How To Install Tomcat 9 on Amazon Linux 2

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In this blog post we'll take you through a step-by-step installation of Apache Tomcat 9 on Amazon Linux 2. Apache Tomcat is a free to use JAVA HTTP web server developed by the Apache Software Foundation. Tomcat is an implementation of the Java Servlet, JavaServer Pages, Java Expression Language and WebSocket technologies.

In a nutshell Apache Tomcat runs a HTTP web server environment in which special Java programs known as "J*ava Servlet*" and "*Java Server Pages (JSP)*" can be executed. Due to its open-source nature Tomcat has been widely adopted by Enterprise customers. It Powers Payment platforms, E-Commerce platforms, Cloud environments among many other use cases.

Install Apache Tomcat 9 on Amazon Linux 2

The type of installation of Tomcat that we'll do is manual. Which means we'll start from source download, extract and copying files to relevant directories to performing user creation and permissions.

Below steps have been organized for easy following to help new users install Apache Tomcat 9 on Amazon Linux 2. Just follow the steps and change the values as instructed where required to have a working Tomcat 9 installation on Amazon Linux 2 instance.

The installation can be done in an on-prem virtualization environment or instance running in AWS EC2 environment.

Step 1: Install Java on Amazon Linux 2

Ensure Java is installed and working perfectly in the server.

Update and reboot the server:

```
sudo yum -y update sudo reboot
```

Install Java 11 from Amazon Linux Extras repository:

```
sudo amazon-linux-extras install java-openjdk11
```

Hit **y** key to begin installation:

```
Total download size: 46 M Installed size: 183 M Is this ok [y/d/N]: y
```

Confirm installation:

```
$ java -version openjdk version "11.0.7" 2020-04-14 LTS OpenJDK Runtime Environment 18.9 (build 11.0.7+10-LTS) OpenJDK 64-Bit Server VM 18.9 (build 11.0.7+10-LTS, mixed mode, sharing)
```

Step 2: Create tomcat user and group

We'll be creating a dedicated system *tomcat* user and group.

```
sudo groupadd --system tomcat sudo useradd -d /usr/share/tomcat -r -s /bin/false -g tomcat tomcat
```

Confirm creation:

```
$ getent passwd tomcat tomcat:x:996:994::/usr/share/tomcat:/bin/false
$ getent group tomcat tomcat:x:994:
```

Step 3: Install Tomcat 9 on Amazon Linux 2

Latest releases of Apache Tomcat software can be checked from the Software releases page.

Run the following commands to download the latest version of Apache Tomcat 9 as of this article update.

```
sudo yum -y install wget export VER="9.0.39" wget https://archive.apache.org/dist/tomcat/tomcat-9/v${VER}/bin/apache-tomcat-${VER}.tar.gz
```

Use *tar* command line tool to extract downloaded archive.

```
sudo tar xvf apache-tomcat-${VER}.tar.gz -C /usr/share/
```

Create Symlink to the folder */usr/share/tomcat*. This is for easy updates.

```
sudo ln -s /usr/share/apache-tomcat-$VER/ /usr/share/tomcat
```

Update folder permissions:

```
sudo chown -R tomcat:tomcat /usr/share/tomcat sudo chown -R tomcat:tomcat /usr/share/apache-tomcat-$VER/
```

The `/usr/share/tomcat` directory has the following sub-directories:

- **bin**: contains the *binaries* and *scripts* (e.g `startup.sh` and `shutdown.sh` for Unixes and Mac OS X).
- **conf**: contains the system-wide *configuration* files, such as `server.xml`, `web.xml`, and `context.xml`.
- **webapps**: contains the *webapps* to be deployed. You can also place the WAR (Webapp Archive) file for deployment here.
- **lib**: contains the Tomcat's system-wide library JAR files, accessible by all webapps. You could also place external JAR file (such as MySQL JDBC Driver) here.
- **logs**: contains Tomcat's log files. You may need to check for error messages here.
- **work**: Tomcat's working directory used by JSP, for JSP-to-Servlet conversion.

Create Tomcat Systemd service:

```
sudo tee /etc/systemd/system/tomcat.service<<EOF [Unit]
Description=Tomcat Server After=syslog.target network.target
[Service] Type=forking User=tomcat Group=tomcat
Environment=JAVA_HOME=/usr/lib/jvm/jre
Environment='JAVA_OPTS=-Djava.awt.headless=true'
Environment=CATALINA_HOME=/usr/share/tomcat
Environment=CATALINA_BASE=/usr/share/tomcat
Environment=CATALINA_PID=/usr/share/tomcat/temp/tomcat.pid
Environment='CATALINA_OPTS=-Xms512M -Xmx1024M'
ExecStart=/usr/share/tomcat/bin/catalina.sh start
ExecStop=/usr/share/tomcat/bin/catalina.sh stop [Install]
WantedBy=multi-user.target EOF
```

You can update `CATALINA_OPTS` values with your memory limits for Tomcat service.

Enable and start tomcat service:

```
sudo systemctl daemon-reload sudo systemctl start tomcat sudo systemctl enable tomcat
```

Service should be in the *running* state:

```
$ systemctl status tomcat ● tomcat.service - Tomcat Server Loaded: loaded (/etc/systemd/system/tomcat.service; enabled; vendor preset: disabled) Active: active (running) since Sat 2020-10-10 11:18:40 UTC; 49s ago Main PID: 30574 (java) CGroup: /system.slice/tomcat.service └─30574 /usr/lib/jvm/jre/bin/java -Djava.util.logging.config.file=/usr/share/tomcat/conf/logging.properties -Djava.util.logging.manager=org.apache.j... Oct 10 11:18:40 ip-172-31-39-10.eu-west-1.compute.internal systemd[1]: Starting Tomcat Server... Oct 10 11:18:40 ip-172-31-39-10.eu-west-1.compute.internal systemd[1]: Started Tomcat Server.
```

Allow Tomcat TCP port *8080* if you have firewalld service enabled.

```
sudo firewall-cmd --permanent --add-port=8080/tcp sudo firewall-cmd --reload
```

Step 4: Configure Tomcat Authentication

We have to edit Tomcat configuration file to enable Admin and Manager UI roles.

```
sudo vim /usr/share/tomcat/conf/tomcat-users.xml
```

Add below lines before closing with `</tomcat-users>`

```
<role rolename="admin-gui"/> <role rolename="manager-gui"/> <user
username="admin" password="TomcatAdminP@ssw0rd"
fullName="Administrator" roles="admin-gui,manager-gui"/>
```

Where:

- **admin** is access username
- **TomcatAdminP@ssw0rd** is the password for admin user.

Configure Apache web server as a proxy for Tomcat server. First install *httpd* package.

```
sudo yum -y install httpd
```

Create VirtualHost file for Tomcat Admin web interface:

```
$ sudo vim /etc/httpd/conf.d/tomcat_manager.conf <VirtualHost *:80>
ServerAdmin root@localhost ServerName tomcat.hirebestengineers.com
DefaultType text/html ProxyRequests off ProxyPreserveHost On
ProxyPass / http://localhost:8080/ ProxyPassReverse /
http://localhost:8080/ </VirtualHost>
```

Where:

- **hirebestengineers.com** is the DNS name of your tomcat server.

For AJP connector, it will be configuration like this:

```
<VirtualHost *:80> ServerName ajp.example.com ProxyRequests Off
ProxyPass / ajp://localhost:8009/ ProxyPassReverse /
ajp://localhost:8009/ </VirtualHost>
```

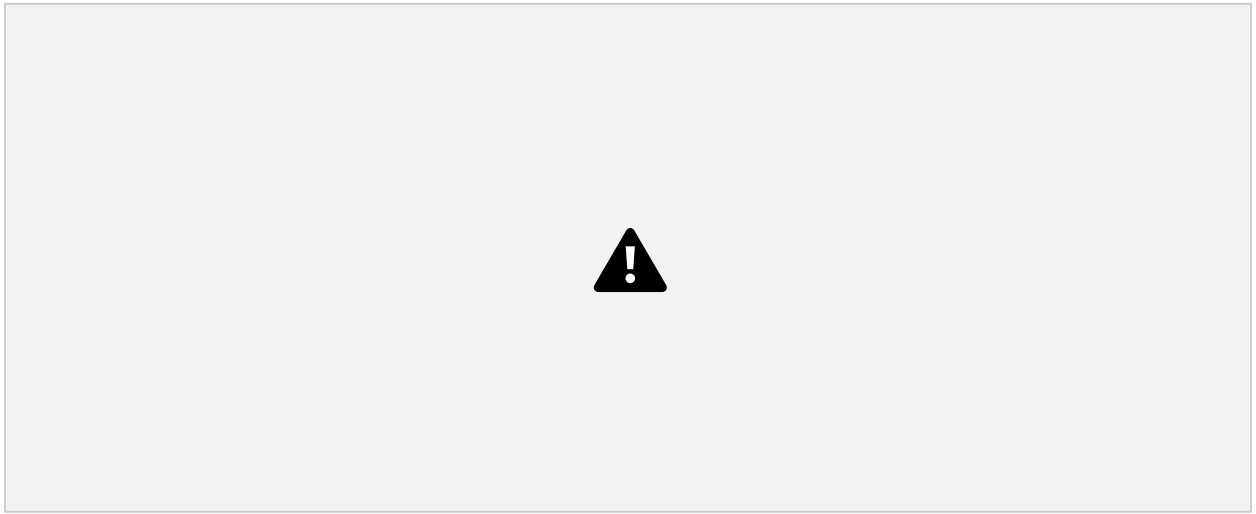
If SELinux is enabled run the following commands:

```
sudo setsebool -P httpd_can_network_connect 1 sudo setsebool -P
httpd_can_network_relay 1 sudo setsebool -P httpd_graceful_shutdown 1
sudo setsebool -P nis_enabled 1
```

Restart httpd service:

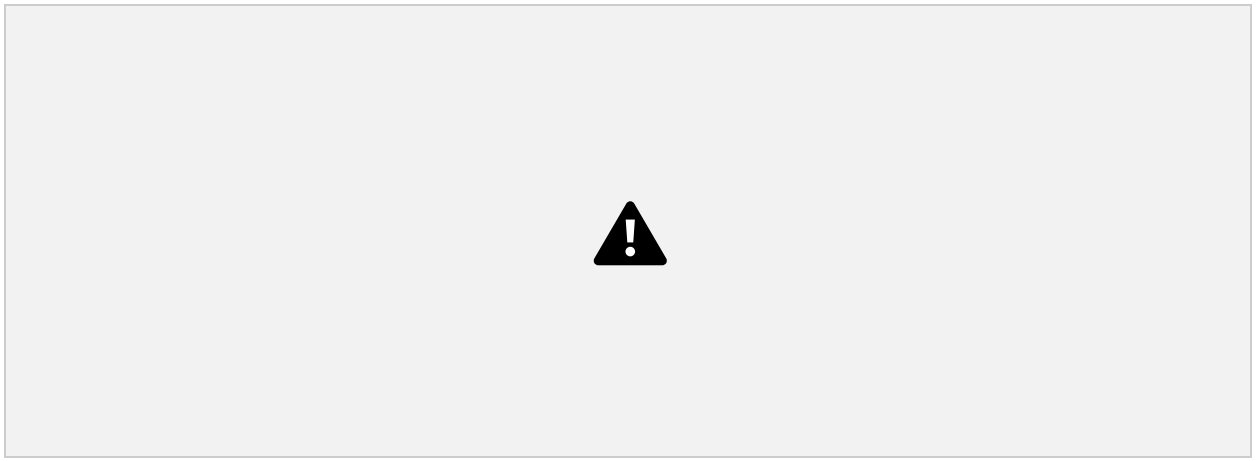
```
sudo systemctl restart httpd sudo systemctl enable httpd
```

If access is required from a network external to AWS, you may need to allow port *80* on Security group.

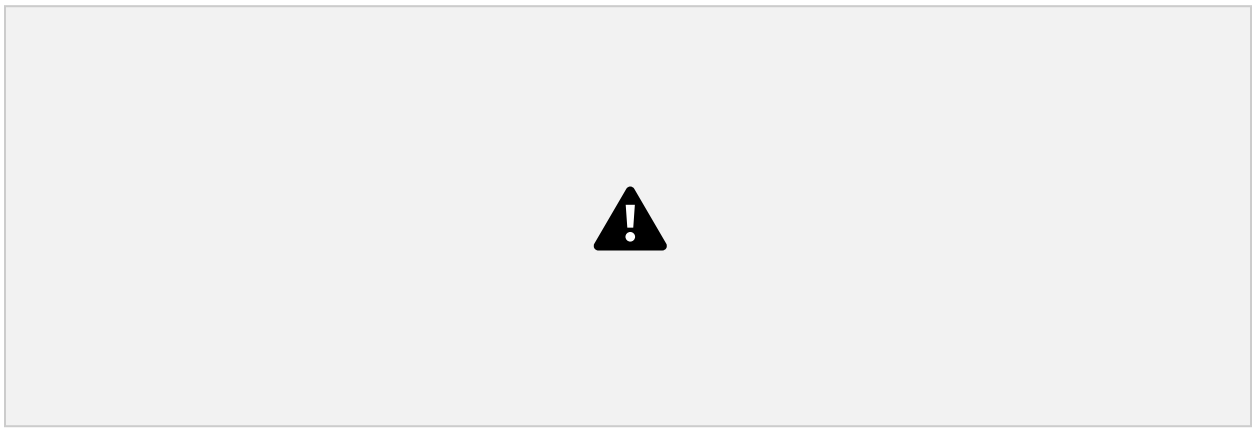


Step 5: Access Tomcat Web interface

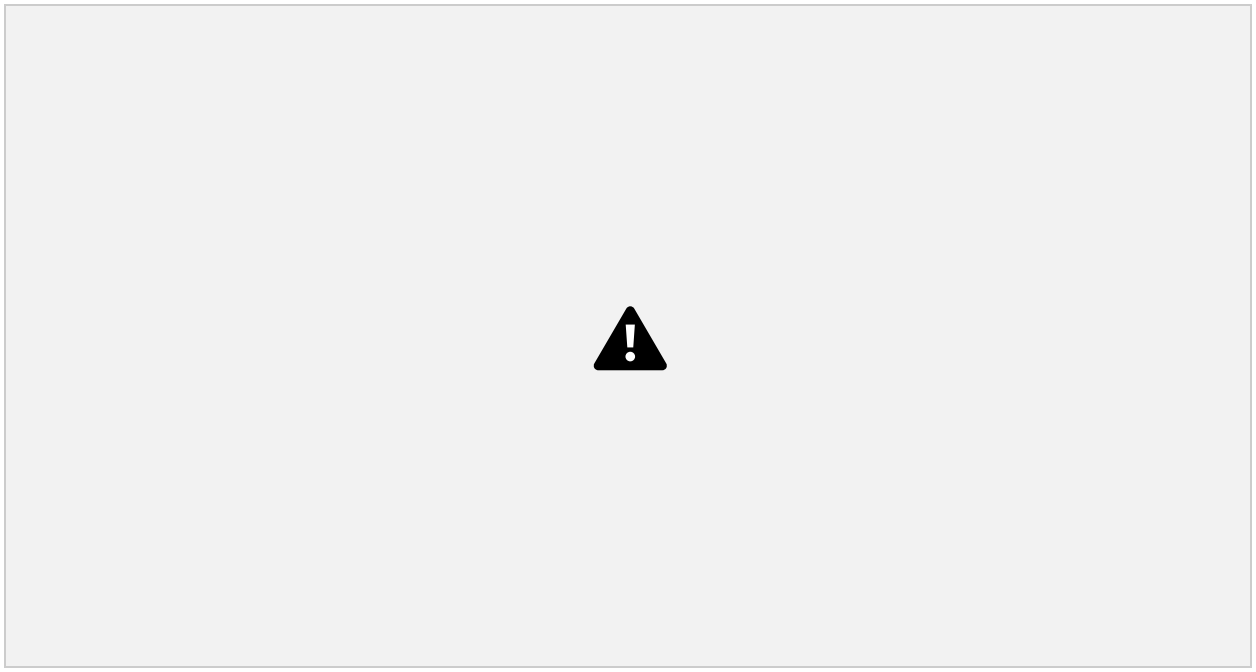
Open your web browser and type the DNS name configured in Apache for Apache Tomcat.



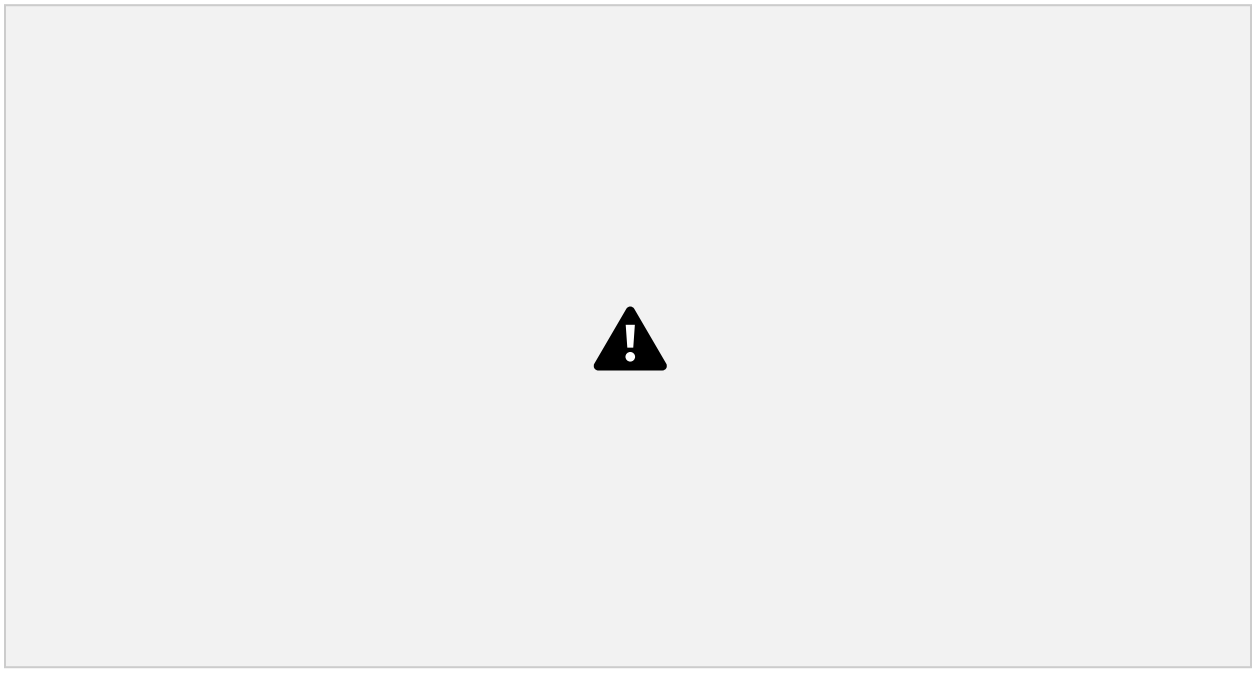
You need to authenticate to view server status and manage Tomcat Applications.



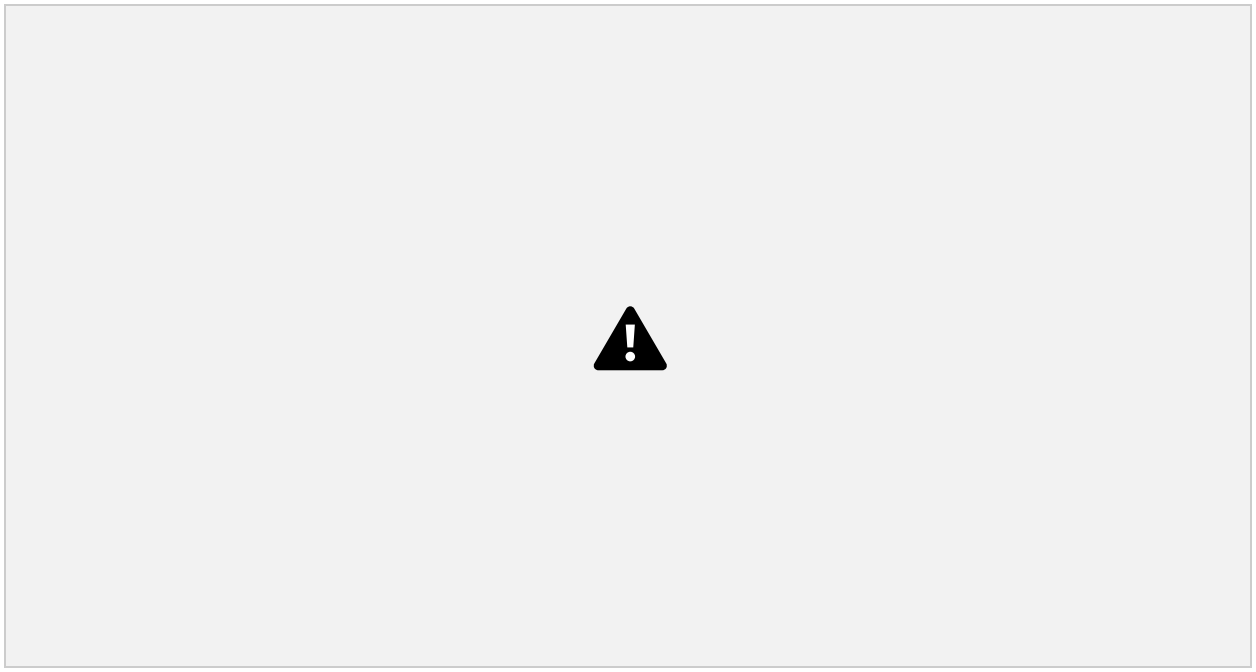
You’ll then be able to check server status.



Deploy and manage Web applications.



Tomcat Virtual Host Management.



This is the end of our guide on installation of Tomcat 9 on Amazon Linux 2 server. The next article will capture securing Tomcat Server with an SSL Certificate.