

How To Install Apache Tomcat 9 On Ubuntu 18.04

Posted July 2, 2019

UBUNTU

JAVA

APACHE

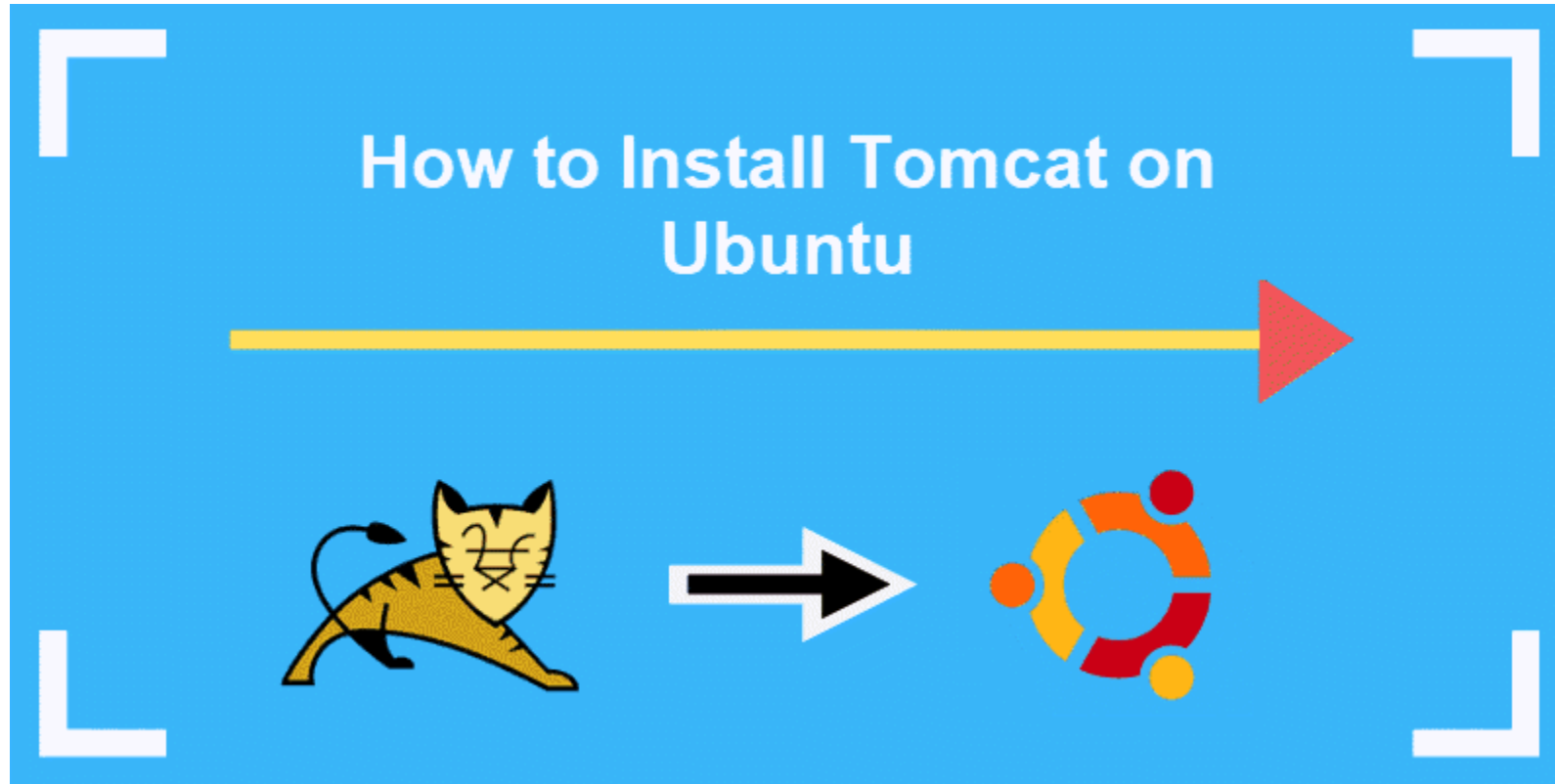
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Introduction

Apache Tomcat is a free, open-source, lightweight application server used for Java-based web applications.



Read this guide to learn how to install and configure Apache Tomcat on Ubuntu 18.04.





Elementary OS.

Prerequisites

- An Ubuntu-based distribution (such as Ubuntu 18.04)
- A user account with **sudo** privileges
- A terminal window (**Ctrl–Alt–T**)
- The apt package manager, included by default

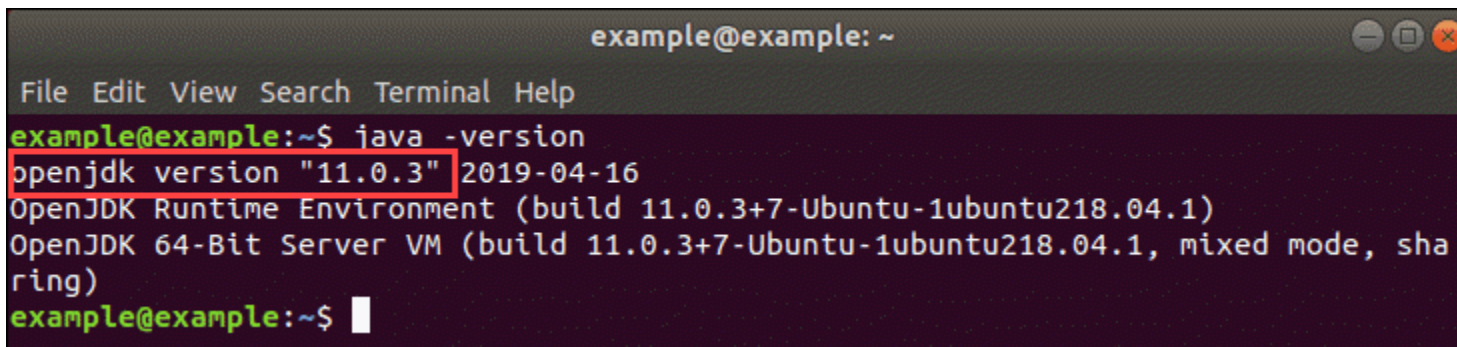
Steps for Installing Tomcat 9 on Ubuntu

Check if Java is Installed



```
java -version
```

The output will show the Java version running on your system. Currently, the latest release is **OpenJDK 11.0.3**:

A screenshot of a terminal window titled 'example@example: ~'. The terminal shows the command 'java -version' being executed. The output is: 'openjdk version "11.0.3" 2019-04-16', 'OpenJDK Runtime Environment (build 11.0.3+7-Ubuntu-1ubuntu218.04.1)', and 'OpenJDK 64-Bit Server VM (build 11.0.3+7-Ubuntu-1ubuntu218.04.1, mixed mode, sharing)'. The first line of the output is highlighted with a red box. The prompt 'example@example:~\$' is visible at the bottom.

```
example@example: ~
File Edit View Search Terminal Help
example@example:~$ java -version
openjdk version "11.0.3" 2019-04-16
OpenJDK Runtime Environment (build 11.0.3+7-Ubuntu-1ubuntu218.04.1)
OpenJDK 64-Bit Server VM (build 11.0.3+7-Ubuntu-1ubuntu218.04.1, mixed mode, sha
ring)
example@example:~$
```

Install OpenJDK

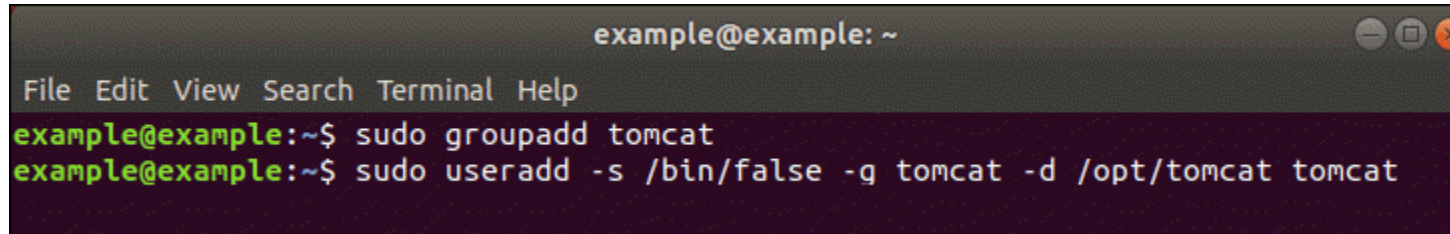
If you do not have OpenJDK or have a version older than Java 8, install the newest release by typing the following:



For security reasons, do not run Tomcat under the root user. Create a new group and system user to run the Apache Tomcat service from the `/opt/tomcat` directory.

```
sudo groupadd tomcat
```

```
sudo useradd -s /bin/false -g tomcat -d /opt/tomcat tomcat
```

A screenshot of a Linux terminal window. The window title is "example@example: ~". The menu bar shows "File Edit View Search Terminal Help". The terminal shows two commands being executed: "sudo groupadd tomcat" and "sudo useradd -s /bin/false -g tomcat -d /opt/tomcat tomcat". Both commands are preceded by a green prompt "example@example:~\$".

```
example@example: ~
File Edit View Search Terminal Help
example@example:~$ sudo groupadd tomcat
example@example:~$ sudo useradd -s /bin/false -g tomcat -d /opt/tomcat tomcat
```

Download Tomcat 9





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Problems?

Tomcat 9 Software Downloads

Welcome to the Apache Tomcat® 9.x software download page. This page provides do

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Release Integrity

You **must** [verify](#) the integrity of the downloaded files. We provide OpenPGP signature checksums for every release file. After you download the file, you should calculate a

Mirrors

You are currently using <https://www-us.apache.org/dist/>. If you encounter a probl

Other mirrors:

9.0.20

Please see the [README](#) file for packaging information. It explains what every distribu

Binary Distributions

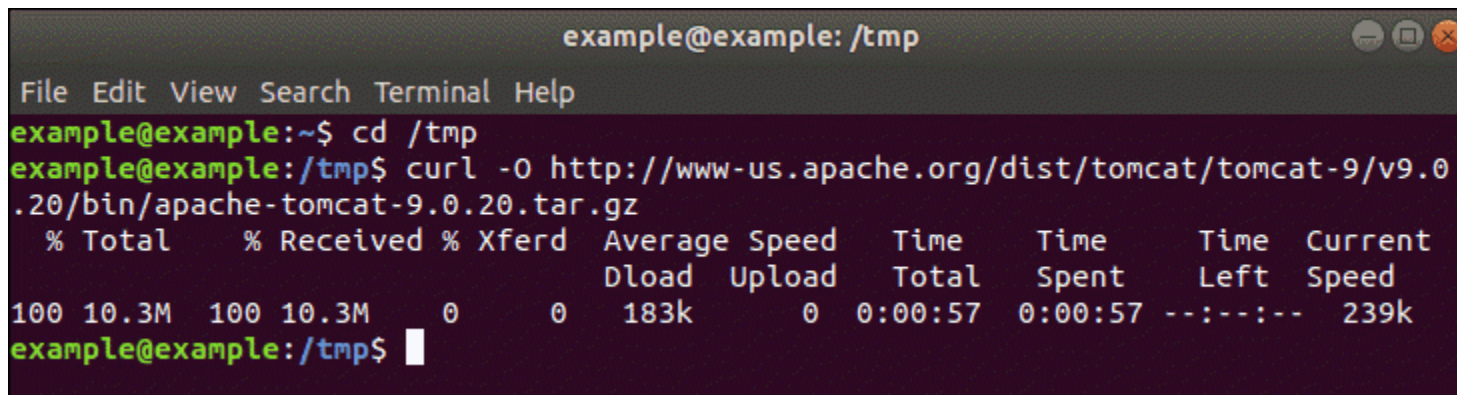
- Core:
 - [zip \(pgp, sha512\)](#)
 - [tar.gz \(pgp, sha512\)](#)
 - [32-bit Windows zip \(pgp, sha512\)](#)
 - [64-bit Windows zip \(pgp, sha512\)](#)
 - [32-bit/64-bit Windows Self-Extractor Installer \(pgp, sha512\)](#)



```
cd /tmp
```

4. Now, use the **curl** command with the **tar.gz** link you copied in step 2 to download the package:

```
curl -O http://www-us.apache.org/dist/tomcat/tomcat-9/v9.0.20/bin/apache-tomcat-9.0.20.tar.gz
```



A terminal window titled "example@example: /tmp" with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following commands and output:

```
example@example:~$ cd /tmp
example@example:/tmp$ curl -O http://www-us.apache.org/dist/tomcat/tomcat-9/v9.0.20/bin/apache-tomcat-9.0.20.tar.gz
```

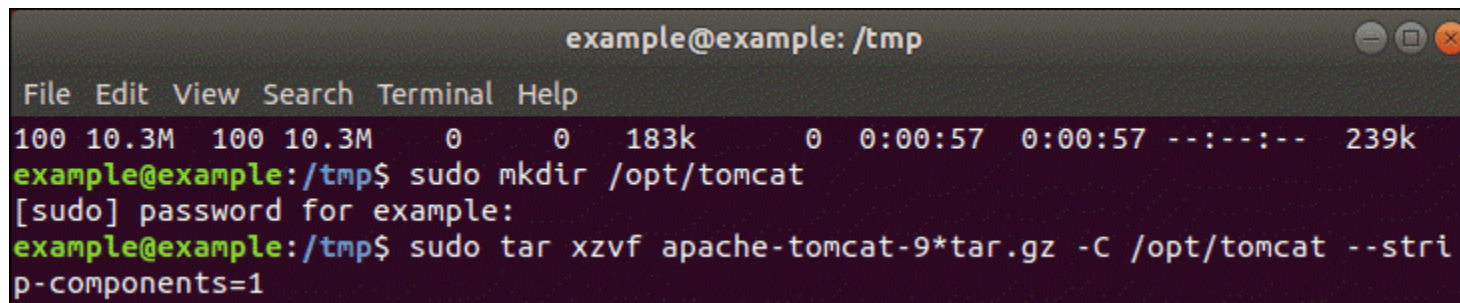
% Total	% Received	% Xferd	Average Speed	Time	Time	Time	Current				
			Dload Upload	Total	Spent	Left	Speed				
100	10.3M	100	10.3M	0	0	183k	0	0:00:57	0:00:57	--:--:--	239k

```
example@example:/tmp$
```

```
sudo mkdir /opt/tomcat
```

2. Then, extract the file in the new directory with the following command:

```
sudo tar xzvf apache-tomcat-9*tar.gz -C /opt/tomcat --strip-components=1
```

A terminal window titled 'example@example: /tmp' with standard window controls. It shows a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. Below the menu is a table with 12 columns: 4 for file size (100, 10.3M, 100, 10.3M), 2 for permissions (0, 0), 2 for file size (183k, 0), 2 for time (0:00:57, 0:00:57), 2 for status (>--:--:--), and 1 for file size (239k). The terminal shows the command 'example@example:/tmp\$ sudo mkdir /opt/tomcat' followed by a password prompt '[sudo] password for example:'. Then, it shows 'example@example:/tmp\$ sudo tar xzvf apache-tomcat-9*tar.gz -C /opt/tomcat --strip-components=1'.

Modify Tomcat User Permission



directory. You need to setup execute privileges over the directory.

1. Move to the directory where the Tomcat installation is located:

```
cd /opt/tomcat
```

2. Grant group ownership over the installation directory to the **tomcat** group with the command:

```
sudo chgrp -R tomcat /opt/tomcat
```

3. Also, give it read access to the **conf** directory and its contents by typing:

```
sudo chmod -R g+r conf
```

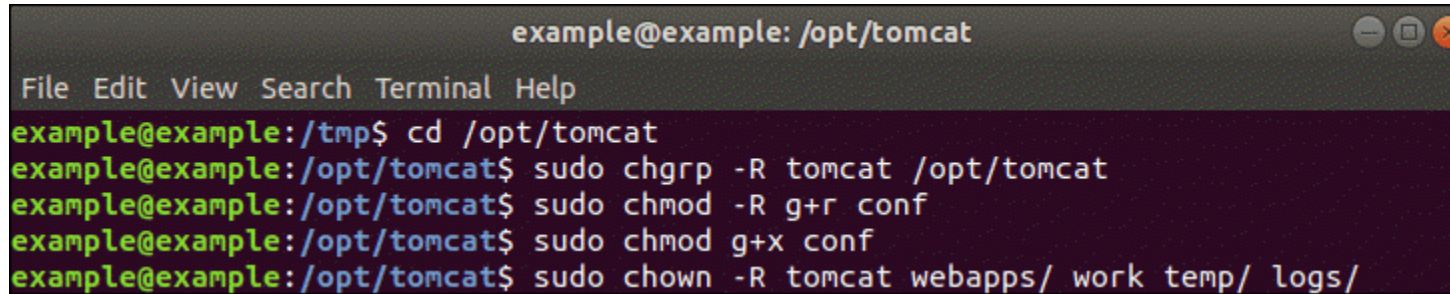
4. Followed by [changing directory permissions](#) to grant execute access with:



```
sudo chmod g+x conf
```

5. Finally, give the tomcat user ownership of the **webapps** , **work** , **temp** , and **logs** directories using the command:

```
sudo chown -R tomcat webapps/ work temp/ logs
```

A terminal window titled 'example@example: /opt/tomcat' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following commands and output:

```
example@example:/tmp$ cd /opt/tomcat
example@example:/opt/tomcat$ sudo chgrp -R tomcat /opt/tomcat
example@example:/opt/tomcat$ sudo chmod -R g+r conf
example@example:/opt/tomcat$ sudo chmod g+x conf
example@example:/opt/tomcat$ sudo chown -R tomcat webapps/ work temp/ logs/
```

Create System Unit File

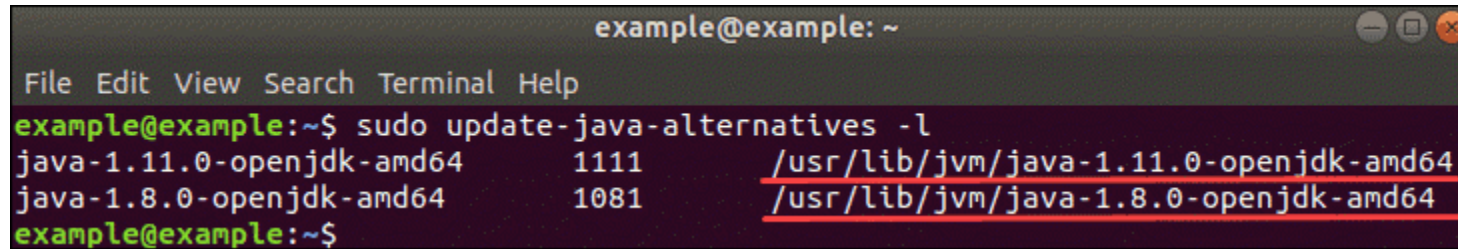
Since you are going to use Tomcat as a service, you need to create a **systemd service file**.



package.

To do so, prompt the system to give you information about the Java packages installed on the system. In the terminal, type:

```
sudo update-java-alternatives -l
```

A terminal window titled 'example@example: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The command 'example@example:~\$ sudo update-java-alternatives -l' has been executed. The output shows two Java versions: 'java-1.11.0-openjdk-amd64' with priority '1111' and path '/usr/lib/jvm/java-1.11.0-openjdk-amd64', and 'java-1.8.0-openjdk-amd64' with priority '1081' and path '/usr/lib/jvm/java-1.8.0-openjdk-amd64'. The paths are underlined in red. The prompt 'example@example:~\$' is shown at the bottom.

java-1.11.0-openjdk-amd64	1111	<u>/usr/lib/jvm/java-1.11.0-openjdk-amd64</u>
java-1.8.0-openjdk-amd64	1081	<u>/usr/lib/jvm/java-1.8.0-openjdk-amd64</u>

As the output shows, there are two available versions of Java. Accordingly, it also shows two paths displaying their location.

Choose the version you want to use and copy its location. With that, you can move on to create the service file.



```
sudo nano /etc/systemd/system/tomcat.service
```

3. Once the file opens, copy and paste the content below, changing the **JAVA_HOME** value to the information you found in the previous step.

```
[Unit]
Description=Apache Tomcat Web Application Container
After=network.target

[Service]
Type=forking

Environment=JAVA_HOME=/usr/lib/jvm/java-1.11.0-openjdk-amd64
Environment=CATALINA_PID=/opt/tomcat/latest/temp/tomcat.pid
Environment=CATALINA_HOME=/opt/tomcat
Environment=CATALINA_BASE=/opt/tomcat
```



```
ExecStart=/opt/tomcat/bin/startup.sh
```

```
ExecStop=/opt/tomcat/bin/shutdown.sh
```

```
User=tomcat
```

```
Group=tomcat
```

```
UMask=0007
```

```
RestartSec=10
```

```
Restart=always
```

```
[Install]
```

```
WantedBy=multi-user.target
```



```
File Edit View Search Terminal Help
GNU nano 2.9.3 /etc/systemd/system/tomcat.service

[Unit]
Description=Apache Tomcat Web Application Container
After=network.target

[Service]
Type=forking

Environment=JAVA_HOME=/usr/lib/jvm/java-1.11.0-openjdk-amd64
Environment=CATALINA_PID=/opt/tomcat/latest/temp/tomcat.pid
Environment=CATALINA_HOME=/opt/tomcat
Environment=CATALINA_BASE=/opt/tomcat
Environment='CATALINA_OPTS=-Xms512M -Xmx1024M -server -XX:+UserParallelGC'
Environment='JAVA_OPTS=-Djava.awt.headless=true -Djava.security.egd=file:/dev/.$$'

ExecStart=/opt/tomcat/bin/startup.sh
ExecStop=/opt/tomcat/bin/shutdown.sh

User=tomcat
Group=tomcat
UMask=0007
RestartSec=10
Restart=always

[Install]
WantedBy=multi-user.target

^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify
^X Exit      ^R Read File  ^\ Replace  ^U Uncut Text ^T To Spell
```

```
sudo systemctl daemon-reload
```

6. Now, you can finally start the Tomcat service:

```
sudo systemctl start tomcat
```

7. Verify the Apache Tomcat service is running with the command:

```
sudo systemctl status tomcat
```

The message you want to receive is that the service is **active (running)**.

Adjust Firewall



Tomcat uses Port 8080, which is outside your local network.

1. Open Port 8080 to allow traffic through it with the command:

```
sudo ufw allow 8080/tcp
```

2. If the port is open, you should be able to see the Apache Tomcat splash page. Type the following in the browser window:

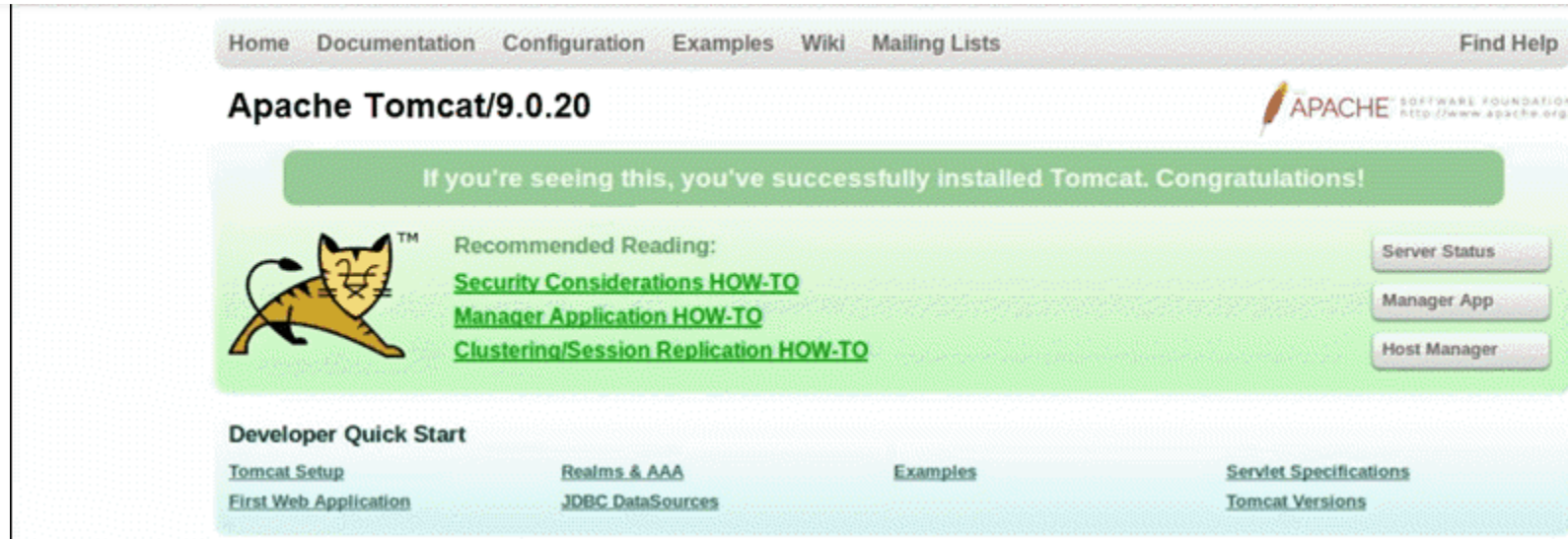
http://server_ip:8080

or

http://localhost:8080

Your web browser should open the web page as in the image below:





Configure Web Management Interface

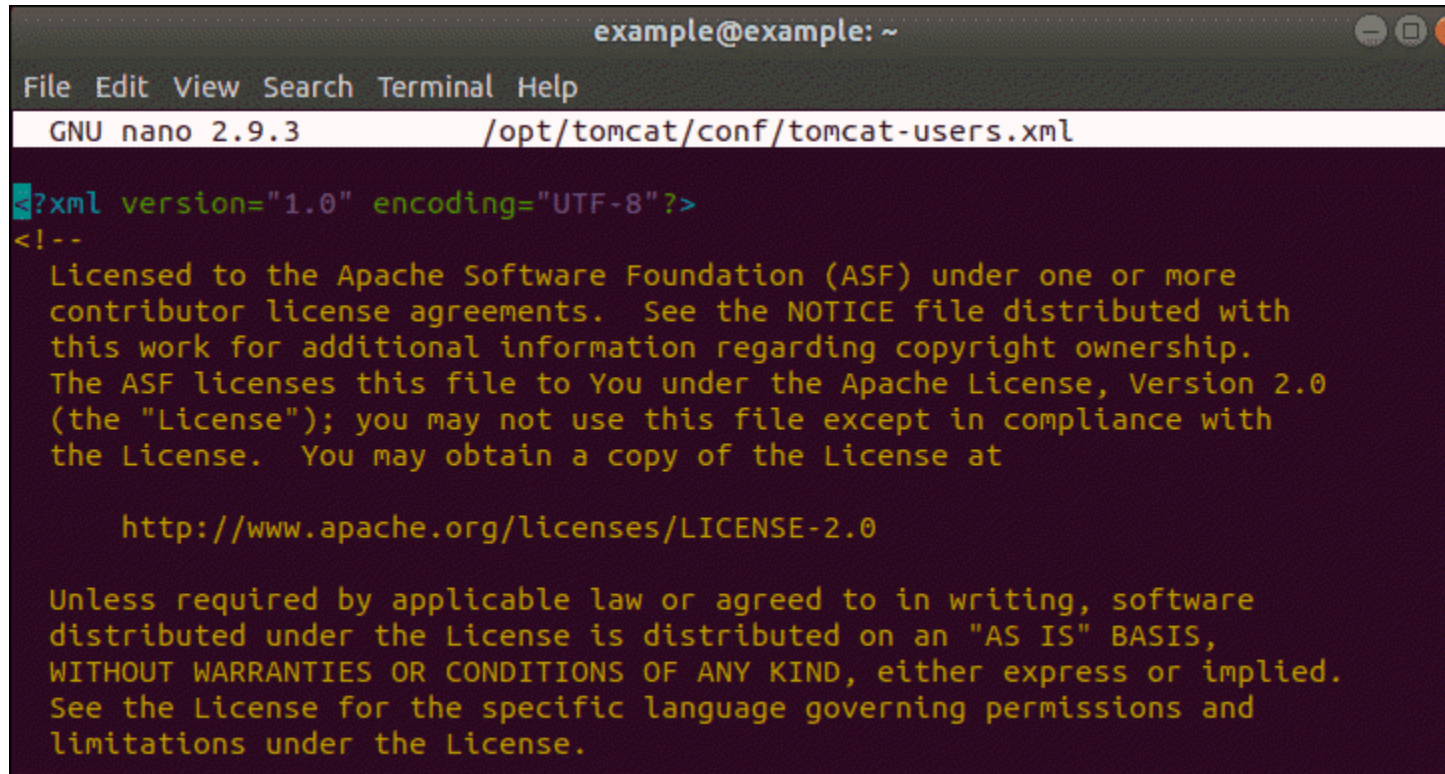
Once you verified the service is running properly, you need to [create a user who can use the web management interface](#).

To do this, open and edit the users file.



```
sudo nano /opt/tomcat/latest/conf/tomcat-users.xml
```

The file should appear like the one in the image below:



```
example@example: ~
File Edit View Search Terminal Help
GNU nano 2.9.3 /opt/tomcat/conf/tomcat-users.xml

<?xml version="1.0" encoding="UTF-8"?>
<!--
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contributor license agreements.  See the NOTICE file distributed with
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See the License for the specific language governing permissions and
limitations under the License.
-->
```

```
<tomcat-users>
<! --
Comments
-- >
<role rolename="admin-gui"/>
<role rolename="manager-gui"/>
<user username="admin" password="Your_Password" roles="admin-gui, manager-gui"/>
</tomcat-users>
```

Make sure to replace the **Your_Password** value with a strong password of your preference.

3. **Save** and **Exit** the file.

Configure Remote Access



```
sudo nano /opt/tomcat/latest/webapps/manager/META-INF/context.xml
```

2. Next, decide whether to grant access from a) **anywhere** or b) **from a specific IP address**.

1) To make it publicly accessible, add the following lines to the file:

```
<Context antiResourceLocking="false" privileged="true">
<!--

<Valve className="org.apache.catalina.valves.RemoteAddrValve"
allow="127\.\d+\.\d+\.\d+|::1|0000:1" />

-->

</Context>
```



```
<Context antiResourceLocking="false" privileged="true">
<!--

<Valve className="org.apache.catalina.valves.RemoteAddrValve"
allow="127\.\d+\.\d+\.\d+|::1|0000:1|THE.IP.ADDRESS." />

-- >

</Context>
```

3. Repeat the same process for the **host-manager** file.

Start by opening the file with the command:

```
sudo nano /opt/tomcat/latest/webapps/host-manager/META-INF/context.xml
```

Conclusion

With the help of this guide, you have installed and setup Tomcat on Ubuntu 18.04! You now have a working Tomcat installation on your Apache server and can start deploying your Java web applications.

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Author


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Sofija Simic is an aspiring Technical Writer at phoenixNAP. Alongside her educational background in teaching and writing, she has had a lifelong passion for information technology. She is committed to unscrambling confusing IT concepts and streamlining intricate software installations.







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