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# Project D

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# Installation and configuration of Apache2 web server on Ubuntu 20.04

## Installation and configuration of Apache2 web server on Ubuntu 20.04

### STEPS:

1. Command for Installation of Apache2 web server on Ubuntu.

```
project@ubuntu:~$ sudo apt update
[sudo] password for project:
Get:1 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Hit:2 http://us.archive.ubuntu.com/ubuntu bionic InRelease
Get:3 http://us.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:4 http://us.archive.ubuntu.com/ubuntu bionic-backports InRelease [83.3 kB]
Hit:5 http://us.archive.ubuntu.com/ubuntu bionic-backports/main i386 Packages
Ign:5 http://us.archive.ubuntu.com/ubuntu bionic-backports/main i386 Packages
Hit:6 http://us.archive.ubuntu.com/ubuntu bionic-backports/main amd64 Packages
Ign:6 http://us.archive.ubuntu.com/ubuntu bionic-backports/main amd64 Packages
Hit:7 http://us.archive.ubuntu.com/ubuntu bionic-backports/main Translation-en
Ign:7 http://us.archive.ubuntu.com/ubuntu bionic-backports/main Translation-en
Hit:8 http://us.archive.ubuntu.com/ubuntu bionic-backports/main amd64 DEP-11 Metadata
Ign:8 http://us.archive.ubuntu.com/ubuntu bionic-backports/main amd64 DEP-11 Metadata
Hit:9 http://us.archive.ubuntu.com/ubuntu bionic-backports/main DEP-11 48x48 Icons
Hit:10 http://us.archive.ubuntu.com/ubuntu bionic-backports/main DEP-11 64x64 Icons
Hit:11 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 Packages
Ign:11 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 Packages
Hit:12 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe i386 Packages
Ign:12 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe i386 Packages
Hit:13 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe Translation-en
Ign:13 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe Translation-en
Hit:14 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 DEP-11 Metadata
Ign:14 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 DEP-11 Metadata
Hit:15 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe DEP-11 48x48 Icons
Hit:16 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe DEP-11 64x64 Icons
Ign:5 http://us.archive.ubuntu.com/ubuntu bionic-backports/main i386 Packages
Ign:6 http://us.archive.ubuntu.com/ubuntu bionic-backports/main amd64 Packages
```

```
project@ubuntu:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap
  liblua5.2-0
0 upgraded, 9 newly installed, 0 to remove and 425 not upgraded.
Need to get 1,713 kB of archives.
After this operation, 6,932 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 libapr1 amd64 1.6.3-2 [90.9 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 libaprutil1 amd64 1.6.1-2 [84.4 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.1-2 [10.6 kB]
Get:4 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 libaprutil1-ldap amd64 1.6.1-2 [8,764 B]
Get:5 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 liblua5.2-0 amd64 5.2.4-1.1build1 [108 kB]
Get:6 http://us.archive.ubuntu.com/ubuntu bionic-updates/main amd64 apache2-bin amd64 2.4.29-1ubuntu4.25 [1,072 kB]
Get:7 http://us.archive.ubuntu.com/ubuntu bionic-updates/main amd64 apache2-utils amd64 2.4.29-1ubuntu4.25 [83.8 kB]
Get:8 http://us.archive.ubuntu.com/ubuntu bionic-updates/main amd64 apache2-data all 2.4.29-1ubuntu4.25 [160 kB]
Get:9 http://us.archive.ubuntu.com/ubuntu bionic-updates/main amd64 apache2 amd64 2.4.29-1ubuntu4.25 [95.1 kB]
Fetched 1,713 kB in 0s (4,457 kB/s)
Selecting previously unselected package libapr1:amd64.
(Reading database ... 133674 files and directories currently installed.)
Preparing to unpack .../0-libapr1_1.6.3-2_amd64.deb ...
```

2. Run the following command to open certain ports on the system in order to access Apache from outside.

```
project@ubuntu:~$ sudo ufw app list
Available applications:
  Apache
  Apache Full
  Apache Secure
  CUPS
project@ubuntu:~$
```

3. We will use the highly restrictive profile ‘Apache’ to enable network activity on port 80.

```
project@ubuntu:~$ sudo ufw 'Apache'
ERROR: Invalid syntax

Usage: ufw COMMAND

Commands:
 enable                     enables the firewall
 disable                    disables the firewall
 default ARG                set default policy
 logging LEVEL              set logging to LEVEL
 allow ARGS                 add allow rule
 deny ARGS                  add deny rule
 reject ARGS                add reject rule
 limit ARGS                 add limit rule
 delete RULE|NUM            delete RULE
 insert NUM RULE            insert RULE at NUM
 route RULE                 add route RULE
 route delete RULE|NUM      delete route RULE
 route insert NUM RULE      insert route RULE at NUM
 reload                     reload firewall
 reset                      reset firewall
 status                     show firewall status
 status numbered            show firewall status as numbered list of RULES
 status verbose             show verbose firewall status
 show ARG                   show firewall report
 version                    display version information

Application profile commands:
 route insert NUM RULE      insert route RULE at NUM
 reload                     reload firewall
 reset                      reset firewall
 status                     show firewall status
 status numbered            show firewall status as numbered list of RULES
 status verbose             show verbose firewall status
 show ARG                   show firewall report
 version                    display version information

Application profile commands:
 app list                   list application profiles
 app info PROFILE           show information on PROFILE
 app update PROFILE         update PROFILE
 app default ARG            set default application policy

project@ubuntu:~$
```

4. Check the status which will show Apache allowed in firewall.

```
project@ubuntu:~$ sudo ufw status
Status: active

To                         Action      From
--                         ------      ----
2049                       ALLOW       192.168.105.0/24

project@ubuntu:~$
```

5. Now to verify that Apache service is running or not. For this, execute the below command in terminal.

```
project@ubuntu:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
  Drop-In: /lib/systemd/system/apache2.service.d
           └─apache2-systemd.conf
   Active: active (running) since Thu 2023-01-26 01:51:32 PST; 8min ago
 Main PID: 3230 (apache2)
    Tasks: 55 (limit: 2295)
   CGroup: /system.slice/apache2.service
           ├─3230 /usr/sbin/apache2 -k start
           ├─3231 /usr/sbin/apache2 -k start
           └─3232 /usr/sbin/apache2 -k start

Jan 26 01:51:32 ubuntu systemd[1]: Starting The Apache HTTP Server...
Jan 26 01:51:32 ubuntu apachectl[3219]: AH00558: apache2: Could not reliably determine the server's fully qualified doma
Jan 26 01:51:32 ubuntu systemd[1]: Started The Apache HTTP Server.
lines 1-15/15 (END)
```

6. We can see the Apache2 service is active and running. In this step, we will create a directory for our domain name. This directory will be used for storing the data on our website. The directory name here we choose is **oslabproj.net.** Then, change the directory ownership to current user.

```
project@ubuntu:~$ sudo mkdir -p /var/www/oslabproj.net/html
project@ubuntu:~$ sudo chown -R $USER:$USER /var/www/oslabproj.net/html
```

7. Assign necessary permissions as follows:

```
project@ubuntu:~$ sudo chmod -R 755 /var/www/oslabproj.net
```

8. Now we, will create a sample page for our website. We will create the sample page using Nano editor, however, any text editor can be used for this purpose.

```
project@ubuntu:~$ nano /var/www/oslabproj.net/html/index.html
project@ubuntu:~$
```

```
  GNU nano 2.9.3                                        /var/www/oslabproj

<html>
<head>
<title> WELCOME TO OSLAB PROJECT </title>
</head>
<body>
<h1> You are running os lab project on ubuntu</h1>
</body>
</html>
```

**9.** Generate the new virtual host file with the following command.

```
project@ubuntu:~$ sudo nano /etc/apache2/sites-available/oslabproj.net.conf
```

```
File  Edit  View  Search  Terminal  Help
 GNU nano 2.9.3                    /etc/apache2/sites-available/oslabproj.net.conf

<VirtualHost *:80>
ServerAdmin admin@oslabproj.net
ServerName oslabproj.net
ServerAlias oslabproj.net
DocumentRoot /var/www/oslabproj.net/html
ErrorLog ${APACHE_LOG_DIR}/error.log
CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```

**10.** Now create the virtual host configuration file.

```
project@ubuntu:~$ sudo a2ensite oslabproj.net.conf
[sudo] password for user:
Enabling site oslabproj.net.
To activate the new configuration, you need to run:
  systemctl reload apache2
```

**11.** Then, to disable the "000-default.conf" default virtual configuration file. Restart Apache to activate the new configuration as follows.

```
project@ubuntu:~$ sudo systemctl restart apache2
```

**12.** Once all the configurations are completed, we can test for any configuration errors.

```
project@ubuntu:~$ sudo apache2ctl configtest
[Sun Jan 08 22:05:56.218095 2023] [core:warn] [pid 5493:tid 140694930340800]
AH00558: apache2: Could not reliably determine the server's fully qualified d
lly to suppress this message
Syntax OK
```

**13.** To resolve this error, run the following command.

```
project@ubuntu:~$ sudo nano /etc/apache2/conf-available/servername.conf
```

**14.** Edit the **servername.conf** file:

```
project@ubuntu:~$ sudo a2enconf servername
Enabling conf servername.
To activate the new configuration, you need to run:
  systemctl reload apache2
```

**15.** Now after resolving the error, check again.

```
project@ubuntu:~$ sudo apache2ctl configtest
[Sun Jan 08 22:09:33.520893 2023] [core:warn] [pid 5514:tid 139826874522560]
Syntax OK
```

**16.** This command starts the server apache2.

```
project@ubuntu:~$ sudo systemctl start apache2
```

**17.** This command stops the server apache2.

```
project@ubuntu:~$ sudo systemctl stop apache2
```

**18.** This command reloads the server apache2.

```
project@ubuntu:~$ sudo systemctl reload apache2
apache2.service is not active, cannot reload.
```

**19.** This command enables the server apache2.

```
project@ubuntu:~$ sudo systemctl enable apache2
Synchronizing state of apache2.service with SysV service script with /lib/syste
d/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable apache2
```

**20.** This command disables the server apache2.

```
project@ubuntu:~$ sudo systemctl disable apache2
Synchronizing state of apache2.service with SysV service script with /lib/system
d/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install disable apache2
```