


[OPENSSL \(/BLOG/TAG/OPENSSL/\)](#)[UBUNTU \(/BLOG/TAG/UBUNTU/\)](#)

Installing OpenSSL on Ubuntu 16.04/18.04

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OpenSSL (<https://www.openssl.org>) is a robust, commercial-grade, and full-featured toolkit for the Transport Layer Security (TLS) and Secure Sockets Layer (SSL) protocols. It is also a general-purpose cryptography library.

OpenSSL is used by many programs like **Apache Web server** (<https://cloudwafer.com/blog/managing-apache-web-server-on-ubuntu-and-centos/>), **PHP** (<https://cloudwafer.com/blog/installing-multiple-versions-of-php-on-centos/>), and many others providing support for various cryptographic algorithms such as ciphers (AES, Blowfish, DES, IDEA etc.), and cryptographic hash functions (MD5, MD4, SHA-1, SHA-2 etc.)


In this guide, we are going to install the latest version of OpenSSL on Ubuntu 16.04/18.04.

Deploying your cloud server

If you have not already registered with **Cloudwafer** (<https://cloudwafer.com>), you should begin by getting **signed up** (<https://my.cloudwafer.com/?cmd=cloudsignup>). Take a moment to create an account after which you can easily deploy your own cloud servers.

Once you have signed up, log into your **Cloudwafer Client Area** (<https://my.cloudwafer.com/?cmd=login>) with the password provided in your mail and deploy your **Cloudwafer**

(<https://cloudwafer.com>) cloud server.

 **CloudWafer** (<https://cloudwafer.com/>)
Updating System Packages

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It is always recommended that you update the system to the latest packages before beginning any major installations. This is done with the command below:

```
sudo apt-get update && sudo apt-get upgrade
```

Before we begin our installation, you can check the version of OpenSSL installed on your server by issuing the command below:

```
openssl version -a
```

```
ayo@cloudwaferlabs:~$ openssl version -a
OpenSSL 1.1.0h 27 Mar 2018 (Library: OpenSSL 1.1.1c 28 May 2019)
built on: Fri May 31 12:25:41 2019 UTC
platform: debian-amd64
```

Step 1: Install the necessary packages for compiling

Issue the command below to install the necessary packages for compilation:

```
sudo apt install build-essential checkinstall zlib1g-dev -y
```

```
ayo@cloudwaferlabs:~$ sudo apt install build-essential checkinstall zlib1g-dev -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

Step 2: Download OpenSSL

Next, we are going to download OpenSSL from the source (getting the latest version which at the time of writing this guide, the latest stable version is the 1.1.1 series).

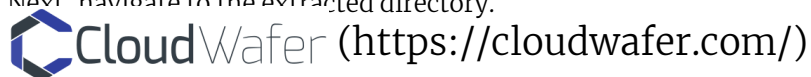
```
cd /usr/local/src/
sudo wget https://www.openssl.org/source/openssl-1.1.1c.tar.gz
```

```
ayo@cloudwaferlabs:~$ cd /usr/local/src/
ayo@cloudwaferlabs:/usr/local/src$ sudo wget https://www.openssl.org/source/openssl-1.1.1c.tar.gz
--2019-07-02 13:30:10-- https://www.openssl.org/source/openssl-1.1.1c.tar.gz
Resolving www.openssl.org (www.openssl.org)... 104.83.22.211, 2a02:26f0:7400:195::c1e, 2a02:26f0:7400:187::c1e
Connecting to www.openssl.org (www.openssl.org)|104.83.22.211|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 8864262 (8.5M) [application/x-gzip]
Saving to: 'openssl-1.1.1c.tar.gz'
```

Next, extract the downloaded file using the command below:

```
sudo tar -xf openssl-1.1.1c.tar.gz
```

Next, navigate to the extracted directory.



```
cd openssl-1.1.1c
```

```
ayo@cloudwaferlabs:/usr/local/src$ sudo tar -xvf openssl-1.1.1c.tar.gz
[sudo] password for ayo:
ayo@cloudwaferlabs:/usr/local/src$ cd openssl-1.1.1c
ayo@cloudwaferlabs:/usr/local/src/openssl-1.1.1c$ pwd
/usr/local/src/openssl-1.1.1c
ayo@cloudwaferlabs:/usr/local/src/openssl-1.1.1c$
```

Step 3: Install OpenSSL

We are now going to install the latest version of OpenSSL which we downloaded using the command below:

```
sudo ./config --prefix=/usr/local/ssl --openssldir=/usr/local/ssl shared
d zlib
```

```
ayo@cloudwaferlabs:/usr/local/src/openssl-1.1.1c$ sudo ./config --prefix=/usr/local/ssl --openssldir=/usr/local/ssl shared zlib
Operating system: x86_64-ubuntu-linux2
Configuring OpenSSL version 1.1.1c (0x1010103fL) for linux-x86_64
Using os-specific seed configuration
Creating configdata.pm
Creating Makefile
*****
***                               ***
***   OpenSSL has been successfully configured   ***
***                               ***
***   If you encounter a problem while building, please open an ***
***   issue on GitHub <https://github.com/openssl/openssl/issues> ***
***   and include the output from the following command: ***
***                               ***
***       perl configdata.pm --dump ***
***                               ***
***   (If you are new to OpenSSL, you might want to consult the ***
***   'Troubleshooting' section in the INSTALL file first) ***
***                               ***
*****
ayo@cloudwaferlabs:/usr/local/src/openssl-1.1.1c$
```

```
sudo make
sudo make test
sudo make install
```

Step 4: Configure OpenSSL Shared Libraries

Navigate to the `/etc/ld.so.conf.d` directory and create a new configuration file 'openssl-1.1.1c.conf'.

```
cd /etc/ld.so.conf.d/
sudo nano openssl-1.1.1c.conf
```

```
ayo@cloudwaferlabs:/usr/local/src/openssl-1.1.1c$ cd /etc/ld.so.conf.d/
ayo@cloudwaferlabs:/etc/ld.so.conf.d$ sudo nano openssl-1.1.1c.conf
ayo@cloudwaferlabs:/etc/ld.so.conf.d$ sudo ldconfig -v
```

Enter the following:

```
/usr/local/ssl/lib
```

```
GNU nano 2.5.3 File: openssl-1.1.1c.conf
CloudWafer
```

Ensure to save before you exit.

Next, reload the dynamic link by issuing the command below:

```
sudo ldconfig -v
```

Step 5: Configure OpenSSL Binary

In our final configuration, we are going to insert the binary of our new version of OpenSSL installed (located at `/usr/local/ssl/bin/openssl`) to replace the default openssl binary (located at `/usr/bin/openssl` or `/bin/openssl`).

First, carry out a backup of the binary files.

```
sudo mv /usr/bin/c_rehash /usr/bin/c_rehash.backup
sudo mv /usr/bin/openssl /usr/bin/openssl.backup
```

```
ayo@cloudwaferlabs:~$ sudo mv /usr/bin/c_rehash /usr/bin/c_rehash.backup
ayo@cloudwaferlabs:~$ sudo mv /usr/bin/openssl /usr/bin/openssl.backup
ayo@cloudwaferlabs:~$
```

Next, edit the `/etc/environment` file using vim.

```
sudo nano /etc/environment
```

Insert the following:

```
PATH="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/usr/local/ssl/bin"
```

```
GNU nano 2.5.3 File: /etc/environment
PATH="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/usr/local/ssl/bin"
```

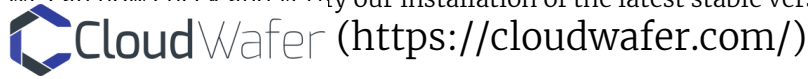
Ensure to save before you exit.

Next, reload the OpenSSL environment and check the PATH bin directory using commands below:

```
source /etc/environment
echo $PATH
```

```
ayo@cloudwaferlabs:~$ source /etc/environment
ayo@cloudwaferlabs:~$ echo $PATH
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/usr/local/ssl/bin
ayo@cloudwaferlabs:~$
```

We can now check and verify our installation of the latest stable version of OpenSSL using



which openssl
openssl version -a

```
ayo@cloudwaferlabs:~$ which openssl
/usr/local/ssl/bin/openssl
ayo@cloudwaferlabs:~$ openssl version -a
OpenSSL 1.1.1c  28 May 2019
built on: Tue Jul  2 12:40:11 2019 UTC
platform: linux-x86_64
```

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