

# Web Server

## About:

A web server is software or computer program that stores and delivers web content such as websites and web pages when people access them through their web browsers, allowing them to view and interact with information online.

It is necessary to host websites on the Internet.

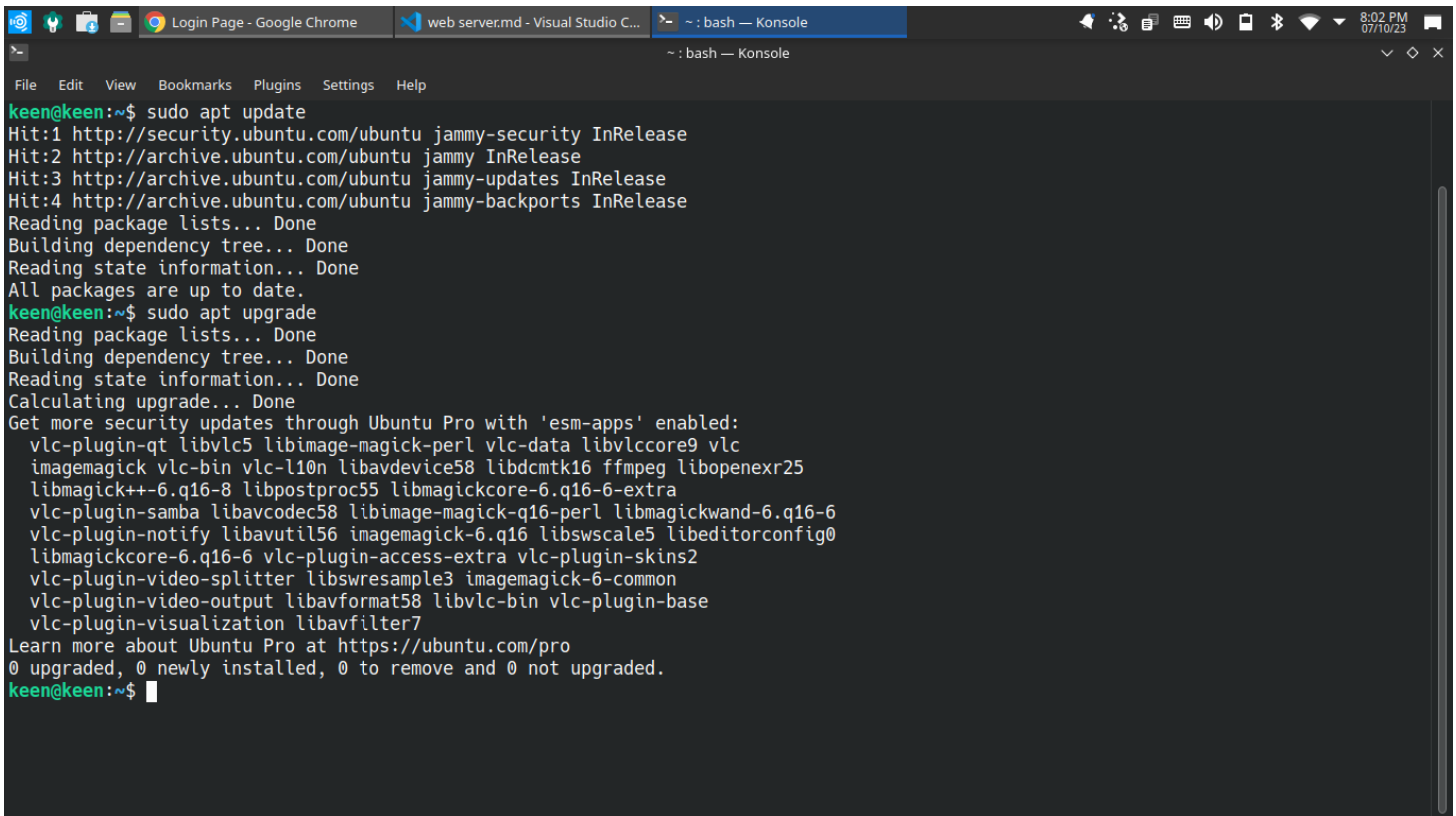
**Here's why a web server is necessary for hosting websites on Ubuntu, or any other operating system:**

- 1. Request Handling:** Web servers are designed to handle HTTP (Hypertext Transfer Protocol) requests from clients, such as web browsers. When a user enters a website's URL or clicks a link, their browser sends an HTTP request to the web server hosting that website. The web server processes this request and sends back the requested web page or resource.
- 2. Content Storage:** A web server stores all the files and data that make up a website, including HTML documents, images, videos, stylesheets, scripts, and more. When a user requests a web page, the server retrieves and delivers these files to the user's browser.
- 4. Security:** Web servers play a crucial role in security by implementing various security measures, such as access controls, encryption (HTTPS), and firewalls, to protect websites from unauthorized access, data breaches, and other security threats.
- 5. Load Balancing:** For high-traffic websites, multiple web servers can be used behind a load balancer to distribute incoming requests evenly. This ensures that the website can handle a large number of users simultaneously without becoming slow or unresponsive.
- 6. Hosting Multiple Websites:** A single web server can host multiple websites, each with its own domain name and content. Server configuration and virtual hosting allow multiple websites to share the same server resources while remaining separate from each other.

## Install the Apache Web Server (Ubuntu):

## 1. Update Package Repository

- `sudo apt update`
- `sudo apt upgrade`



The screenshot shows a terminal window with the following output:

```
keen@keen:~$ sudo apt update
Hit:1 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:2 http://archive.ubuntu.com/ubuntu jammy InRelease
Hit:3 http://archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:4 http://archive.ubuntu.com/ubuntu jammy-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
keen@keen:~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
Get more security updates through Ubuntu Pro with 'esm-apps' enabled:
vlc-plugin-qt libvlc5 libimage-magick-perl vlc-data libvlccore9 vlc
imagemagick vlc-bin vlc-l10n libavdevice58 libdcmtk16 ffmpeg libopenexr25
libmagick++-6.q16-8 libpostproc55 libmagickcore-6.q16-6-extra
vlc-plugin-samba libavcodec58 libimage-magick-q16-perl libmagickwand-6.q16-6
vlc-plugin-notify libavutil56 imagemagick-6.q16 libswscale5 libeditorconfig0
libmagickcore-6.q16-6 vlc-plugin-access-extra vlc-plugin-skins2
vlc-plugin-video-splitter libswresample3 imagemagick-6-common
vlc-plugin-video-output libavformat58 libvlc-bin vlc-plugin-base
vlc-plugin-visualization libavfilter7
Learn more about Ubuntu Pro at https://ubuntu.com/pro
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
keen@keen:~$
```

## 2. Install Web Server

- `sudo apt install apache2`

```
Web Server - Google Docs - Goo... web server.md - Visual Studio C... ~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
keen@keen:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apache2 is already the newest version (2.4.52-1ubuntu4.6).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
keen@keen:~$
```

### 3. Start the Web Server

- `sudo systemctl start apache2`
- `sudo systemctl enable apache2`
- `sudo systemctl status apache2`

```
Web Server - Google Docs - Goo... web server.md - Visual Studio C... ~ : bash — Konsole
File Edit View Bookmarks Plugins Settings Help
keen@keen:~$ sudo systemctl start apache2
keen@keen:~$ sudo systemctl enable apache2
Synchronizing state of apache2.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable apache2
keen@keen:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2023-10-07 17:53:59 IST; 2h 10min ago
     Docs: https://httpd.apache.org/docs/2.4/
    Main PID: 7323 (apache2)
      Tasks: 55 (limit: 9222)
     Memory: 5.5M
        CPU: 1.250s
    CGroup: /system.slice/apache2.service
            └─ 7323 /usr/sbin/apache2 -k start
               11769 /usr/sbin/apache2 -k start
               11797 /usr/sbin/apache2 -k start

Oct 07 19:55:06 keen apachectl[11510]: AH00112: Warning: DocumentRoot [/var/www/example.com/public_html] does not exist
Oct 07 19:55:06 keen systemd[1]: Reloaded The Apache HTTP Server.
Oct 07 19:57:03 keen systemd[1]: Reloading The Apache HTTP Server...
Oct 07 19:57:03 keen apachectl[11645]: AH00112: Warning: DocumentRoot [/var/www/basic.com/html] does not exist
Oct 07 19:57:03 keen apachectl[11645]: AH00112: Warning: DocumentRoot [/var/www/example.com/public_html] does not exist
Oct 07 19:57:03 keen systemd[1]: Reloaded The Apache HTTP Server.
Oct 07 19:58:17 keen systemd[1]: Reloading The Apache HTTP Server...
Oct 07 19:58:17 keen apachectl[11768]: AH00112: Warning: DocumentRoot [/var/www/basic.com/html] does not exist
Oct 07 19:58:17 keen apachectl[11768]: AH00112: Warning: DocumentRoot [/var/www/example.com/public_html] does not exist
Oct 07 19:58:17 keen systemd[1]: Reloaded The Apache HTTP Server.
keen@keen:~$
```

# Purpose of the Apache default web root directory:

The Apache default web root directory on Ubuntu, also known as the DocumentRoot, is the directory where the Apache web server looks for files to serve when a client (such as a web browser) requests a web page.

This directory is where you typically place your website's files, including HTML, CSS, JavaScript, images, and other assets.

## The default location of the Apache web root directory:

- `/var/www/html`

You can change the web root directory in Apache by modifying the Apache configuration files:

### 1. Open Configuration File

- `sudo vim /etc/apache2/apache2.conf`

### 2. Restart Web Server

- `sudo systemctl restart apache2`

# Configuring Virtual Hosts:

Configuring Virtual Hosts in Apache on Ubuntu is significant because it allows you to host multiple websites or web applications on a single server.

## Set up a basic Virtual Host on Apache:

### 1. Create a directory for your website:

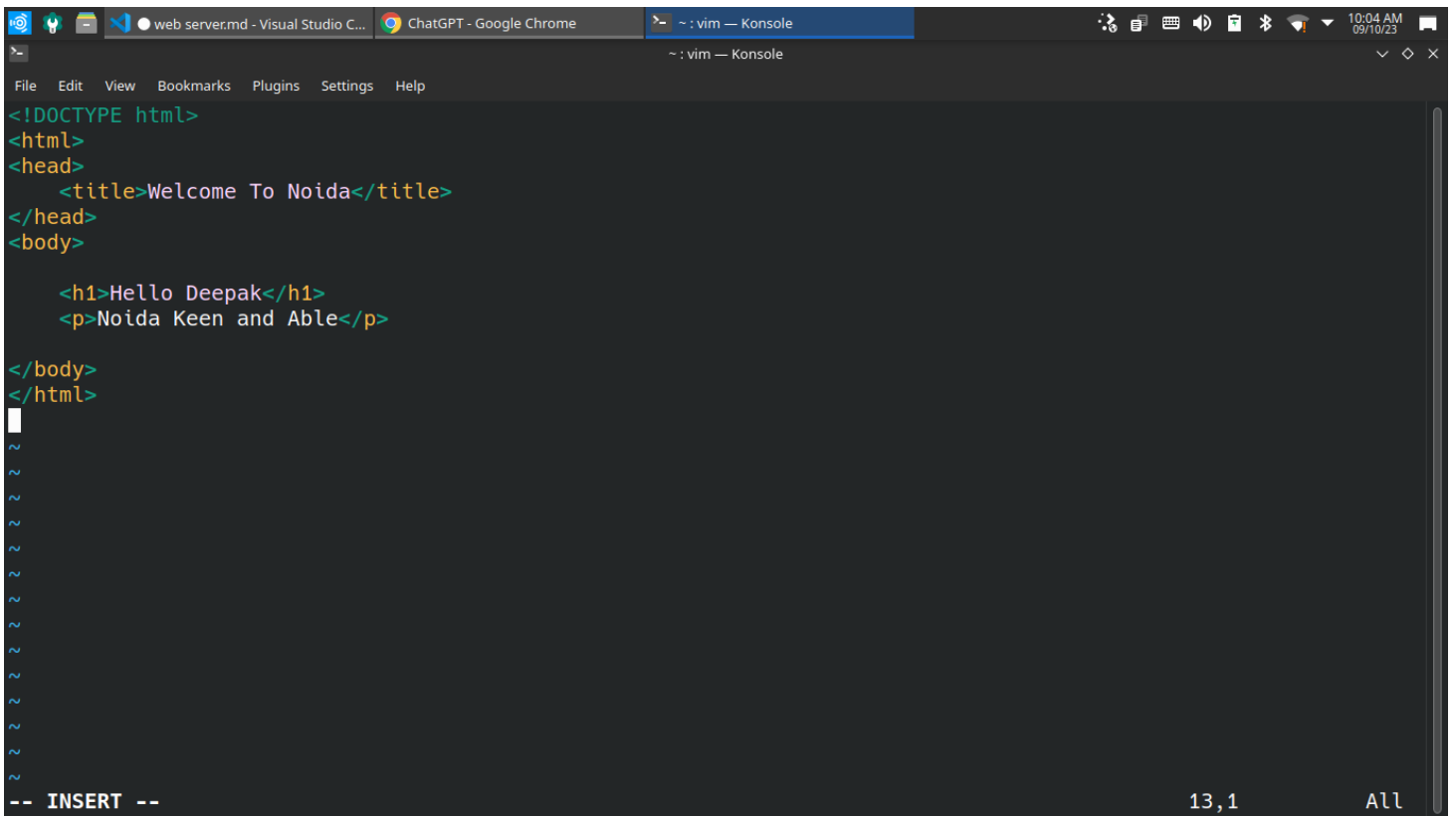
- `sudo mkdir -p /var/www/basic/html`

### 2. Assign ownership:

- `sudo chown -R www-data:www-data /var/www/basic/html/`

### 3. Create an HTML file:

- `sudo vim /var/www/basic/html/index.html`

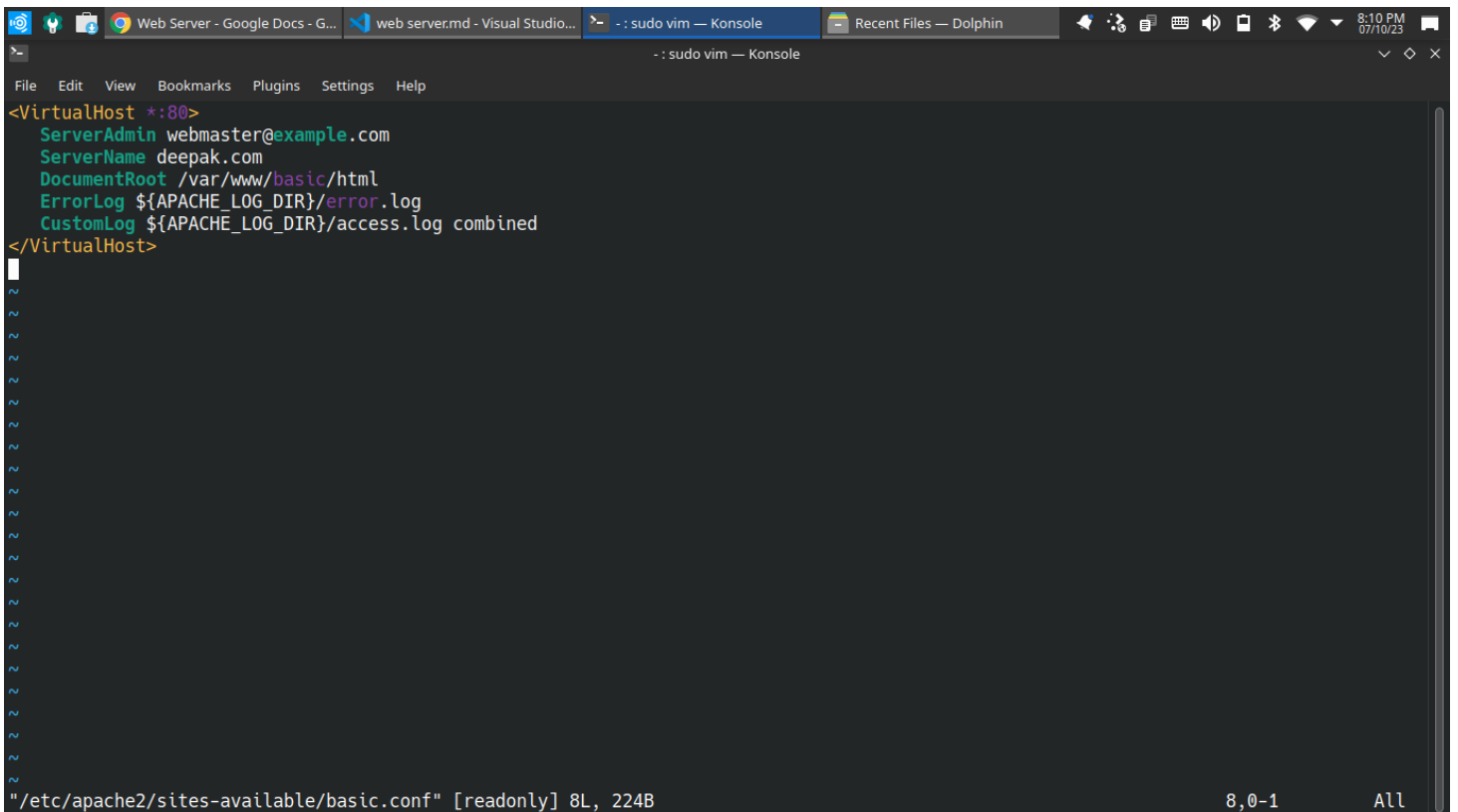
A screenshot of a terminal window with a dark background. The terminal shows the contents of an HTML file being edited in vim. The code is as follows:

```
<!DOCTYPE html>
<html>
<head>
  <title>Welcome To Noida</title>
</head>
<body>
  <h1>Hello Deepak</h1>
  <p>Noida Keen and Able</p>
</body>
</html>
```

The status bar at the bottom indicates the cursor is at line 13, column 1 in the 'INSERT' mode. The window title bar shows 'vim - Konsole'.

#### 4. Create a Virtual Host Configuration File:

- `sudo vim /etc/apache2/sites-available/basic.conf`

A screenshot of a terminal window with a dark background. The terminal shows the contents of a Virtual Host configuration file being edited in vim. The code is as follows:

```
<VirtualHost *:80>
  ServerAdmin webmaster@example.com
  ServerName deepak.com
  DocumentRoot /var/www/basic/html
  ErrorLog ${APACHE_LOG_DIR}/error.log
  CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```

The status bar at the bottom indicates the cursor is at line 8, column 0-1. The window title bar shows 'sudo vim - Konsole'.

Where as:

ServerAdmin	webmaster@example.com	(or add your Email ID)
ServerName	deepak.com	(yourDomainName for web)
DocumentRoot	/var/www/basic/html	(for index.html file path)

## 5. Enable the Virtual Host:

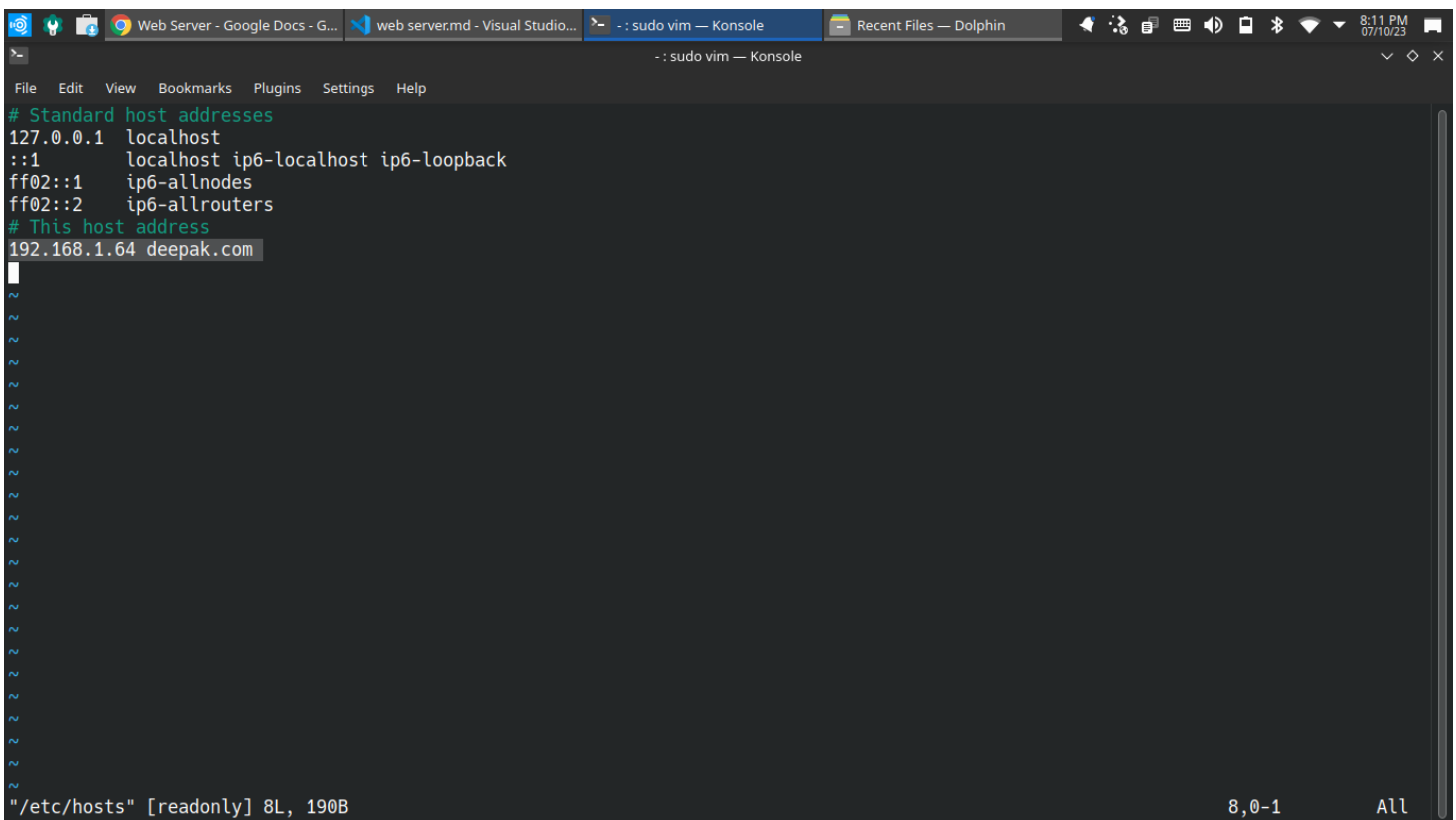
- `sudo a2ensite basic.conf`

## 6. Reload Apache2:

- `sudo systemctl reload apache2`

## 7. Update Hosts File (optional):

- `sudo vim /etc/hosts`

A screenshot of a terminal window with a dark background. The terminal shows the contents of the /etc/hosts file being edited with vim. The file content is as follows:

```
# Standard host addresses
127.0.0.1    localhost
::1         localhost ip6-localhost ip6-loopback
ff02::1     ip6-allnodes
ff02::2     ip6-allrouters

# This host address
192.168.1.64 deepak.com
```

The cursor is positioned at the end of the line "192.168.1.64 deepak.com". The terminal window has a title bar with several open tabs: "Web Server - Google Docs - G...", "web server.md - Visual Studio...", "- : sudo vim — Konsole", and "Recent Files — Dolphin". The status bar at the bottom of the terminal shows the file path "/etc/hosts" [readonly], line 8, column 1, and the total file size 190B.

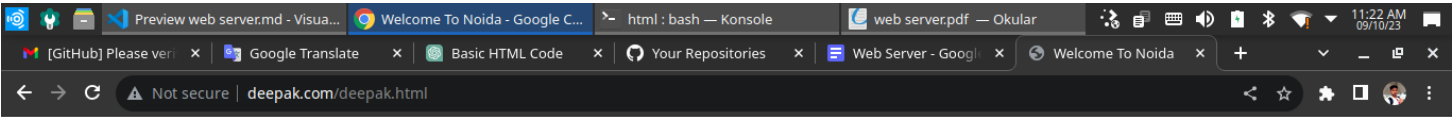
Add This Code Under hosts file in host address:

192.168.1.64 [deepak.com](http://deepak.com/)

Where as:

**192.168.1.64** is your **IP** Address & **deepak.com** is your **DomainName**

Run on Web Browser: <http://deepak.com/>



# Hello Deepak

Noida Keen and Able