How To Install Java with `apt` on Ubuntu 18.04

Updated September 6, 2018 1.4m JAVA UBUNTU 18.04

By Koen Vlaswinkel
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Introduction

Java and the JVM (Java's virtual machine) are required for many kinds of software, including Tomcat, Jetty, Glassfish, Cassandra and Jenkins.

In this guide, you will install various versions of the Java Runtime Environment (JRE) and the Java Developer Kit (JDK) using `apt` . You'll install OpenJDK as well as official packages from Oracle. You'll then select the version you wish to use for your projects. When you're finished, you'll be able to use the JDK to develop software or use the Java Runtime to run software.

Prerequisites

To follow this tutorial, you will need:

- One Ubuntu 18.04 server set up by following the the Ubuntu 18.04 initial server setup guide tutorial, including a sudo non-root user and a firewall.

Installing the Default JRE/JDK

The easiest option for installing Java is to use the version packaged with Ubuntu. By default, Ubuntu 18.04 includes Open JDK, which is an open-source variant of the JRE and JDK.

This package will install either OpenJDK 10 or 11.

- Prior to September 2018, this will install OpenJDK 10.
- After September 2018, this will install OpenJDK 11.

To install this version, first update the package index:

```
$ sudo apt update
```

Next, check if Java is already installed:

```
$ java -version
```

If Java is not currently installed, you'll see the following output:

```
Output
Command 'java' not found, but can be installed with:

apt install default-jre
apt install openjdk-11-jre-headless
apt install openjdk-8-jre-headless
apt install openjdk-9-jre-headless
```

Execute the following command to install OpenJDK:

```
$ sudo apt install default-jre
```

This command will install the Java Runtime Environment (JRE). This will allow you to run almost all Java software.

Verify the installation with:

```
$ java -version
```

You'll see the following output:

```
Output
openjdk version "10.0.1" 2018-04-17
OpenJDK Runtime Environment (build 10.0.1+10-Ubuntu-3ubuntu1)
OpenJDK 64-Bit Server VM (build 10.0.1+10-Ubuntu-3ubuntu1, mixed mode)
```

You may need the Java Development Kit (JDK) in addition to the JRE in order to compile and run some specific Java-based software. To install the JDK, execute the following command, which will also install the JRE:

```
$ sudo apt install default-jdk
```

Verify that the JDK is installed by checking the version of `javac`, the Java compiler:

```
$ javac -version
```

You'll see the following output:

```
Output
javac 10.0.1
```

Next, let's look at specifying which OpenJDK version we want to install.

Installing Specific Versions of OpenJDK

While you can install the default OpenJDK package, you can also install different versions of OpenJDK.

OpenJDK 8

Java 8 is the current Long Term Support version and is still widely supported, though public maintenance ends in January 2019. To install OpenJDK 8, execute the following command:

```
$ sudo apt install openjdk-8-jdk
```

Verify that this is installed with

```
$ java -version
```

You'll see output like this:

```
Output
openjdk version "1.8.0_162"
OpenJDK Runtime Environment (build 1.8.0_162-8u162-b12-1-b12)
OpenJDK 64-Bit Server VM (build 25.162-b12, mixed mode)
```

It is also possible to install only the JRE, which you can do by executing `sudo apt install openjdk-8-jre`.

OpenJDK 10/11

Ubuntu's repositories contain a package that will install either Java 10 or 11. Prior to September 2018, this package will install OpenJDK 10. Once Java 11 is released, this package will install Java 11.

To install OpenJDK 10/11, execute the following command:

```
$ sudo apt install openjdk-11-jdk
```

To install the JRE only, use the following command:

```
$ sudo apt install openjdk-11-jre
```

Next, let's look at how to install Oracle's official JDK and JRE.

Installing the Oracle JDK

If you want to install the Oracle JDK, which is the official version distributed by Oracle, you'll need to add a new package repository for the version you'd like to use.

To install Java 8, which is the latest LTS version, first add its package repository:

```
$ sudo add-apt-repository ppa:webupd8team/java
```

When you add the repository, you'll see a message like this:

```
output
 Oracle Java (JDK) Installer (automatically downloads and installs Oracle JDK8). There are
a files in this PPA.

Important -> Why Oracle Java 7 And 6 Installers No Longer Work: http://www.webupd8.org/2017
e-java-7-and-6-installers-no.html

Update: Oracle Java 9 has reached end of life: http://www.oracle.com/technetwork/java/javas
dk9-downloads-3848520.html

The PPA supports Ubuntu 18.04, 17.10, 16.04, 14.04 and 12.04.

More info (and Ubuntu installation instructions):
- for Oracle Java 8: http://www.webupd8.org/2012/09/install-oracle-java-8-in-ubuntu-via-ppa

Debian installation instructions:
- Oracle Java 8: http://www.webupd8.org/2014/03/how-to-install-oracle-java-8-in-debian.html

For Oracle Java 10, see a different PPA: https://www.linuxuprising.com/2018/04/install-orac

More info: https://launchpad.net/~webupd8team/+archive/ubuntu/java
Press [ENTER] to continue or Ctrl-c to cancel adding it.
```

Press `ENTER` to continue. Then update your package list:

```
$ sudo apt update
```

Once the package list updates, install Java 8:

```
$ sudo apt install oracle-java8-installer
```

Your system will download the JDK from Oracle and ask you to accept the license agreement. Accept the agreement and the JDK will install.

Now let's look at how to select which version of Java you want to use.

Managing Java

You can have multiple Java installations on one server. You can configure which version is the default for use on the command line by using the `update-alternatives` command.

```
$ sudo update-alternatives --config java
```

This is what the output would look like if you've installed all versions of Java in this tutorial:

```
Output
There are 3 choices for the alternative java (providing /usr/bin/java).

  Selection    Path                                            Priority   Status
------------------------------------------------------------
* 0            /usr/lib/jvm/java-11-openjdk-amd64/bin/java      1101      auto mode
  1            /usr/lib/jvm/java-11-openjdk-amd64/bin/java      1101      manual mode
  2            /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/java   1081      manual mode
  3            /usr/lib/jvm/java-8-oracle/jre/bin/java          1081      manual mode
```

Choose the number associated with the Java version to use it as the default, or press `ENTER` to leave the current settings in place.

You can do this for other Java commands, such as the compiler (`javac`):

```
$ sudo update-alternatives --config javac
```

Other commands for which this command can be run include, but are not limited to: `keytool`, `javadoc` and `jarsigner`.

Setting the `JAVA_HOME` Environment Variable

Many programs written using Java use the `JAVA_HOME` environment variable to determine the Java installation location.

To set this environment variable, first determine where Java is installed. Use the `update-alternatives` command:

```
$ sudo update-alternatives --config java
```

This command shows each installation of Java along with its installation path:

```
Output
There are 3 choices for the alternative java (providing /usr/bin/java).

  Selection    Path                                            Priority   Status
------------------------------------------------------------
* 0            /usr/lib/jvm/java-11-openjdk-amd64/bin/java      1101      auto mode
  1            /usr/lib/jvm/java-11-openjdk-amd64/bin/java      1101      manual mode
  2            /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/java   1081      manual mode
  3            /usr/lib/jvm/java-8-oracle/jre/bin/java          1081      manual mode

Press <enter> to keep the current choice[*], or type selection number:
```

In this case the installation paths are as follows:

1. OpenJDK 11 is located at `/usr/lib/jvm/java-11-openjdk-amd64/bin/java.`
2. OpenJDK 8 is located at `/usr/lib/jvm/java-8-openjdk-amd64/jre/bin/java`.
3. Oracle Java 8 is located at `/usr/lib/jvm/java-8-oracle/jre/bin/java`.

Copy the path from your preferred installation. Then open `/etc/environment` using `nano` or your favorite text editor:

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

At the end of this file, add the following line, making sure to replace the highlighted path with your own copied path:

/etc/environment

```
JAVA_HOME="/usr/lib/jvm/java-11-openjdk-amd64/bin/"
```

Modifying this file will set the `JAVA_HOME` path for all users on your system.

Save the file and exit the editor.

Now reload this file to apply the changes to your current session:

```
$ source /etc/environment
```

Verify that the environment variable is set:

```
$ echo $JAVA_HOME
```

You'll see the path you just set:

```
Output
/usr/lib/jvm/java-11-openjdk-amd64/bin/
```

Other users will need to execute the command `source /etc/environment` or log out and log back in to apply this setting.

Conclusion

In this tutorial you installed multiple versions of Java and learned how to manage them. You can now install software which runs on Java, such as Tomcat, Jetty, Glassfish, Cassandra or Jenkins.

By Koen Vlaswinkel

Editor: Brian Hogan

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peshomorad May 15, 2018

3

Thanks Koen,

But the $JAVA_HOME should be `/usr/lib/jvm/java-11-openjdk-amd64/`
So in case of using Oracle Java 8 it would be

```
JAVA_HOME=/usr/lib/jvm/java-8-oracle/
```

Reply Report

> **andriirubtsov** December 14, 2019
>
> 0
>
> Exactly! “bin” should be removed. Smth like:
> export JAVA_HOME=“/usr/lib/jvm/java-11-openjdk-amd64/”
>
> Reply Report

ozkanemre May 27, 2018

0

its a good and very useful thank you!

edited by MattIPv4

Reply Report

pravayest June 2, 2018

0

Thanks. Very useful article

Reply Report

JavierC August 31, 2018

Thanks!
It is very useful.

0

Reply Report

rogerdeku September 21, 2018

it works thank you

0

Reply Report

sfarmer88 October 16, 2018

This happened. Not sure how to proceed.

–2018-10-16 15:01:26– http://download.oracle.com/otn-pub/java/jdk/8u181-b13/96a7b8442fe848ef90c96a2fad6ed6d1/jdk-8u181-linux-x64.tar.gz?AuthParam=1539716606_e0a913d67b440504da28a61c62775de6
Connecting to download.oracle.com (download.oracle.com)|23.36.32.122|:80... connected.
HTTP request sent, awaiting response... 404 Not Found
2018-10-16 15:01:26 ERROR 404: Not Found.

download failed
Oracle JDK 8 is NOT installed.
dpkg: error processing package oracle-java8-installer (–configure):
installed oracle-java8-installer package post-installation script subprocess returned error exit status 1
E: Sub-process /usr/bin/dpkg returned an error code (1)

Cheers,
Steve

0

Reply Report

zozo36769 October 27, 2018

thanks

0

Reply Report

abajric1 January 24, 2019

I have downloaded, extracted and set path variable for Zulu Java platform, but when i run $sudo update-alternatives –config java there is no Zulu version. Do you know what could i have done wrong?

PATH="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games jdk8.0.163-linux*x64/bin"*
*JAVA*HOME="/usr/lib/jvm/zulu8.28.0.1-jdk8.0.163-linux_x64"

There are 2 choices for the alternative java (providing /usr/bin/java).

0

Selection Path Priority Status

0 /usr/lib/jvm/java-11-openjdk-amd64/bin/java 1101 auto mode
1 /usr/lib/jvm/java-11-openjdk-amd64/bin/java 1101 manual mode

- 2 /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/java 1081 manual mode

Reply Report

SixOThree January 24, 2019
0
This article fails to mention a default install of Ubuntu 18.04 will not source /etc/environment by default.

You need to add the following line to .bashrc
source /etc/environment

Please add to the guide.

Reply Report

> abajric1 January 25, 2019
> 0
> I have added source /etc/environment at the start of bash.bashrc file but again cant recognize Zulu. Thanks.
>
> Reply Report

kylianfornadout February 15, 2019
0
Thanks, that's pretty helpful

Reply Report

teward001 April 29, 2019
4
The WebUpd8 PPA for Oracle Java in this tutorial is **no longer supported** since Oracle changed licensing and requires a login for downloads.

To that end, that PPA now 404s if anyone adds it. **This tutorial is thus EXTREMELY out of date and needs updated with manual installation mechanisms for Oracle Java.**

Reply Report

ankushsihag012 June 19, 2019
0
awesome post

edited by MattIPv4

Reply Report

2936837958 July 8, 2019
0

Thanks!
It helps me a lot!

Reply Report

sshniro July 15, 2019

3

Oracle has discontinued the ppa. So getting the following issue:

```
This may mean that the package is missing, has been obsoleted, or
is only available from another source

E: Package 'oracle-java8-installer' has no installation candidate
```

Reply Report

koustav July 17, 2019

0

Thanks,save my valuable time.

Reply Report

newskooler July 17, 2019

1

Please update this tutorial. The installation of `oracle-java8-installer` is super outdated and not working.

Reply Report

rakeshmali July 22, 2019

2

Not working getting error

```
sudo apt install oracle-java8-installer
Reading package lists... Done
Building dependency tree
Reading state information... Done
Package oracle-java8-installer is not available, but is referred to by another pack
This may mean that the package is missing, has been obsoleted, or
is only available from another source

E: Package 'oracle-java8-installer' has no installation candidate
```

Any other way to install java on ubuntu 18.04. I just want to intall elasticsearch

Reply Report

odahcam July 25, 2019

I'm not able to install Oracle's official JDK dist.

0 Reply Report

kravs October 16, 2019

0 Tutorial needs to be updated) Oracle changed PPA)

Reply Report

vanderbaker November 17, 2019

6 This PPA is outdated. If you're trying to install Elasticsearch and run into the `E: Package 'oracle-java8-installer' has no installation candidate` message. The following will help you:

```
# Remove old ppa, hit ENTER to confirm
sudo add-apt-repository --remove ppa:webupd8team/java

# Install valid ppa and install Java 8
sudo apt install apt-transport-https && sudo apt update && sudo apt install -y open

# Version check
java -version
```

The output should be something like:

```
openjdk version "1.8.0_222"
OpenJDK Runtime Environment (build 1.8.0_222-8u222-b10-1ubuntu1~18.04.1-b10)
OpenJDK 64-Bit Server VM (build 25.222-b10, mixed mode)
```

Cheers!

Reply Report

> **zachgoll** February 25, 2020
>
> 1 Thanks for this comment! This tutorial definitely is due for an update.
>
> Reply Report

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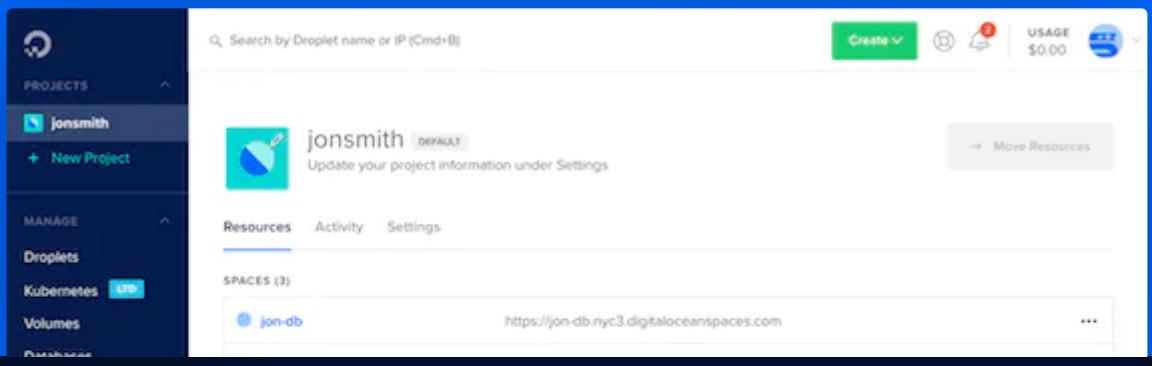

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