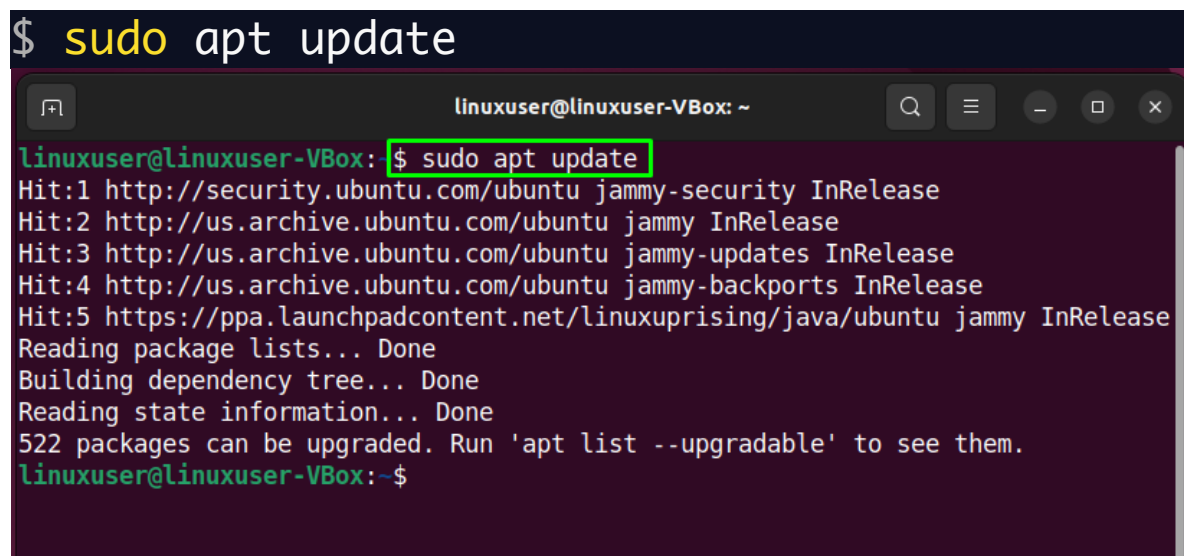


How to Install Apache Tomcat Server on Ubuntu 22.04

To install **Apache Tomcat Server** on **Ubuntu 22.04**, you must follow the below-given step-by-step instructions.

Step 1: Update system repositories

```
$ sudo apt update
```



```
linuxuser@linuxuser-VBox: $ sudo apt update
Hit:1 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:2 http://us.archive.ubuntu.com/ubuntu jammy InRelease
Hit:3 http://us.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:4 http://us.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:5 https://ppa.launchpadcontent.net/linuxuprising/java/ubuntu jammy InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
522 packages can be upgraded. Run 'apt list --upgradable' to see them.
linuxuser@linuxuser-VBox:~$
```

Step 2: Installation of Java

Before jumping into the installation of Apache Tomcat Server, it is essential to have “**Java**” on your system. For this purpose, execute the following command to install “**OpenJDK 11**”:

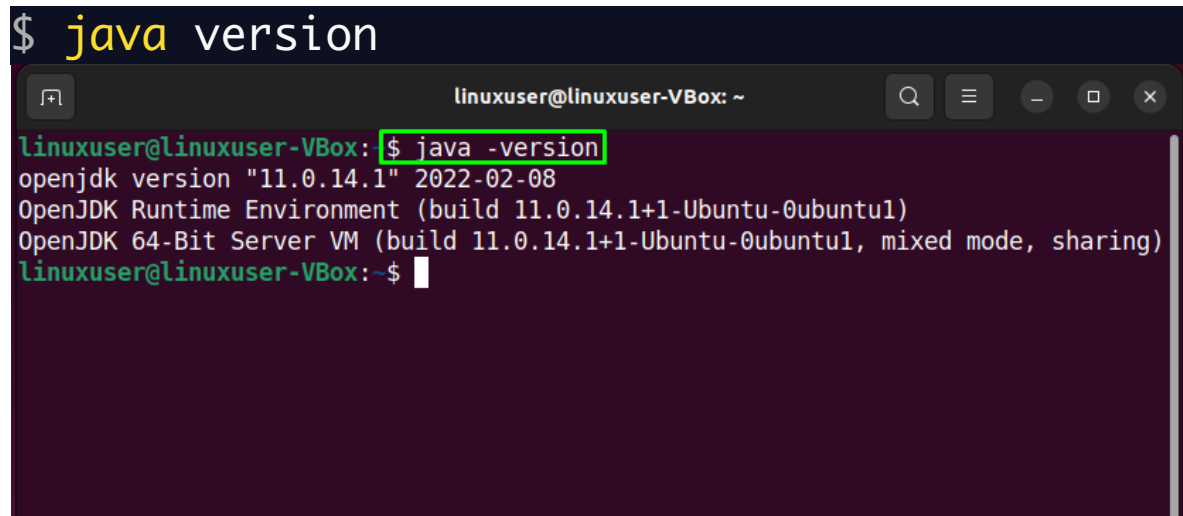
```
$ sudo apt install openjdk-11-jdk
```

```
linuxuser@linuxuser-VBox: ~  
linuxuser@linuxuser-VBox: $ sudo apt install openjdk-11-jdk  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following additional packages will be installed:  
  ca-certificates-java fonts-dejavu-extra java-common  
  libatk-wrapper-java libatk-wrapper-java-jni libice-dev  
  libpthread-stubs0-dev libsm-dev libsm6 libx11-dev libxau-dev  
  libxau6 libxcb1 libxcb1-dev libxdmcp-dev libxdmcp6 libxt-dev  
  openjdk-11-jdk-headless openjdk-11-jre openjdk-11-jre-headless  
  x11proto-dev xorg-sgml-doctools xtrans-dev  
Suggested packages:  
  default-jre libice-doc libsm-doc libx11-doc libxcb-doc libxt-doc  
  openjdk-11-demo openjdk-11-source visualvm fonts-ipafont-gothic  
  fonts-ipafont-mincho fonts-wqy-microhei | fonts-wqy-zenhei  
The following NEW packages will be installed:  
  ca-certificates-java fonts-dejavu-extra java-common  
  libatk-wrapper-java libatk-wrapper-java-jni libice-dev  
  libpthread-stubs0-dev libsm-dev libx11-dev libxau-dev libxcb1-dev  
  libxdmcp-dev libxt-dev openjdk-11-jdk openjdk-11-jdk-headless  
  openjdk-11-jre openjdk-11-jre-headless x11proto-dev  
  xorg-sgml-doctools xtrans-dev  
The following packages will be upgraded:  
  libsm6 libxau6 libxcb1 libxdmcp6
```

```
linuxuser@linuxuser-VBox: ~  
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...  
Processing triggers for hicolor-icon-theme (0.17-2) ...  
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...  
Processing triggers for libc-bin (2.35-0ubuntu3) ...  
Processing triggers for man-db (2.10.1-1) ...  
Processing triggers for ca-certificates (20211016) ...  
Updating certificates in /etc/ssl/certs...  
0 added, 0 removed; done.  
Running hooks in /etc/ca-certificates/update.d...  
  
done.  
done.  
Processing triggers for sgml-base (1.30) ...  
Setting up x11proto-dev (2021.5-1) ...  
Setting up libxau-dev:amd64 (1:1.0.9-1build5) ...  
Setting up libice-dev:amd64 (2:1.0.10-1build2) ...  
Setting up libsm-dev:amd64 (2:1.2.3-1build2) ...  
Setting up libxdmcp-dev:amd64 (1:1.1.3-0ubuntu5) ...  
Setting up libxcb1-dev:amd64 (1.14-3ubuntu3) ...  
Setting up libx11-dev:amd64 (2:1.7.5-1) ...  
Setting up libxt-dev:amd64 (1:1.2.1-1) ...  
linuxuser@linuxuser-VBox: ~$
```

Then, verify the version of the installed Java:

```
$ java version
```

A terminal window titled 'linuxuser@linuxuser-VBox: ~' with standard window controls. The command '\$ java -version' is entered and highlighted with a green box. The output shows the OpenJDK version '11.0.14.1' from 2022-02-08, including details about the runtime environment and VM build.

```
linuxuser@linuxuser-VBox: $ java -version
openjdk version "11.0.14.1" 2022-02-08
OpenJDK Runtime Environment (build 11.0.14.1+1-Ubuntu-0ubuntu1)
OpenJDK 64-Bit Server VM (build 11.0.14.1+1-Ubuntu-0ubuntu1, mixed mode, sharing)
linuxuser@linuxuser-VBox: ~$
```

Step 3: Check the availability of Apache Tomcat package

After fulfilling the requirements, **check** the **availability** of the **Apache Tomcat package** in the repository:

```
$ sudo apt-cache search tomcat
```

The given output signifies that the “**tomcat9**” package for download:

```
linuxuser@linuxuser-VBox: ~  
linuxuser@linuxuser-VBox: $ sudo apt-cache search tomcat  
[sudo] password for linuxuser:  
centreon-plugins - Collection of Nagios plugins to monitor OS, services and network devices  
libapache-mod-jk-doc - Documentation of libapache2-mod-jk package  
libapache2-mod-jk - Apache 2 connector for the Tomcat Java servlet engine  
libjnlpservlet-java - simple and convenient packaging format for JNLP applications  
liblogback-java - flexible logging library for Java  
liblogback-java-doc - flexible logging library for Java - documentation  
libnetty-tcnative-java - Tomcat native fork for Netty  
libnetty-tcnative-jni - Tomcat native fork for Netty (JNI library)  
libspring-instrument-java - modular Java/J2EE application framework - Instrumentation  
libtcnative-1 - Tomcat native library using the Apache Portable Runtime  
libtomcat9-embed-java - Apache Tomcat 9 - Servlet and JSP engine -- embed libraries  
libtomcat9-java - Apache Tomcat 9 - Servlet and JSP engine -- core libraries  
libtomcatjss-java - JSSE implementation using JSS for Tomcat  
monitoring-plugins-contrib - Plugins for nagios compatible monitoring systems  
python3-ajpy - Python module to craft AJP requests  
resource-agents-extra - Cluster Resource Agents  
tomcat-jakartaee-migration - Apache Tomcat migration tool for Jakarta EE  
tomcat9 - Apache Tomcat 9 - Servlet and JSP engine
```

Step 4: Install Apache Tomcat Server on Ubuntu 22.04

After finding the required **Apache Tomcat** package, we will install it on **Ubuntu 22.04** with the help of the below-given command:

```
$ sudo apt install tomcat9 tomcat9-admin
```

```
linuxuser@linuxuser-VBox: ~  
linuxuser@linuxuser-VBox: $ sudo apt install tomcat9 tomcat9-admin  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following additional packages will be installed:  
  libeclipse-jdt-core-java libtcnative-1 libtomcat9-java  
  tomcat9-common  
Suggested packages:  
  tomcat9-docs tomcat9-examples tomcat9-user  
The following NEW packages will be installed:  
  libeclipse-jdt-core-java libtcnative-1 libtomcat9-java tomcat9  
  tomcat9-admin tomcat9-common  
0 upgraded, 6 newly installed, 0 to remove and 518 not upgraded.  
Need to get 12.5 MB of archives.  
After this operation, 16.2 MB of additional disk space will be used.  
Do you want to continue? [Y/n] y ← Enter "y"
```

Press “y” to permit the installation for a few minutes:

```
linuxuser@linuxuser-VBox: ~  
Creating config file /etc/tomcat9/tomcat-users.xml with new version  
Creating config file /etc/tomcat9/web.xml with new version  
Creating config file /etc/tomcat9/server.xml with new version  
Creating config file /etc/tomcat9/logging.properties with new version  
Creating config file /etc/tomcat9/context.xml with new version  
Creating config file /etc/tomcat9/catalina.properties with new version  
Creating config file /etc/tomcat9/jaspic-providers.xml with new version  
Creating config file /etc/logrotate.d/tomcat9 with new version  
Creating config file /etc/default/tomcat9 with new version  
Created symlink /etc/systemd/system/multi-user.target.wants/tomcat9.service → /li  
b/systemd/system/tomcat9.service.  
Processing triggers for rsyslog (8.2112.0-2ubuntu2) ...  
Processing triggers for libc-bin (2.35-0ubuntu3) ...  
linuxuser@linuxuser-VBox:~$
```

Step 5: Check ports for Apache Tomcat Server

On Ubuntu 22.04, the Apache Tomcat Server **automatically** starts **working** after completing the **installation**. To validate this operation, you can utilize the “**ss**” command for displaying the network socket related information:

```
$ ss -ltn
```

The default port for the Apache Tomcat server is “**8080**” and it can be seen in the following output that port “**8080**” is listening for all incoming connections:

```
linuxuser@linuxuser-VBox: ~  
$ ss -ltn  
State Recv-Q Send-Q Local Address:Port Peer Address:Port Process  
LISTEN 0 4096 127.0.0.53:lo:53 0.0.0.0:*  
LISTEN 0 128 127.0.0.1:631 0.0.0.0:*  
LISTEN 0 70 127.0.0.1:33060 0.0.0.0:*  
LISTEN 0 151 127.0.0.1:3306 0.0.0.0:*  
LISTEN 0 128 [::]:631 [::]:*  
LISTEN 0 100 *:8080 *:8080  
LISTEN 0 511 *:80 *:80  
linuxuser@linuxuser-VBox:~$
```

Step 6: Open ports for Apache Tomcat Server

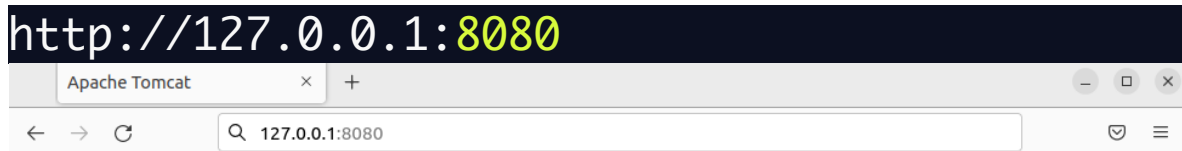
In case if the UFW firewall is activated on your system, then it may cause trouble while connecting external devices. So, to permit the incoming from any type of source to port “8080”, write out the following “ufw” command:

```
sudo ufw allow from any to any  
port 8080 proto tcp
```

```
linuxuser@linuxuser-VBox: ~  
$ sudo ufw allow from any to any port 8080 proto tcp  
Rules updated  
Rules updated (v6)  
linuxuser@linuxuser-VBox:~$
```

Step 7: Test working of Apache Tomcat Server

If you have carefully followed all of the previous given, then at this point, the Apache Tomcat Server should be running on Ubuntu 22.04. To test its working specify your system loopback address with the number of the opened port for **Apache Tomcat Server**:



It works !

If you're seeing this page via a web browser, it means you've setup Tomcat successfully. Congratulations!

This is the default Tomcat home page. It can be found on the local filesystem at: `/var/lib/tomcat9/webapps/ROOT/index.html`

Tomcat veterans might be pleased to learn that this system instance of Tomcat is installed with `CATALINA_HOME` in `/usr/share/tomcat9` and `CATALINA_BASE` in `/var/lib/tomcat9`, following the rules from `/usr/share/doc/tomcat9-common/RUNNING.txt.gz`.

You might consider installing the following packages, if you haven't already done so:

tomcat9-docs: This package installs a web application that allows to browse the Tomcat 9 documentation locally. Once installed, you can access it by clicking [here](#).

tomcat9-examples: This package installs a web application that allows to access the Tomcat 9 Servlet and JSP examples. Once installed, you can access it by clicking [here](#).

tomcat9-admin: This package installs two web applications that can help managing this Tomcat instance. Once installed, you can access the [manager webapp](#) and the [host-manager webapp](#).

NOTE: For security reasons, using the manager webapp is restricted to users with role "manager-gui". The host-manager webapp is restricted to users with role "admin-gui". Users are defined in `/etc/tomcat9/tomcat-users.xml`.

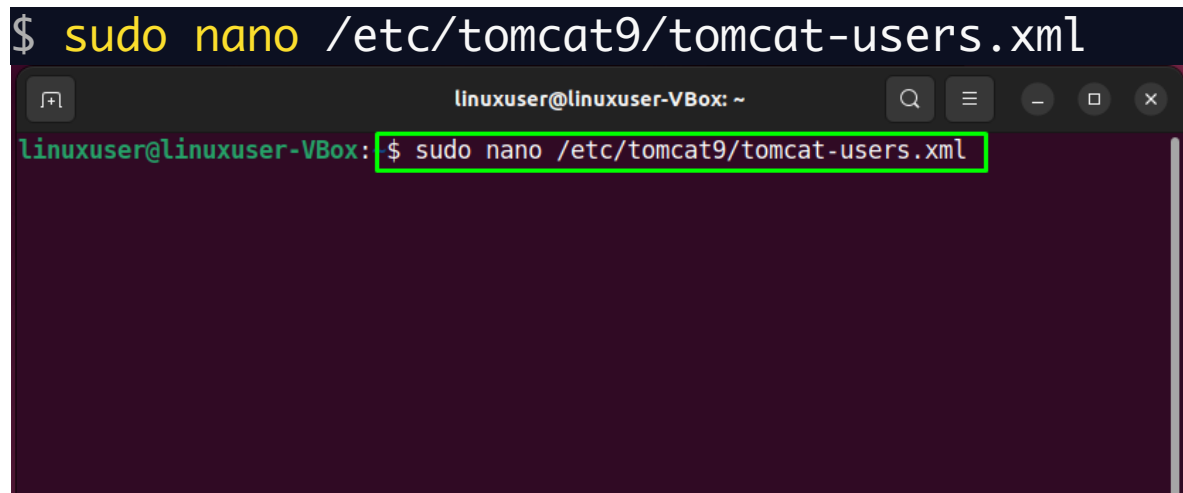
How to use Apache Tomcat Web Application Manager on Ubuntu 22.04

Before using Apache Tomcat Web application manager, it is required to set up a new Tomcat user.

Step 1: Creating Tomcat user

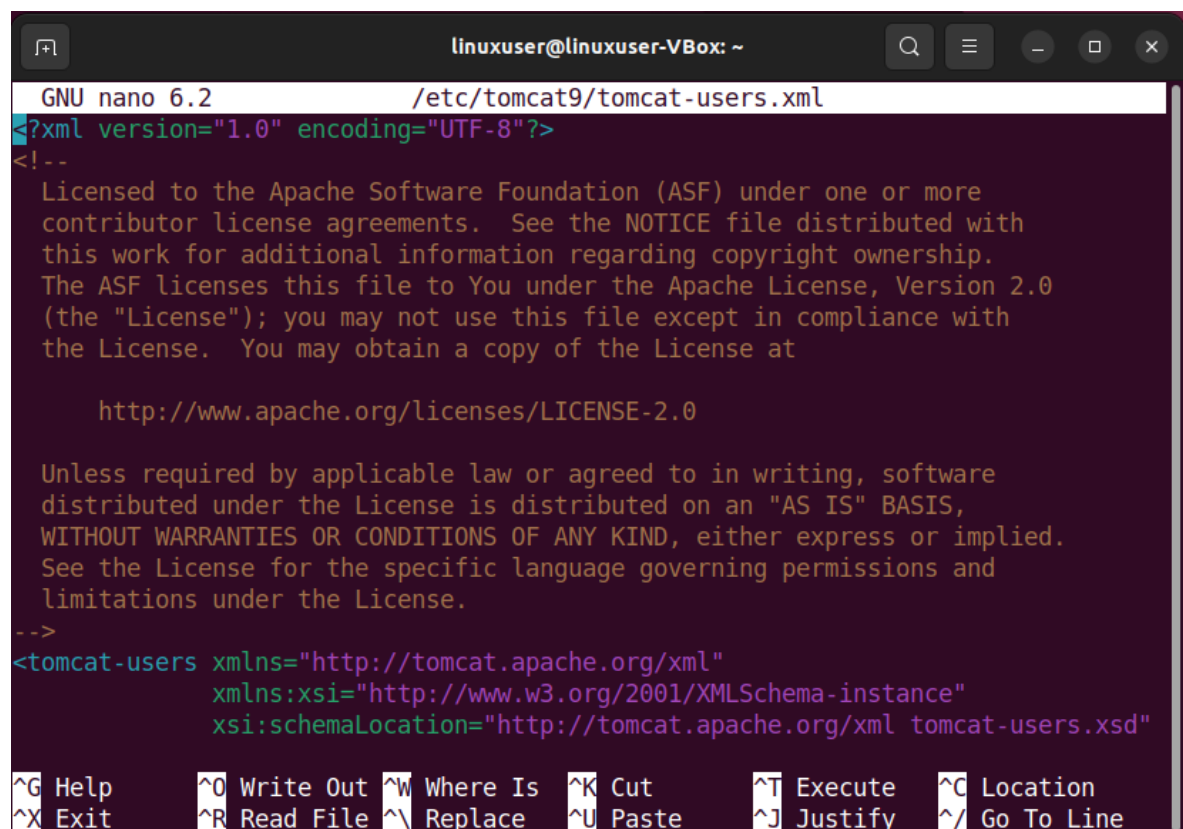
Firstly, open up the “**tomcat-users.xml**” file in the “**nano**” editor:


```
$ sudo nano /etc/tomcat9/tomcat-users.xml
```



A terminal window titled 'linuxuser@linuxuser-VBox: ~' showing the command `$ sudo nano /etc/tomcat9/tomcat-users.xml` entered at the prompt. The command is highlighted with a green box.

Your “**tomcat-users.xml**” file will somehow look like this:



A terminal window titled 'linuxuser@linuxuser-VBox: ~' showing the contents of the file `/etc/tomcat9/tomcat-users.xml` opened in nano 6.2. The file content is as follows:

```
GNU nano 6.2 /etc/tomcat9/tomcat-users.xml
<?xml version="1.0" encoding="UTF-8"?>
<!--
Licensed to the Apache Software Foundation (ASF) under one or more
contributor license agreements.  See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0
(the "License"); you may not use this file except in compliance with
the License.  You may obtain a copy of the License at

    http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
-->
<tomcat-users xmlns="http://tomcat.apache.org/xml"
              xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
              xsi:schemaLocation="http://tomcat.apache.org/xml tomcat-users.xsd"
```

At the bottom of the terminal, there is a table of nano editor shortcuts:

^G Help	^O Write Out	^W Where Is	^K Cut	^T Execute	^C Location
^X Exit	^R Read File	^\\ Replace	^U Paste	^J Justify	^_ Go To Line

Now, paste the following lines in the opened “**tomcat-**

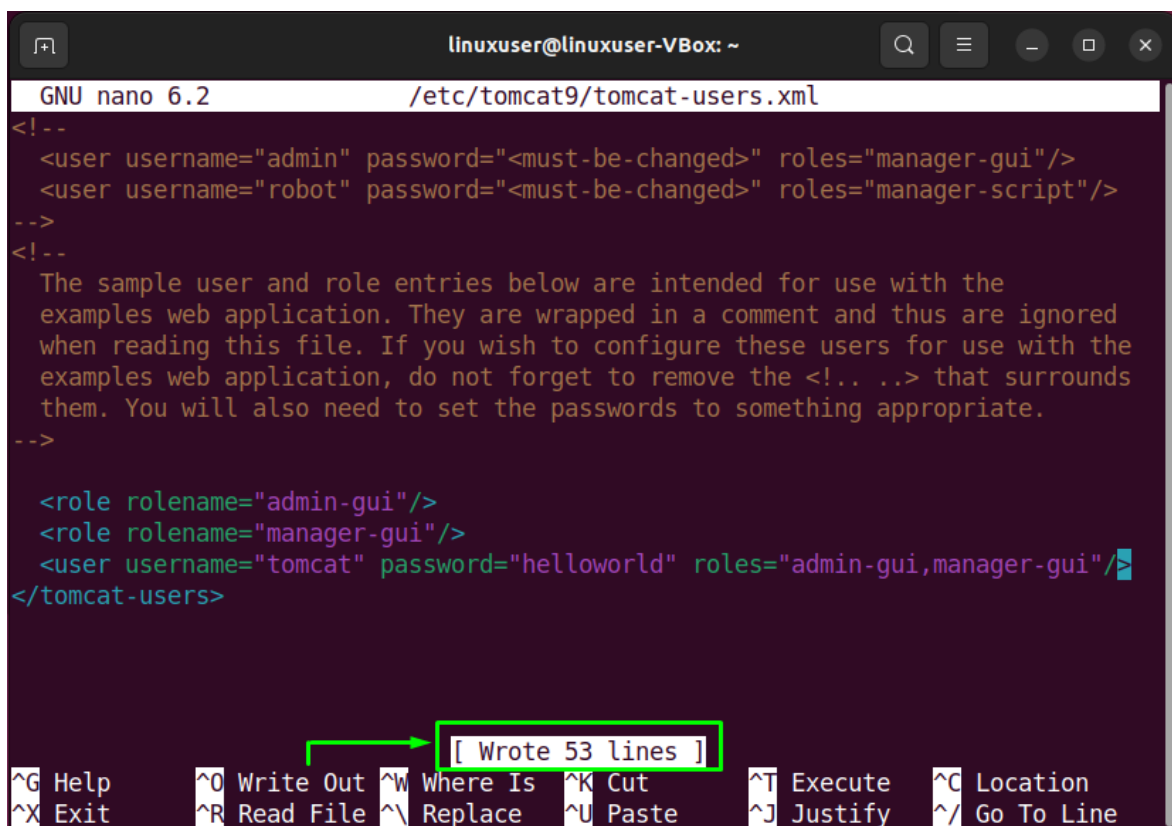
users.xml” file to create a new user named **“tomcat”** with the password **“helloworld”** having **“admin-gui”** and **“manager-gui”** roles:

```
<role rolename="admin-gui"/>
```

```
<role rolename="manager-gui"/>
```

```
<user username="tomcat" password="pass" roles="admin-gui,manager-gui"/>
```

Press **“Ctrl+O”** to save the added changes:



```
linuxuser@linuxuser-VBox: ~
GNU nano 6.2 /etc/tomcat9/tomcat-users.xml
<!--
<user username="admin" password="<must-be-changed>" roles="manager-gui"/>
<user username="robot" password="<must-be-changed>" roles="manager-script"/>
-->
<!--
The sample user and role entries below are intended for use with the
examples web application. They are wrapped in a comment and thus are ignored
when reading this file. If you wish to configure these users for use with the
examples web application, do not forget to remove the <!-- --> that surrounds
them. You will also need to set the passwords to something appropriate.
-->

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

[Wrote 53 lines]

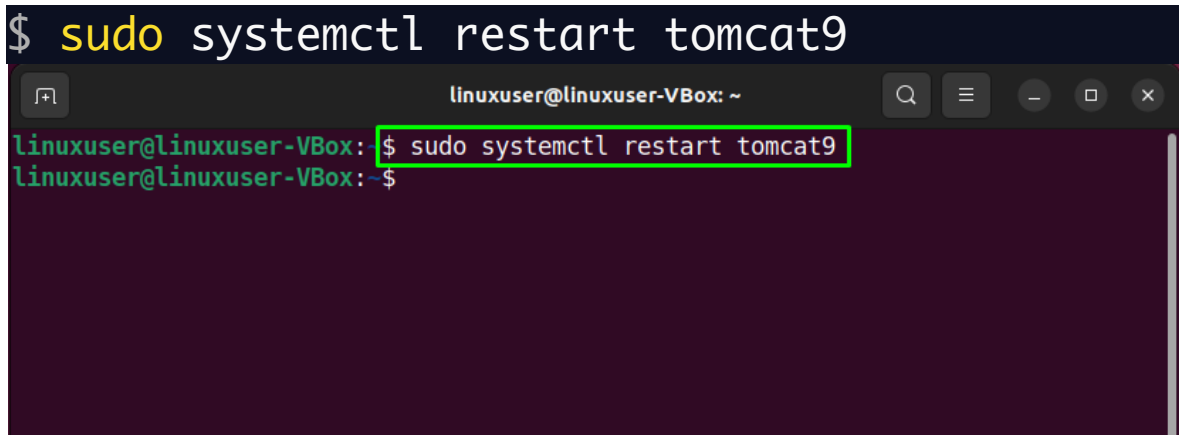
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^_ Go To Line

Step 2: Restart Tomcat Server

After creating a Tomcat account, restart the Apache

Tomcat Server:

```
$ sudo systemctl restart tomcat9
```

A terminal window titled 'linuxuser@linuxuser-VBox: ~' with standard window controls. The prompt is 'linuxuser@linuxuser-VBox: ~\$'. The command 'sudo systemctl restart tomcat9' is entered and highlighted with a green box. The prompt changes to 'linuxuser@linuxuser-VBox: ~\$' after the command is executed.

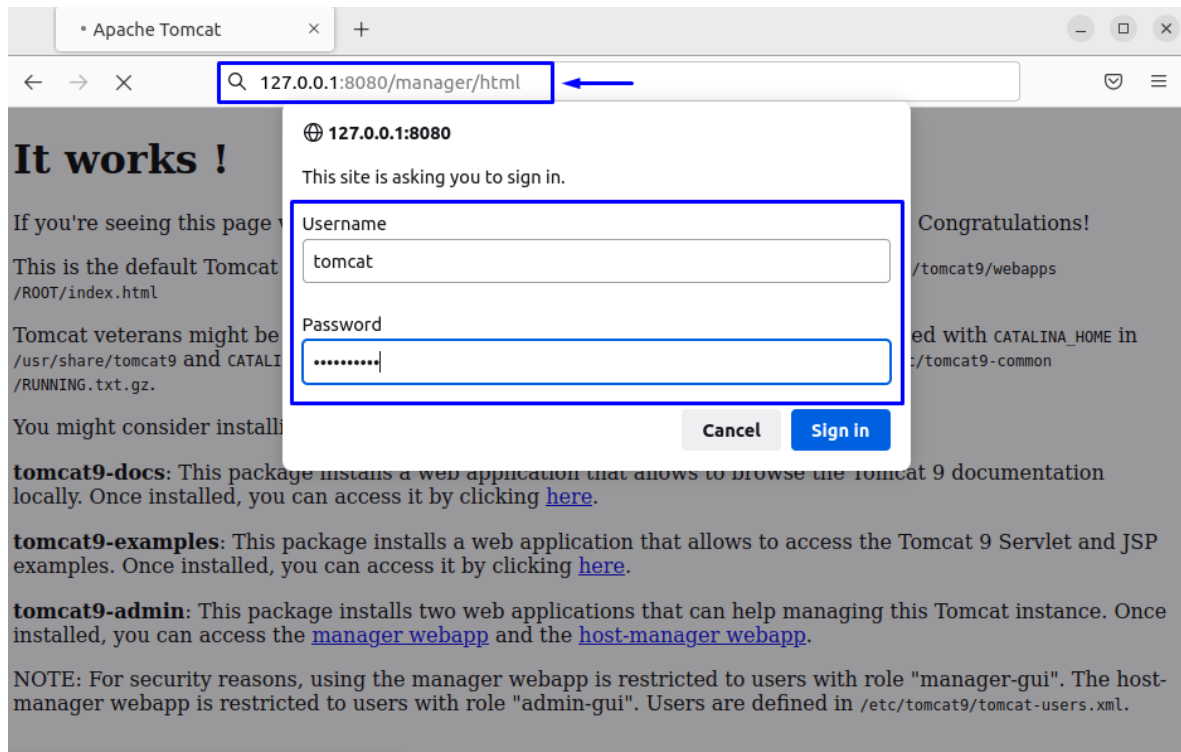
```
linuxuser@linuxuser-VBox: ~$ sudo systemctl restart tomcat9  
linuxuser@linuxuser-VBox: ~$
```

Step 3: Open Tomcat Web Application Manager

Lastly, navigate to the following link for accessing the Tomcat Web Application Manager. You will be asked to input the credentials for accessing the created user account:

```
http://127.0.0.1:8080/manager/html
```



Enter the “**username**” and “**password**” which you have specified in the “**tomcat-users.xml**” file and click “**Sign in**”:



Congratulations! Now you can now access the Tomcat Web Application Manager via the tomcat user account:

/manager

127.0.0.1:8080/manager/html

Tomcat Web Application Manager

Message: OK

Manager
[List Applications](#)
[HTML Manager Help](#)
[Manager Help](#)
[Server Status](#)

Applications					
Path	Version	Display Name	Running	Sessions	Commands
/	None specified		true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/host-manager	None specified	Tomcat Host Manager Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/manager	None specified	Tomcat Manager Application	true	1	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

We have compiled the method to install Apache Tomcat Server and use its application manager on Ubuntu 22.04.