1.1-1~ubuntu24.04.1 [24.3 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble/main amd64 ethtool amd64 1:6.7-1build1 [229 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 netplan.io amd64 1.1.1-1~ubuntu24.04.1 [68.5 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libnetplan1 amd64 1.1.1-1~ubuntu24.04.1 [131 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 git-man all 1:2.43.0-1ubuntu7.2 [1100 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 git amd64 1:2.43.0-1ubuntu7.2 [3679 kB]
Fetched 14.0 MB in 10s (1384 kB/s)
(Reading database ... 40794 files and directories currently installed.)
Preparing to unpack .../00-libpython3.12t64_3.12.3-1ubuntu0.4_amd64.deb ...
Unpacking libpython3.12t64:amd64 (3.12.3-1ubuntu0.4) over (3.12.3-1ubuntu0.3) ...
Preparing to unpack .../01-python3.12_3.12.3-1ubuntu0.4_amd64.deb ...
Unpacking python3.12 (3.12.3-1ubuntu0.4) over (3.12.3-1ubuntu0.3) ...
Preparing to unpack .../02-libpython3.12-stdlib_3.12.3-1ubuntu0.4_amd64.deb ...
```

```
Preparing to unpack .../03-python3.12-minimal_3.12.3-1ubuntu0.4_amd64.deb ...
Unpacking python3.12-minimal (3.12.3-1ubuntu0.4) over (3.12.3-1ubuntu0.3) ...
Preparing to unpack .../04-libpython3.12-minimal_3.12.3-1ubuntu0.4_amd64.deb ...
Unpacking libpython3.12-minimal:amd64 (3.12.3-1ubuntu0.4) over (3.12.3-1ubuntu0.3) ...
Preparing to unpack .../05-rsync_3.2.7-1ubuntu1.2_amd64.deb ...
Unpacking rsync (3.2.7-1ubuntu1.2) over (3.2.7-1ubuntu1) ...
Preparing to unpack .../06-netplan-generator_1.1.1-1~ubuntu24.04.1_amd64.deb ...
Adding 'diversion of /lib/systemd/system-generators/netplan to /lib/systemd/system-generators/netplan.usr-is-merged by netplan-generator'
Unpacking netplan-generator (1.1.1-1~ubuntu24.04.1) over (1.0.1-1ubuntu2~24.04.1) ...
Preparing to unpack .../07-python3-netplan_1.1.1-1~ubuntu24.04.1_amd64.deb ...
Unpacking python3-netplan (1.1.1-1~ubuntu24.04.1) over (1.0.1-1ubuntu2~24.04.1) ...
Selecting previously unselected package ethtool.
Preparing to unpack .../08-ethtool_1%3a6.7-1build1_amd64.deb ...
Unpacking ethtool (1:6.7-1build1) ...
Preparing to unpack .../09-netplan.io_1.1.1-1~ubuntu24.04.1_amd64.deb ...
Unpacking netplan.io (1.1.1-1~ubuntu24.04.1) over (1.0.1-1ubuntu2~24.04.1) ...
Preparing to unpack .../10-libnetplan1_1.1.1-1~ubuntu24.04.1_amd64.deb ...
Unpacking libnetplan1:amd64 (1.1.1-1~ubuntu24.04.1) over (1.0.1-1ubuntu2~24.04.1) ...
Preparing to unpack .../11-git-man_1%3a2.43.0-1ubuntu7.2_all.deb ...
Unpacking git-man (1:2.43.0-1ubuntu7.2) over (1:2.43.0-1ubuntu7.1) ...
Preparing to unpack .../12-git_1%3a2.43.0-1ubuntu7.2_amd64.deb ...
Unpacking git (1:2.43.0-1ubuntu7.2) over (1:2.43.0-1ubuntu7.1) ...
Setting up libpython3.12-minimal:amd64 (3.12.3-1ubuntu0.4) ...
Setting up libnetplan1:amd64 (1.1.1-1~ubuntu24.04.1) ...
Setting up python3-netplan (1.1.1-1~ubuntu24.04.1) ...
Setting up git-man (1:2.43.0-1ubuntu7.2) ...
Setting up netplan-generator (1.1.1-1~ubuntu24.04.1) ...
Removing 'diversion of /lib/systemd/system-generators/netplan to /lib/systemd/system-generators/netplan.usr-is-merged by netplan-generator'
Setting up rsync (3.2.7-1ubuntu1.2) ...
rsync.service is a disabled or a static unit not running, not starting it.
Setting up ethtool (1:6.7-1build1) ...
Setting up python3.12-minimal (3.12.3-1ubuntu0.4) ...
Setting up libpython3.12-stdlib:amd64 (3.12.3-1ubuntu0.4) ...
Setting up python3.12 (3.12.3-1ubuntu0.4) ...
Setting up netplan.io (1.1.1-1~ubuntu24.04.1) ...
Setting up libpython3.12t64:amd64 (3.12.3-1ubuntu0.4) ...
Setting up git (1:2.43.0-1ubuntu7.2) ...
Processing triggers for systemd (255.4-1ubuntu8.4) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for dbus (1.14.10-4ubuntu4.1) ...
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
```

```
Setting up git (1:2.43.0-1ubuntu7.2) ...
Processing triggers for systemd (255.4-1ubuntu8.4) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for dbus (1.14.10-4ubuntu4.1) ...
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
hruthin@4f7e8c7e4ccb5e3:~$ sudo apt install apache2 -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser ufw
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert
0 upgraded, 10 newly installed, 0 to remove and 3 not upgraded.
Need to get 2084 kB of archives.
After this operation, 8094 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libapr1t64 amd64 1.7.2-3.1ubuntu0.1 [108 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble/main amd64 libaprutil1t64 amd64 1.6.3-1.1ubuntu7 [91.9 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.3-1.1ubuntu7 [11.2 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble/main amd64 libaprutil1-ldap amd64 1.6.3-1.1ubuntu7 [9116 B]
Get:5 http://archive.ubuntu.com/ubuntu noble/main amd64 liblua5.4-0 amd64 5.4.6-3build2 [166 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 apache2-bin amd64 2.4.58-1ubuntu8.5 [1329 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 apache2-data all 2.4.58-1ubuntu8.5 [163 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 apache2-utils amd64 2.4.58-1ubuntu8.5 [97.1 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 apache2 amd64 2.4.58-1ubuntu8.5 [90.2 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble/main amd64 ssl-cert all 1.1.2ubuntu1 [17.8 kB]
Fetched 2084 kB in 4s (550 kB/s)
Preconfiguring packages ...
Selecting previously unselected package libapr1t64:amd64.
(Reading database ... 40810 files and directories currently installed.)
Preparing to unpack .../0-libapr1t64_1.7.2-3.1ubuntu0.1_amd64.deb ...
Unpacking libapr1t64:amd64 (1.7.2-3.1ubuntu0.1) ...
Selecting previously unselected package libaprutil1t64:amd64.
Preparing to unpack .../1-libaprutil1t64_1.6.3-1.1ubuntu7_amd64.deb ...
Unpacking libaprutil1t64:amd64 (1.6.3-1.1ubuntu7) ...
Selecting previously unselected package libaprutil1-dbd-sqlite3:amd64.
Preparing to unpack .../2-libaprutil1-dbd-sqlite3_1.6.3-1.1ubuntu7_amd64.deb ...
Unpacking libaprutil1-dbd-sqlite3:amd64 (1.6.3-1.1ubuntu7) ...
Selecting previously unselected package libaprutil1-ldap:amd64.
```

```
Unpacking apache2-utils (2.4.58-1ubuntu8.5) ...
Selecting previously unselected package apache2.
Preparing to unpack .../8-apache2_2.4.58-1ubuntu8.5_amd64.deb ...
Unpacking apache2 (2.4.58-1ubuntu8.5) ...
Selecting previously unselected package ssl-cert.
Preparing to unpack .../9-ssl-cert_1.1.2ubuntu1_all.deb ...
Unpacking ssl-cert (1.1.2ubuntu1) ...
Setting up ssl-cert (1.1.2ubuntu1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/ssl-cert.service → /usr/lib/systemd/system/ssl-cert.service.
Setting up libapr1t64:amd64 (1.7.2-3.1ubuntu0.1) ...
Setting up liblua5.4-0:amd64 (5.4.6-3build2) ...
Setting up apache2-data (2.4.58-1ubuntu8.5) ...
Setting up libaprutil1t64:amd64 (1.6.3-1.1ubuntu7) ...
Setting up libaprutil1-ldap:amd64 (1.6.3-1.1ubuntu7) ...
Setting up libaprutil1-dbd-sqlite3:amd64 (1.6.3-1.1ubuntu7) ...
Setting up apache2-utils (2.4.58-1ubuntu8.5) ...
Setting up apache2-bin (2.4.58-1ubuntu8.5) ...
Setting up apache2 (2.4.58-1ubuntu8.5) ...
Enabling module mpm_event.
Enabling module authz_core.
Enabling module authz_host.
Enabling module authn_core.
Enabling module auth_basic.
Enabling module access_compat.
Enabling module authn_file.
Enabling module authz_user.
Enabling module alias.
Enabling module dir.
Enabling module autoindex.
Enabling module env.
Enabling module mime.
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
```
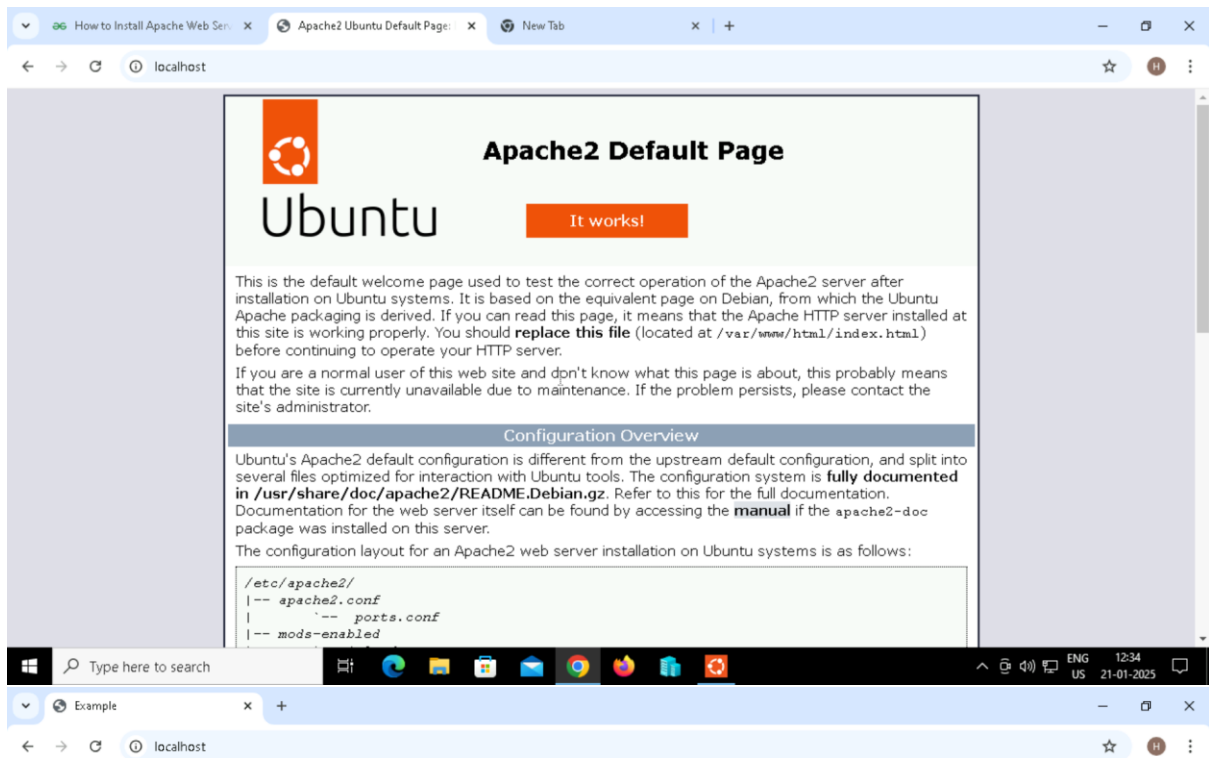
```
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /usr/lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /usr/lib/systemd/system/apache-htcacheclean.service.
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
hruthin@4f7e8c7e4ccb5e3:~$ sudo systemctl enable apache2
Synchronizing state of apache2.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable apache2
hruthin@4f7e8c7e4ccb5e3:~$ sudo mkdir /var/www/html/test_website/
hruthin@4f7e8c7e4ccb5e3:~$ echo '<html><head><title>Example</title></head><body><h1>GFG</h1><p>This is a test.</p></body></html>' | sudo tee /var/www/html/te
st_website/index.html
<html><head><title>Example</title></head><body><h1>GFG</h1><p>This is a test.</p></body></html>
hruthin@4f7e8c7e4ccb5e3:~$ sudo echo '<VirtualHost *:80>
>       ServerName web.testingserver.com
>       DocumentRoot /var/www/html/website
>       DirectoryIndex index.html
>       ErrorLog /var/log/httpd/example.com_error.log
>       CustomLog /var/log/httpd/example.com_requests.log combined
> </VirtualHost>' > /etc/httpd/conf.d/web.conf
-bash: /etc/httpd/conf.d/web.conf: No such file or directory
hruthin@4f7e8c7e4ccb5e3:~$ sudo echo '<VirtualHost *:80>
      ServerName web.testingserver.com
      DocumentRoot /var/www/html/website
      DirectoryIndex index.html
      ErrorLog /var/log/httpd/example.com_error.log
      CustomLog /var/log/httpd/example.com_requests.log combined
</VirtualHost>' > /etc/httpd/conf.d/web.conf
-bash: /etc/httpd/conf.d/web.conf: No such file or directory
hruthin@4f7e8c7e4ccb5e3:~$ sudo chown -R apache:apache /var/www/html/test_website
hmod -R 755 /var/www/html/test_websitesudo chmod -R 755 /var/www/html/test_websitechown: invalid user: 'apache:apache'
hruthin@4f7e8c7e4ccb5e3:~$ sudo mkdir /var/www/html/test_website/
mkdir: cannot create directory '/var/www/html/test_website/': File exists
hruthin@4f7e8c7e4ccb5e3:~$ vi index.html

/bin/bash: line 1: wq: command not found
```

```
-bash: /etc/httpd/conf.d/web.conf: No such file or directory
hruthin@4f7e8c7e4ccb5e3:~$ sudo chown -R apache:apache /var/www/html/test_website
hmod -R 755 /var/www/html/test_websitesudo chmod -R 755 /var/www/html/test_websitechown: invalid user: 'apache:apache'
hruthin@4f7e8c7e4ccb5e3:~$ sudo mkdir /var/www/html/test_website/
mkdir: cannot create directory '/var/www/html/test_website/': File exists
hruthin@4f7e8c7e4ccb5e3:~$ vi index.html

/bin/bash: line 1: wq: command not found

shell returned 127

Press ENTER or type command to continue
hruthin@4f7e8c7e4ccb5e3:~$ sudo mkdir /var/www/html/test_website/
mkdir: cannot create directory '/var/www/html/test_website/': File exists
hruthin@4f7e8c7e4ccb5e3:~$ sudo tee /var/www/html/test_website/index.html
^C
hruthin@4f7e8c7e4ccb5e3:~$ vi index.html
hruthin@4f7e8c7e4ccb5e3:~$ sudo tee /var/www/html/test_website/index.html
^C
hruthin@4f7e8c7e4ccb5e3:~$ sudo echo '<VirtualHost *:80>
>       ServerName web.testingserver.com
>       DocumentRoot /var/www/html/website
>       DirectoryIndex index.html
>       ErrorLog /var/log/httpd/example.com_error.log
>       CustomLog /var/log/httpd/example.com_requests.log combined
> </VirtualHost>' > /etc/httpd/conf.d/web.conf
-bash: /etc/httpd/conf.d/web.conf: No such file or directory
hruthin@4f7e8c7e4ccb5e3:~$ sudo mkdir -p /etc/httpd/conf.d/
hruthin@4f7e8c7e4ccb5e3:~$ sudo chown -R apache:apache /var/www/html/test_website
hmod -R 755 /var/www/html/test_website
sudo chmod -R 755 /var/www/html/test_website
chown: invalid user: 'apache:apache'
hruthin@4f7e8c7e4ccb5e3:~$ sudo chown -R apache:apache /var/www/html/test_website
chown: invalid user: 'apache:apache'
hruthin@4f7e8c7e4ccb5e3:~$
```

Apache2 Default Page

It works!

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
|-- mods-enabled
```

GFG

This is a test.