

# How To Install the Apache Web Server on Ubuntu 18.04

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## Introduction

The Apache HTTP server is the most widely-used web server in the world. It provides many powerful features including dynamically loadable modules, robust media support, and extensive integration with other popular software.

In this guide, we'll explain how to install an Apache web server on your Ubuntu 18.04 server.

## Prerequisites

Before you begin this guide, you should have a regular, non-root user with sudo privileges configured on your server. Additionally, you will need to enable a basic firewall to block non-essential ports. You can learn how to configure a regular user account and set up a firewall for your server by following our [initial server setup guide for Ubuntu 18.04](#).

When you have an account available, log in as your non-root user to begin.

## Step 1 — Installing Apache

Apache is available within Ubuntu's default software repositories, making it possible to install it using conventional package management tools.

Let's begin by updating the local package index to reflect the latest upstream changes:

```
$ sudo apt update
```

Then, install the `apache2` package:

```
$ sudo apt install apache2
```

After confirming the installation, `apt` will install Apache and all required dependencies.

## Step 2 — Adjusting the Firewall

Before testing Apache, it's necessary to modify the firewall settings to allow outside access to the default web ports. Assuming that you followed the instructions in the prerequisites, you should have a UFW firewall configured to restrict access to your server.

During installation, Apache registers itself with UFW to provide a few application profiles that can be used to enable or disable access to Apache through the firewall.

List the `ufw` application profiles by typing:

```
$ sudo ufw app list
```

You will see a list of the application profiles:

### Output

Available applications:

```
Apache
Apache Full
Apache Secure
OpenSSH
```

As you can see, there are three profiles available for Apache:

- **Apache:** This profile opens only port 80 (normal, unencrypted web traffic)
- **Apache Full:** This profile opens both port 80 (normal, unencrypted web traffic) and port 443 (TLS/SSL encrypted traffic)
- **Apache Secure:** This profile opens only port 443 (TLS/SSL encrypted traffic)

It is recommended that you enable the most restrictive profile that will still allow the traffic you've configured. Since we haven't configured SSL for our server yet in this guide, we will only need to allow traffic on port 80:

```
$ sudo ufw allow 'Apache'
```

You can verify the change by typing:

```
$ sudo ufw status
```

You should see HTTP traffic allowed in the displayed output:

#### Output

Status: active

To	Action	From
--	-----	----
OpenSSH	ALLOW	Anywhere
Apache	ALLOW	Anywhere
OpenSSH (v6)	ALLOW	Anywhere (v6)
Apache (v6)	ALLOW	Anywhere (v6)

As you can see, the profile has been activated to allow access to the web server.

## Step 3 — Checking your Web Server

At the end of the installation process, Ubuntu 18.04 starts Apache. The web server should already be up and running.

Check with the `systemd` init system to make sure the service is running by typing:

```
$ sudo systemctl status apache2
```

#### Output

```
● 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 Tue 2018-04-24 20:14:39 UTC; 9min ago
 Main PID: 2583 (apache2)
    Tasks: 55 (limit: 1153)
   CGroup: /system.slice/apache2.service
           └─2583 /usr/sbin/apache2 -k start
             └─2585 /usr/sbin/apache2 -k start
               └─2586 /usr/sbin/apache2 -k start
```

As you can see from this output, the service appears to have started successfully. However, the best way to test this is to request a page from Apache.

You can access the default Apache landing page to confirm that the software is running properly through your IP address. If you do not know your server's IP address, you can get it a few different ways from the command line.

Try typing this at your server's command prompt:

```
$ hostname -I
```

You will get back a few addresses separated by spaces. You can try each in your web browser to see if they work.

An alternative is typing this, which should give you your public IP address as seen from another location on the internet:

```
$ curl -4 icanhazip.com
```

When you have your server's IP address, enter it into your browser's address bar:

```
http://your_server_ip
```

You should see the default Ubuntu 18.04 Apache web page:



# Apache2 Ubuntu 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
|   |-- *.load
|   |-- *.conf
|-- conf-enabled
|   |-- *.conf
|-- sites-enabled
|   |-- *.conf
```

- `apache2.conf` is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.
- `ports.conf` is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
- Configuration files in the `mods-enabled/`, `conf-enabled/` and `sites-enabled/` directories contain particular configuration snippets which manage modules, global configuration fragments, or virtual host configurations, respectively.
- They are activated by symlinking available configuration files from their respective `*-available/` counterparts. These should be managed by using our helpers `a2enmod`, `a2dismod`, `a2ensite`, `a2dissite`, and `a2enconf`, `a2disconf`. See their respective man pages for detailed information.
- The binary is called `apache2`. Due to the use of environment variables, in the default configuration, `apache2` needs to be started/stopped with `/etc/init.d/apache2` or `apache2ctl`. **Calling `/usr/bin/apache2` directly will not work** with the default configuration.

## Document Roots

By default, Ubuntu does not allow access through the web browser to *any* file apart of those located in `/var/www`, `public_html` directories (when enabled) and `/usr/share` (for web applications). If your site is using a web document root located elsewhere (such as in `/srv`) you may need to whitelist your document root directory in `/etc/apache2/apache2.conf`.

The default Ubuntu document root is `/var/www/html`. You can make your own virtual hosts under `/var/www`. This is different to previous releases which provides better security out of the box.

## Reporting Problems

Please use the `ubuntu-bug` tool to report bugs in the Apache2 package with Ubuntu. However, check [existing bug reports](#) before reporting a new bug.

Please report bugs specific to modules (such as PHP and others) to respective packages, not to the web server itself.

This page indicates that Apache is working correctly. It also includes some basic information about important Apache files and directory locations.

## Step 4 — Managing the Apache Process

Now that you have your web server up and running, let's go over some basic management commands.

To stop your web server, type:

```
$ sudo systemctl stop apache2
```

To start the web server when it is stopped, type:

```
$ sudo systemctl start apache2
```

To stop and then start the service again, type:

```
$ sudo systemctl restart apache2
```

If you are simply making configuration changes, Apache can often reload without dropping connections. To do this, use this command:

```
$ sudo systemctl reload apache2
```

By default, Apache is configured to start automatically when the server boots. If this is not what you want, disable this behavior by typing:

```
$ sudo systemctl disable apache2
```

To re-enable the service to start up at boot, type:

```
$ sudo systemctl enable apache2
```

Apache should now start automatically when the server boots again.

## Step 5 — Setting Up Virtual Hosts (Recommended)

When using the Apache web server, you can use *virtual hosts* (similar to server blocks in Nginx) to encapsulate configuration details and host more than one domain from a single server. We will set up a domain called **example.com**, but you should **replace this with your own domain name**. To learn more about setting up a domain name with DigitalOcean, see our [Introduction to DigitalOcean DNS](#).

Apache on Ubuntu 18.04 has one server block enabled by default that is configured to serve documents from the `/var/www/html` directory. While this works well for a single site, it can become unwieldy if you are

hosting multiple sites. Instead of modifying `/var/www/html`, let's create a directory structure within `/var/www` for our **example.com** site, leaving `/var/www/html` in place as the default directory to be served if a client request doesn't match any other sites.

Create the directory for **example.com** as follows, using the `-p` flag to create any necessary parent directories:

```
sudo mkdir -p /var/www/example.com/html
```

Next, assign ownership of the directory with the `$USER` environmental variable:

```
$ sudo chown -R $USER:$USER /var/www/example.com/html
```

The permissions of your web roots should be correct if you haven't modified your `unmask` value, but you can make sure by typing:

```
$ sudo chmod -R 755 /var/www/example.com
```

Next, create a sample `index.html` page using `nano` or your favorite editor:

```
$ nano /var/www/example.com/html/index.html
```

Inside, add the following sample HTML:

```
                                /var/www/example.com/html/index.html

<html>
  <head>
    <title>Welcome to Example.com!</title>
  </head>
  <body>
    <h1>Success! The example.com server block is working!</h1>
  </body>
</html>
```

Save and close the file when you are finished.

In order for Apache to serve this content, it's necessary to create a virtual host file with the correct directives. Instead of modifying the default configuration file located at `/etc/apache2/sites-available/000-default.conf` directly, let's make a new one at `/etc/apache2/sites-available/example.com.conf`:

```
$ sudo nano /etc/apache2/sites-available/example.com.conf
```

Paste in the following configuration block, which is similar to the default, but updated for our new directory and domain name:

```
                                /etc/apache2/sites-available/example.com.conf

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

Notice that we've updated the `DocumentRoot` to our new directory and `ServerAdmin` to an email that the **example.com** site administrator can access. We've also added two directives: `ServerName`, which establishes the base domain that should match for this virtual host definition, and `ServerAlias`, which defines further names that should match as if they were the base name.

Save and close the file when you are finished.

Let's enable the file with the `a2ensite` tool:

```
$ sudo a2ensite example.com.conf
```

Disable the default site defined in `000-default.conf`:

```
$ sudo a2dissite 000-default.conf
```

Next, let's test for configuration errors:

```
$ sudo apache2ctl configtest
```

You should see the following output:

Output

```
Syntax OK
```

Restart Apache to implement your changes:

```
$ sudo systemctl restart apache2
```



Apache should now be serving your domain name. You can test this by navigating to <http://example.com>, where you should see something like this:

**Success! The example.com virtual host is working!**

## Step 6 – Getting Familiar with Important Apache Files and Directories

Now that you know how to manage the Apache service itself, you should take a few minutes to familiarize yourself with a few important directories and files.

### Content

- `/var/www/html` : The actual web content, which by default only consists of the default Apache page you saw earlier, is served out of the `/var/www/html` directory. This can be changed by altering Apache configuration files.

### Server Configuration

- `/etc/apache2` : The Apache configuration directory. All of the Apache configuration files reside here.
- `/etc/apache2/apache2.conf` : The main Apache configuration file. This can be modified to make changes to the Apache global configuration. This file is responsible for loading many of the other files in the configuration directory.
- `/etc/apache2/ports.conf` : This file specifies the ports that Apache will listen on. By default, Apache listens on port 80 and additionally listens on port 443 when a module providing SSL capabilities is enabled.
- `/etc/apache2/sites-available/` : The directory where per-site virtual hosts can be stored. Apache will not use the configuration files found in this directory unless they are linked to the `sites-enabled` directory. Typically, all server block configuration is done in this directory, and then enabled by linking to the other directory with the `a2ensite` command.
- `/etc/apache2/sites-enabled/` : The directory where enabled per-site virtual hosts are stored. Typically, these are created by linking to configuration files found in the `sites-available` directory with the `a2ensite`. Apache reads the configuration files and links found in this directory when it starts or reloads to compile a complete configuration.
- `/etc/apache2/conf-available/`, `/etc/apache2/conf-enabled/` : These directories have the same relationship as the `sites-available` and `sites-enabled` directories, but are used to store configuration fragments that do not belong in a virtual host. Files in the `conf-available` directory can be enabled with the `a2enconf` command and disabled with the `a2disconf` command.
- `/etc/apache2/mods-available/`, `/etc/apache2/mods-enabled/` : These directories contain the available and enabled modules, respectively. Files ending in `.load` contain fragments to load specific modules, while files ending in `.conf` contain the configuration for those modules. Modules can be enabled and disabled using the `a2enmod` and `a2dismod` command.

# Server Logs

- `/var/log/apache2/access.log` : By default, every request to your web server is recorded in this log file unless Apache is configured to do otherwise.
- `/var/log/apache2/error.log` : By default, all errors are recorded in this file. The `LogLevel` directive in the Apache configuration specifies how much detail the error logs will contain.

## Conclusion

Now that you have your web server installed, you have many options for the type of content you can serve and the technologies you can use to create a richer experience.

If you'd like to build out a more complete application stack, you can look at this article on [how to configure a LAMP stack on Ubuntu 18.04](#).

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# 13 Comments

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 [ansargondal](#) *May 19, 2018*


 1 I have done everything exactly like that but when I access example.com it opens up the example.com website from google.


Although, when I access my localhost(127.0.0.1) it opens up the file which I have places in example.com/html directory!

I'm facing this issue in Ubuntu 18.04, Everything was working fine in ubuntu 16.04.

Can you please explain how I can fix that issue?

---

 [linuxornotlinux](#) *June 13, 2018*

 1 Excellent tutorial, thank you!

After succesfully setting the virtualhost in /etc/apache2/sites-available/example.com.conf you need to manually add 127.0.0.1 example.com to your host file in etc/hosts


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 [ozkanemre](#) *May 27, 2018*


 0 its a good article.Thank you!


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 [premkash](#) *June 16, 2018*

 0 Excellent article. Right amount of content. Well written!

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 [hamizanbaharudin](#) *August 15, 2018*

 0

can i know why i cant open /var/log/apache2 folder.it says permission denied even when i use sudo command.can someone explain it to me?

---

^ [koursala](#) September 21, 2018

0 Dear Kathleen, dear Justin,

thank you for your helpful documentation.

We have different servers with different subdomains in our network and I need a SSL certificate only for one subdomain, e.g, <https://ww8.unidi.com/>

What should be changed here?

BR,

---

^ [zeokat](#) October 12, 2018

0 Are you sure that you the part of the tutorial that says **Next, assign ownership of the directory with the \$USER environmental variable** is secure?

This comand assigns root as user and i'm not sure if that is correct. Not will be better use www-data user?

---

^ [aubzp](#) October 22, 2018

0 Virtual directory server block instructions failed over permissions when accessing from web. This line `sudo chmod -R 755 /var/www/example.com` didnt work for me. Added /html to the end and it worked.

```
sudo chmod -R 755 /var/www/example.com/html
```

---

^ [harpmuhendisi](#) October 28, 2018

0 if you are stuck at something like this

lines 1-14/14 (end)

then press shift-q

it will return you to the terminal

---

^ [mikewooz](#) November 9, 2018

0 Hello, hoping all are well and good.

I followed along the tutorial and when I got to the part where I enabled the new site and disabled the default site, I still get the html page from the default site... not the shortened version sitting in my virtual domain. I noted what was said by ansargondal below in the comment section and ensured that I added the line `127.0.0.1 mydomainName (the directory name @ /etc/apache2/sites-available/mydomainName)`. Also,

I'm thinking that I can name my directory in the sites-available folder to whatever I want, without a .com or other extension. My structure is /etc/apache2/sites-available/myVirtualSite/html. Again, I tried both ways just in case it mattered. What should be in the hosts file as that might be where my problem is.

---

^ freechargej1 November 29, 2018

0 i have followed above steps and successfully created virtual hosts and added **two domain names** both are working fine **without www but when i open www.domain1.com website is not working where as domain1.com is working fine.**

**i have another problem** if i open my ipaddress i am getting contents on my **1st domain name** which i have added under **var/www/domain1/html** but i want files which are **under var/www/html**

---

^ ktcw November 29, 2018

0 You'll have to ensure that you've set **ServerAlias www.domain1.com** in your virtual host's settings, located in the **/etc/apache/sites-available/** directory.

You can also change the virtual host's main directory from there.

It'll be great if you can post a snippet of the configuration file you have right now.

---

^ ifjtoledo December 23, 2018

0 So **good article**, just was **i needed**, thanks a lot all works fine!



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