

# How to Install Tomcat 9 on CentOS 8

Apache Tomcat is an open-source implementation of the Java Servlet, JavaServer Pages, Java Expression Language, and Java WebSocket technologies. It is one of the most widely adopted applications and web servers in the world today. Tomcat is simple to use and has a robust ecosystem of add-ons.

## Installation Tutorial

This tutorial explains how to install Tomcat 9.0 on CentOS 8.

### Installing Java

Tomcat 9 requires Java SE 8 or later. We will install OpenJDK 11, the open-source implementation of the Java Platform.

Run the following command as root or user with sudo privileges to install Java:

```
# dnf install java-11-openjdk-devel
```

Once the installation is complete, verify it by checking the Java version:

```
# java -version
```

The output should look something like this:

```
openjdk version "11.0.5" 2019-10-15 LTS
OpenJDK Runtime Environment 18.9 (build 11.0.5+10-LTS)
OpenJDK 64-Bit Server VM 18.9 (build 11.0.5+10-LTS, mixed mode, sharing)
```

### Creating a System User

Running Tomcat under the root user is a security risk. We'll create a new system user and group with home directory /opt/tomcat that will run the Tomcat service. To do so, enter the following command:

```
# useradd -m -U -d /opt/tomcat -s /bin/false tomcat
```

### Downloading Tomcat

Tomcat binary distribution is available for download from the Tomcat downloads page.

At the time of writing, the latest Tomcat version is 9.0.30. Before continuing with the next step, check the Tomcat 9 download page to see if a newer version is available.

Download the Tomcat zip file with wget to the /tmp directory:

```
# VERSION=9.0.30
# wget
https://www-eu.apache.org/dist/tomcat/tomcat-9/v${VERSION}/bin/apache-tomcat-
-${VERSION}.tar.gz -P /tmp
```

Once the download is complete, extract the tar file to the /opt/tomcat directory:

```
# tar -xf /tmp/apache-tomcat-${VERSION}.tar.gz -C /opt/tomcat/
```

Tomcat is updated on a regular basis. To have more control over versions and updates, we'll create a symbolic link called latest, that points to the Tomcat installation directory:

```
# ln -s /opt/tomcat/apache-tomcat-${VERSION} /opt/tomcat/latest
```

The system user that was previously created, must have access to the tomcat installation directory. Change the directory ownership to user and group tomcat:

```
# chown -R tomcat: /opt/tomcat
```

Make the shell scripts inside the bin directory executable:

```
# sh -c 'chmod +x /opt/tomcat/latest/bin/*.sh'
```

These scripts are later used to start and stop Tomcat from the systemd unit file.

## Creating a Systemd Unit File

Instead of manually starting and stopping the Tomcat server, we'll set it to run as a service. Open your text editor and create a tomcat.service unit file in the /etc/systemd/system/ directory:

```
# vim /etc/systemd/system/tomcat.service
```

Paste the following content:

```
[Unit]
Description=Tomcat 9 servlet container
After=network.target

[Service]
Type=forking

User=tomcat
Group=tomcat
```

```
Environment="JAVA_HOME=/usr/lib/jvm/jre"
Environment="JAVA_OPTS=-Djava.security.egd=file:///dev/urandom"

Environment="CATALINA_BASE=/opt/tomcat/latest"
Environment="CATALINA_HOME=/opt/tomcat/latest"
Environment="CATALINA_PID=/opt/tomcat/latest/temp/tomcat.pid"
Environment="CATALINA_OPTS=-Xms512M -Xmx1024M -server -XX:+UseParallelGC"

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

[Install]
WantedBy=multi-user.target
```

Save and close the file.

Notify systemd that a new service file exists, by typing:

```
# systemctl daemon-reload
```

Enable and start the Tomcat service:

```
# systemctl enable --now tomcat
```

Check the service status; the output should show that the Tomcat server is enabled and running:

```
# systemctl status tomcat
```

```
● tomcat.service - Tomcat 9 servlet container
   Loaded: loaded (/etc/systemd/system/tomcat.service; enabled; vendor
  preset: disabled)
   Active: active (running) since Wed 2020-01-15 20:38:07 UTC; 30s ago
     Process: 3957 ExecStart=/opt/tomcat/latest/bin/startup.sh (code=exited,
  status=0/SUCCESS)
   ...
```

## Configuring Firewall

If your server is protected by a firewall and you want to access the tomcat interface from the outside of the local network, you need to open port 8080.

Use the following commands to open the necessary port:

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

Typically, when running Tomcat in a production environment, you should use a load balancer or

reverse proxy. It's a best practice to allow access to port 8080 only to your internal network.

## Additional: Configuring Tomcat Web Management Interface

At this point, you should be able to access Tomcat with a web browser on port 8080. The web management interface is not accessible because we have not created a user yet.

Tomcat users and roles are defined in the `tomcat-users.xml` file.

If you open the file, you will notice that it is filled with comments and examples describing how to configure the file.

```
# vim /opt/tomcat/latest/conf/tomcat-users.xml
```

Tomcat users are defined the user in the `tomcat-users.xml` file. To create a new user that can access the tomcat web interface (manager-gui and admin-gui), edit file as shown below. Make sure you change the username and password to something more secure:

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

By default Tomcat web management interface is configured to allow access only from the localhost.

If you need to access the web interface from anywhere open the following files and comment or remove the lines highlighted in yellow:

```
# vim /opt/tomcat/latest/webapps/manager/META-INF/context.xml
```

```
<Context antiResourceLocking="false" privileged="true" >
<!--
  <Valve className="org.apache.catalina.valves.RemoteAddrValve"
    allow="127\.\d+\.\d+\.\d+|::1|0:0:0:0:0:0:0:1" />
-->
</Context>
```

```
# vim /opt/tomcat/latest/webapps/host-manager/META-INF/context.xml
```

```
<sxh xml>
<Context antiResourceLocking="false" privileged="true" >
<!--
  <Valve className="org.apache.catalina.valves.RemoteAddrValve"
    allow="127\.\d+\.\d+\.\d+|::1|0:0:0:0:0:0:0:1" />
-->
</Context>
</sxh>
```

Please note, allowing access from anywhere is not recommended because it is a security risk.

If you want to access the web interface only from a specific IP, instead of commenting the blocks add your public IP to the list.

Let's say your public IP is ''41.41.41.41'' and you want to allow access only from that IP:

```
<code># vim /opt/tomcat/latest/webapps/manager/META-INF/context.xml
```

```
<Context antiResourceLocking="false" privileged="true" >
  <Valve className="org.apache.catalina.valves.RemoteAddrValve"
    allow="127\.\d+\.\d+\.\d+|::1|0:0:0:0:0:0:0:1|41.41.41.41" />
</Context>
```

```
# vim /opt/tomcat/latest/webapps/host-manager/META-INF/context.xml
```

```
<Context antiResourceLocking="false" privileged="true" >
  <Valve className="org.apache.catalina.valves.RemoteAddrValve"
    allow="127\.\d+\.\d+\.\d+|::1|0:0:0:0:0:0:0:1|41.41.41.41" />
</Context>
```

The list of allowed IP addresses is a list separated with vertical bar |. You can add single IP addresses or use a regular expressions.

Once done, restart the Tomcat service for changes to take effect:

```
# systemctl restart tomcat
```

---

## Testing Management Interface Installation

Open your browser and type: [http://<your\\_domain\\_or\\_IP\\_address>:8080](http://<your_domain_or_IP_address>:8080)

Upon successful installation, a screen similar to the following should appear:

# Apache Tomcat/9.0.13



If you're seeing this, you've successfully installed Tomcat. Congratulations!



### Recommended Reading:

- [Security Considerations HOW-TO](#)
- [Manager Application HOW-TO](#)
- [Clustering/Session Replication HOW-TO](#)

Server Status

Manager App

Host Manager

## Developer Quick Start

[Tomcat Setup](#)

[First Web Application](#)

[Realms & AAA](#)

[JDBC DataSources](#)

[Examples](#)

[Servlet Specifications](#)

[Tomcat Versions](#)

## Managing Tomcat

For security, access to the [manager webapp](#) is restricted. Users are defined in:

```
$CATALINA_HOME/conf/tomcat-users.xml
```

In Tomcat 9.0 access to the manager application is split between different users. [Read more...](#)

### Release Notes

### Changelog

### Migration Guide

### Security Notices

## Documentation

### Tomcat 9.0 Documentation

### Tomcat 9.0 Configuration

### Tomcat Wiki

Find additional important configuration information in:

```
$CATALINA_HOME/RUNNING.txt
```

Developers may be interested in:

[Tomcat 9.0 Bug Database](#)

[Tomcat 9.0 JavaDocs](#)

[Tomcat 9.0 SVN Repository](#)

## Getting Help

### FAQ and Mailing Lists

The following mailing lists are available:

#### tomcat-announce

Important announcements, releases, security vulnerability notifications. (Low volume).

#### tomcat-users

User support and discussion

#### taglibs-user

User support and discussion for [Apache Taglibs](#)

#### tomcat-dev

Development mailing list, including commit messages

## Other Downloads

[Tomcat Connectors](#)

[Tomcat Native](#)

[Taglibs](#)

[Deployer](#)

## Other Documentation

[Tomcat Connectors](#)

[mod\\_jk Documentation](#)

[Tomcat Native](#)

[Deployer](#)

## Get Involved

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[SVN Repositories](#)

[Mailing Lists](#)

[Wiki](#)

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[Thanks](#)

## Apache Software Foundation

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[Heritage](#)

[Apache Home](#)

[Resources](#)

Tomcat web application manager dashboard allows you to deploy, undeploy, start, stop, and reload your applications. It is available at:

[http://<your\\_domain\\_or\\_IP\\_address>:8080/manager/html](http://<your_domain_or_IP_address>: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	Welcome to Tomcat	true	0	Start <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle $\geq$ <input type="text" value="30"/> minutes
/docs	None specified	Tomcat Documentation	true	0	Start <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle $\geq$ <input type="text" value="30"/> minutes
/examples	None specified	Servlet and JSP Examples	true	0	Start <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle $\geq$ <input type="text" value="30"/> minutes
/host-manager	None specified	Tomcat Host Manager Application	true	0	Start <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle $\geq$ <input type="text" value="30"/> minutes
/manager	None specified	Tomcat Manager Application	true	2	Start <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle $\geq$ <input type="text" value="30"/> minutes

**Deploy**

**Deploy directory or WAR file located on server**

Context Path (required):

XML Configuration file URL:

WAR or Directory URL:

---

**WAR file to deploy**

Select WAR file to upload  No file chosen

Tomcat virtual host manager dashboard allows you to create, delete, and manage Tomcat virtual hosts. It is available at: [http://<your\\_domain\\_or\\_IP\\_address>:8080/host-manager/html](http://<your_domain_or_IP_address>:8080/host-manager/html).



## Tomcat Virtual Host Manager

Message: OK

**Host Manager**

<a href="#">List Virtual Hosts</a>	<a href="#">HTML Host Manager Help</a>	<a href="#">Host Manager Help</a>	<a href="#">Server Status</a>
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**Host name**

Host name	Host aliases	Commands
localhost		Host Manager installed - commands disabled

**Add Virtual Host**

**Host**

Name:

Aliases:

App base:

AutoDeploy

DeployOnStartup

DeployXML

UnpackWARs

Manager App

CopyXML

**Persist configuration**

Save current configuration (including virtual hosts) to server.xml and per web application context.xml files

Last update: **2020/01/23 13:32**