Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous College Affiliated to University of Mumbai)

Computer Engineering Department
Engineering Department

Academic Year: 2021-2022

Class: S.Y.B.Tech **Sem.:** 4 **Course:** CCN

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Experiment No.	5		

AIM:	To setup a Apache Web server on a linux machine
THEORY:	**Whats is Apache Web Application Architecture?** Apache is the web server that processes requests and serves web assets and content via HTTP. MySQL is the database that stores all your information in an easily queried format. PHP is the programming language that works with apache to help create dynamic web content. Firewalls help protect the web application from both external threats and internal vulnerabilities depending on where the firewalls are configured. Load Balancers help distribute traffic across the web servers which handle the HTTP(S) requests (this is where Apache comes in) and application servers (servers that handle the functionality and workload of the web app.) **Web Server Landscape** The internet is comprised of many different technologies and not all of them are the same. While Apache is arguably one of the most popular web servers out there on the net, there are many other players and the landscape is always changing. Back in the late 90s and early 2000s, Apache's dominance was very strong, serving over 50% of the internet's active websites. Microsoft's IIS (Internet Information Services) was also an option but not nearly as popular. **Why Apache Web Servers?**

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	Apache is considered open source software, which means the original source code is freely available for viewing and collaboration. Being open source has made Apache very popular with developers who have built and configured their own modules to apply specific functionality and improve on its core features. Apache has been around since 1995 and is responsible as a core technology that helped spur the initial growth of the internet in its infancy. **Features of Apache Web Server** • Handling of static files • Loadable dynamic modules • Auto-indexing • .htaccess • Compatible with IPv6 • Supports HTTP/2 • FTP connections • Gzip compression and decompression • Bandwidth throttling • Perl, PHP, Lua scripts • Load balancing • Session tracking • URL rewriting • Geolocation based on IP address APACHE CONFIGURATION FILES IN /ETC/APACHE2/ # charset.conv Specifies which character sets to use for different languages. Do not edit this file. conf.d/*.conf Configuration files added by other modules. These configuration files can be included into your virtual host configuration where

	needed. See vhosts.d/vhost.template for examples. By doing so, you can provide different module sets for different virtual hosts. default-server.conf Global configuration for all virtual hosts with reasonable defaults. Instead of changing the values, overwrite them with a virtual host configuration. errors.conf Defines how Apache responds to errors. To customize these messages for all virtual hosts, edit this file. Otherwise overwrite these directives in your virtual host configurations. listen.conf Binds Apache to specific IP addresses and ports. Name-based virtual hosting is also configured here. For details, see Section 31.2.2.1.1, "Name-Based Virtual Hosts". magic Data for the mime_magic module that helps Apache automatically determine the MIME type of an unknown file. Do not change this file. mime.types MIME types known by the system (this actually is a link to /etc/mime.types). Do not edit this file. If you need to add MIME types not listed here, add them to mod_mime-defaults.conf. mod_*.conf Configuration files for the modules that are installed by default. Refer to Section 31.4, "Installing, Activating, and Configuring Modules" for details. Note that configuration files for optional modules reside in the directory conf.d.

server-tuning.conf
Contains configuration directives for the different MPMs (see Section 31.4.4, "Multiprocessing Modules") as well as general configuration options that control Apache's performance. Properly test your Web server when making changes here.

ssl-global.conf and ssl.*
Global SSL configuration and SSL certificate data. Refer to Section 31.6, "Setting Up a Secure Web Server with SSL" for details.

sysconfig.d/*.conf
Configuration files automatically generated from /etc/sysconfig/apache2. Do not change any of these files—edit /etc/sysconfig/apache2 instead. Do not put other configuration files in this directory.

uid.conf
Specifies under which user and group ID Apache runs. Do not change this file.

```
/etc/apache2/
      |
      |- charset.conv
      |- conf.d/
      |    |
      |    |- *.conf
      |
      |- default-server.conf
      |- errors.conf
      |- httpd.conf
      |- listen.conf
      |- magic
      |- mime.types
      |- mod_*.conf
      |- server-tuning.conf
      |- ssl.*
      |- ssl-global.conf
      |- sysconfig.d
      |    |
      |    |- global.conf
      |    |- include.conf
      |    |- loadmodule.conf . .
      |
      |- uid.conf
      |- vhosts.d
      |    |- *.conf
```

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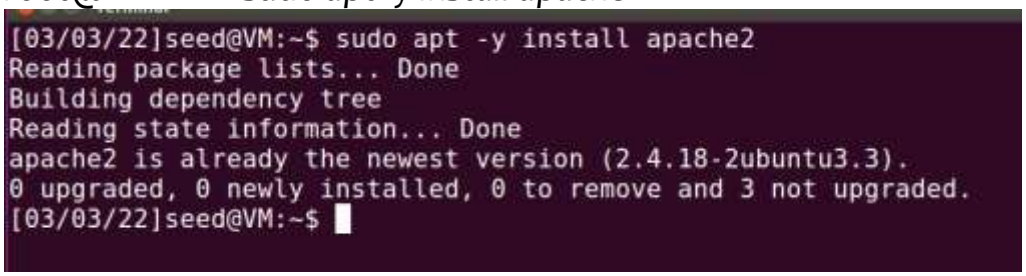
EXPERIMENT	
PROCEDURE:	**SETTING UP THE WEB SERVER:** The Apache2 web server is available in Ubuntu Linux. To install Apache2: 1) At a terminal prompt enter the following command: *root@www:~# sudo apt -y install apache2*  2) Configure Apache2: *root@www:~# sudo gedit /etc/apache2/conf-enabled/security.conf #* line 25: change the ServerTokens from OS to Prod *ServerTokens Prod* 

```
[03/03/22]seed@VM:~$ sudo apt -y install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
apache2 is already the newest version (2.4.18-2ubuntu3.3).
0 upgraded, 0 newly installed, 0 to remove and 3 not upgraded.
[03/03/22]seed@VM:~$
```

```
Open ▾  /#

#
# Disable access to the entire file system except for the directories that
# are explicitly allowed later.
#
# This currently breaks the configurations that come with some web application
# Debian packages.
#
#<Directory />
#   AllowOverride None
#   Require all denied
#</Directory>


# Changing the following options will not really affect the security of the
# server, but might make attacks slightly more difficult in some cases.

#
# ServerTokens
# This directive configures what you return as the Server HTTP response
# Header. The default is 'Full' which sends information about the OS-Type
# and compiled in modules.
# Set to one of:  Full | OS | Minimal | Minor | Major | Prod
# where Full conveys the most information, and Prod the least.
#ServerTokens Minimal
ServerTokens Prod
#ServerTokens Full

#
# Optionally add a line containing the server version and virtual host
# name to server-generated pages (internal error documents, FTP directory
# listings, mod_status and mod_info output etc., but not CGI generated
# documents or custom error documents).
# Set to "EMail" to also include a mailto: link to the ServerAdmin.
# Set to one of:  On | Off | EMail
#ServerSignature Off
ServerSignature On

#
# Allow TRACE method
#
# Set to "extended" to also reflect the request body (only for testing and
# diagnostic purposes).
#
# Set to one of:  On | Off | extended
TraceEnable Off
#TraceEnable On

#
```

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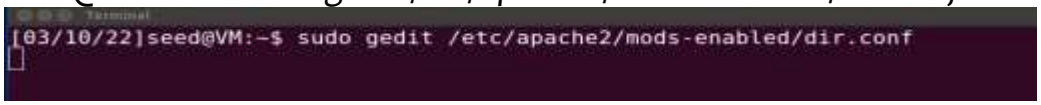
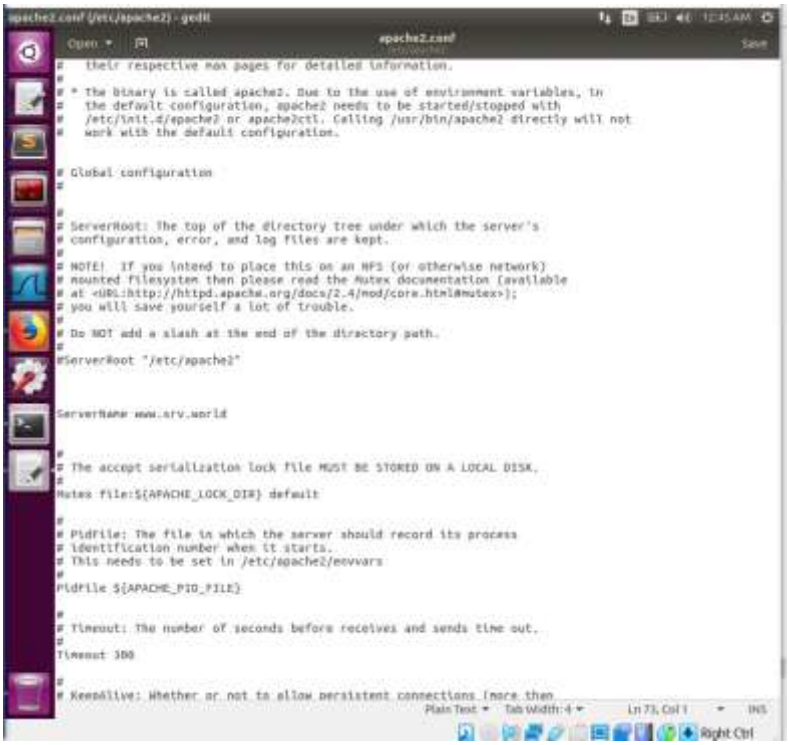
3) Enter the following command on the terminal:
root@www:~# sudo gedit /etc/apache2/mods-enabled/dir.conf



line 2: add file name that it can access only with directory's name
DirectoryIndex index.html index.htm

4) Enter the following command on the terminal:
root@www:~# sudo gedit /etc/apache2/apache2.conf
line 70: add to specify server name
ServerName www.srv.world



5)Enter the following command on the terminal:

root@www:~# sudo gedit /etc/apache2/sites-enabled/000-default.conf

```
[03/10/22]seed@VM:~$ sudo gedit /etc/apache2/mods-enabled/dir.conf

** (gedit:10176): WARNING **: Set document metadata failed: Setting attribute me
tadata::gedit-position not supported
[03/10/22]seed@VM:~$ sudo gedit /etc/apache2/sites-enabled/000-default.conf

** (gedit:10208): WARNING **: Set document metadata failed: Setting attribute me
tadata::gedit-position not supported
```

line 11: change to webmaster's email
ServerAdmin webmaster@srv.world

```
<VirtualHost *:80>
        # The ServerName directive sets the request scheme, hostname and port that
        # the server uses to identify itself. This is used when creating
        # redirection URLs. In the context of virtual hosts, the ServerName
        # specifies what hostname must appear in the request's Host: header to
        # match this virtual host. For the default virtual host (this file) this
        # value is not decisive as it is used as a last resort host regardless.
        # However, you must set it for any further virtual host explicitly.
        #ServerName www.example.com

        ServerAdmin webmaster@srvworld
        DocumentRoot /var/www/html

        # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for particular
        # modules, e.g.
        #LogLevel info ssl:warn

        ErrorLog ${APACHE_LOG_DIR}/error.log
        CustomLog ${APACHE_LOG_DIR}/access.log combined

        # For most configuration files from conf-available/, which are
        # enabled or disabled at a global level, it is possible to
        # include a line for only one particular virtual host. For example the
        # following line enables the CGI configuration for this host only
        # after it has been globally disabled with "a2disconf".
        #Include conf-available/serve-cgi-bin.conf
```

6) Enter the following command on the terminal:
root@www:~# sudo systemctl restart apache2

```
[03/10/22]seed@VM:~$ sudo systemctl restart apache2
```

7) Access to [http://(your server's hostname or IP address)/] with web browser.

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```
[03/03/22]seed@VM:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN g
roup default qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fas
t state UP group default qlen 1000
    link/ether 08:00:27:cc:02:d4 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic enp0s3
       valid_lft 82068sec preferred_lft 82068sec
    inet6 fe80::6998:444e:e4:3b/64 scope link
       valid_lft forever preferred_lft forever
```

8) Entering the ip address of the webpage(one can even enter the url):

9) The webpage gets loaded:

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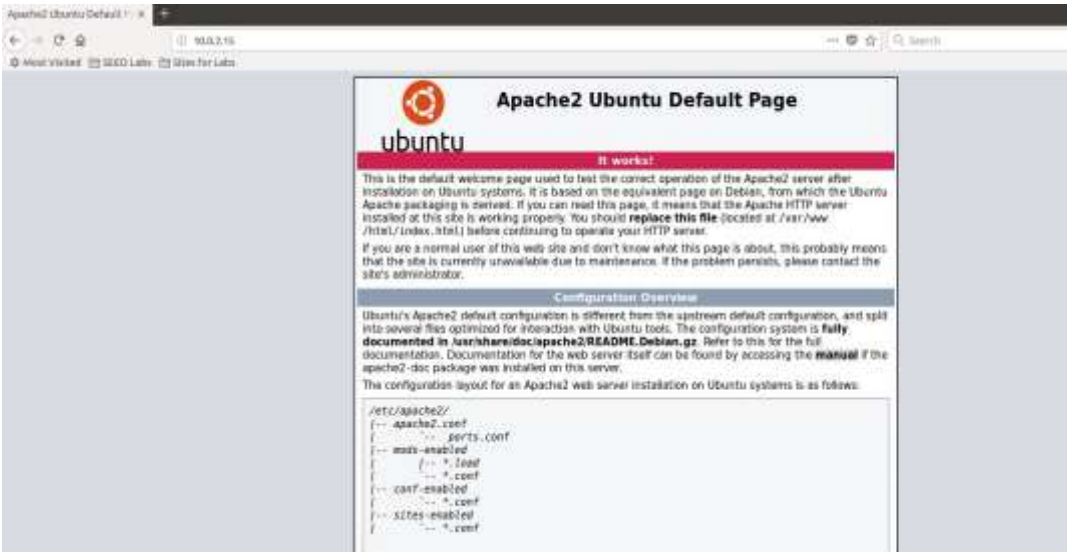

RESULT: This experiment taught me how to set up Apache web server and how to load a website using Inet address. Learnt how the Apache's web services and its features.