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How To Install Apache Tomcat 8 on Ubuntu 14.04

Jun 19, 2015 Java, Deployment Ubuntu

Introduction

Apache Tomcat is a web server and servlet container that is used to serve Java applications. Tomcat is an open source implementation of the Java Servlet and JavaServer Pages technologies, released by the Apache Software Foundation. This tutorial covers the basic installation and some configuration of the latest release of Tomcat 8 on your Ubuntu 14.04 server.

Prerequisites

Before you begin with this guide, you should have a separate, non-root user account set up on your server. You can learn how to do this by completing steps 1-3 in the initial server setup for Ubuntu 14.04. We will be using the `demo` user created here for the rest of this tutorial.

Install Java

Tomcat requires that Java is installed on the server, so any Java web application code can be executed. Let's satisfy that requirement by installing OpenJDK 7 with apt-get.

First, update your apt-get package index:

```
$ sudo apt-get update
```

Then install the Java Development Kit package with apt-get:

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

Answer `y` at the prompt to continue installing OpenJDK 7.

Now that Java is installed, let's create a `tomcat` user, which will be used to run the Tomcat service.

Create Tomcat User

For security purposes, Tomcat should be run as an unprivileged user (i.e. not root). We will create a new user and group that will run the Tomcat service.

First, create a new `tomcat` group:

```
$ sudo groupadd tomcat
```

Then create a new `tomcat` user. We'll make this user a member of the `tomcat` group, with a home directory of `/opt/tomcat` (where we will install Tomcat), and with a shell of `/bin/false` (so nobody can log into the account):

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

Now that our `tomcat` user is set up, let's download and install Tomcat.

Install Tomcat

The easiest way to install Tomcat 8 at this time is to download the latest binary release then configure it manually.

Download Tomcat Binary

Find the latest version of Tomcat 8 at the Tomcat 8 Downloads page. At the time of writing, the latest version is **8.0.23**. Under the **Binary Distributions** section, then under the **Core** list, copy the link to the "tar.gz".

Let's download the latest binary distribution to our home directory.

First, change to your home directory:

```
$ cd ~
```

Then use `wget` and paste in the link to download the Tomcat 8 archive, like this (your mirror link will probably differ from the example):

```
$ wget http://mirror.sdunix.com/apache/tomcat/tomcat-8/v8.0.23/bin/apache-tomcat-8.0.
```

We're going to install Tomcat to the `/opt/tomcat` directory. Create the directory, then extract the the archive to it with these commands:

```
$ sudo mkdir /opt/tomcat
$ sudo tar xvf apache-tomcat-8*tar.gz -C /opt/tomcat --strip-components=1
```

Now we're ready to set up the proper user permissions.

Update Permissions

The `tomcat` user that we set up needs to have the proper access to the Tomcat installation. We'll set that up now.

Change to the Tomcat installation path:

```
$ cd /opt/tomcat
```

Then give the `tomcat` user **write** access to the `conf` directory, and **read** access to the files in that directory:

```
$ sudo chgrp -R tomcat conf
$ sudo chmod g+rwx conf
$ sudo chmod g+r conf/*
```

Then make the `tomcat` user the owner of the `work`, `temp`, and `logs` directories:

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

Now that the proper permissions are set up, let's set up an Upstart init script.

Install Upstart Script

Because we want to be able to run Tomcat as a service, we will set up an Upstart script.

Tomcat needs to know where Java was installed. This path is commonly referred to as "JAVA_HOME". The easiest way to look up that location is by running this command:

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

```
Output:
There is only one alternative in link group java (providing /usr/bin/java): /usr/lib/
Nothing to configure.
```

The JAVA*HOME will be in the output, without the trailing* `/bin/java`*. For the example above, the JAVA*HOME is highlighted in red.

Now we're ready to create the Upstart script. Create and open it by running this command:

```
$ sudo nano /etc/init/tomcat.conf
```

Paste in the following script, and modify the value of `JAVA_HOME` if necessary. You may also want to modify the memory allocation settings that are specified in `CATALINA_OPTS`:

/etc/init/tomcat.conf

```
description "Tomcat Server"

  start on runlevel [2345]
  stop on runlevel [!2345]
  respawn
  respawn limit 10 5

  setuid tomcat
  setgid tomcat
```

```
env JAVA_HOME=/usr/lib/jvm/java-7-openjdk-amd64/jre
env CATALINA_HOME=/opt/tomcat

# Modify these options as needed
env JAVA_OPTS="-Djava.awt.headless=true -Djava.security.egd=file:/dev/./urandom"
env CATALINA_OPTS="-Xms512M -Xmx1024M -server -XX:+UseParallelGC"

exec $CATALINA_HOME/bin/catalina.sh run

# cleanup temp directory after stop
post-stop script
  rm -rf $CATALINA_HOME/temp/*
end script
```

Save and exit. This script tells the server to run the Tomcat service as the `tomcat` user, with the settings specified. It also enables Tomcat to run when the server is started.

Now let's reload the Upstart configuration, so we can use our new Tomcat script:

```
$ sudo initctl reload-configuration
```

Tomcat is ready to be run. Start it with this command:

```
$ sudo initctl start tomcat
```

Tomcat is not completely set up yet, but you can access the default splash page by going to your domain or IP address followed by `:8080` in a web browser:

```
Open in web browser:
http://server_IP_address:8080
```

You will see the default Tomcat splash page, in addition to other information. Now we will go deeper into the installation of Tomcat.

Configure Tomcat Web Management Interface

In order to use the manager webapp that comes with Tomcat, we must add a login to our Tomcat server. We will do this by editing the `tomcat-users.xml` file:

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

This file is filled with comments whic SCROLL TO TOP configure the file. You may want to delete all the comments between the following two lines, or you may leave them if you want to reference the examples:

tomcat-users.xml excerpt

```
<tomcat-users>
...
</tomcat-users>
```

You will want to add a user who can access the `manager-gui` and `admin-gui` (webapps that come with Tomcat). You can do so by defining a user similar to the example below. Be sure to change the username and password to something secure:

tomcat-users.xml — Admin User

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

Save and quit the tomcat-users.xml file. To put our changes into effect, restart the Tomcat service:

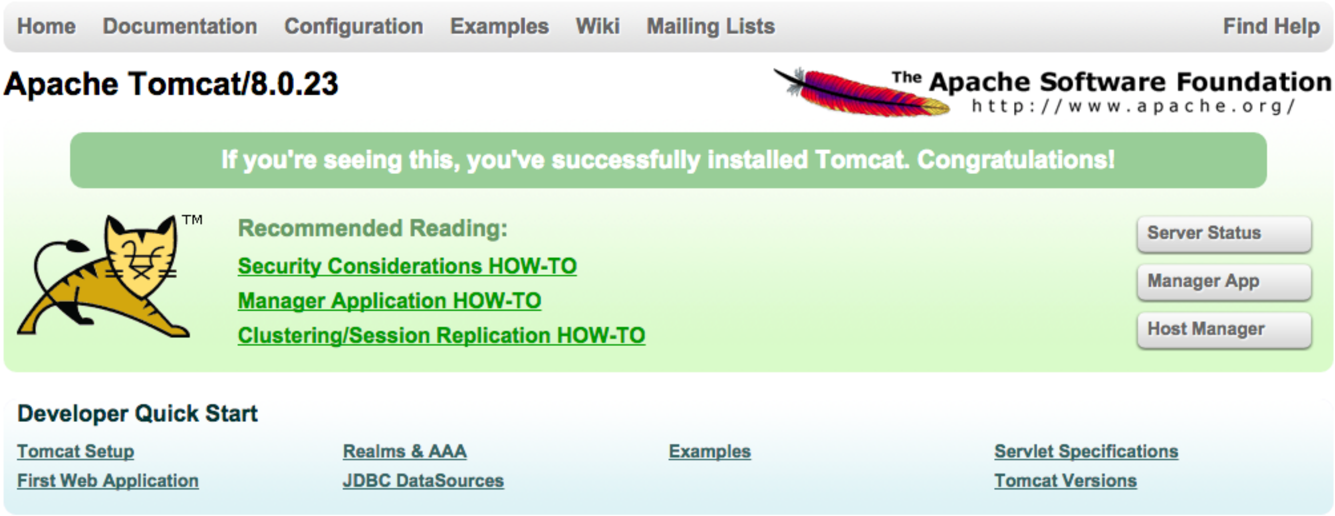
```
$ sudo initctl restart tomcat
```

Access the Web Interface

Now that Tomcat is up and running, let's access the web management interface in a web browser. You can do this by accessing the public IP address of the server, on port 8080:

```
Open in web browser:
http://server_IP_address:8080
```

You will see something like the following image:



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

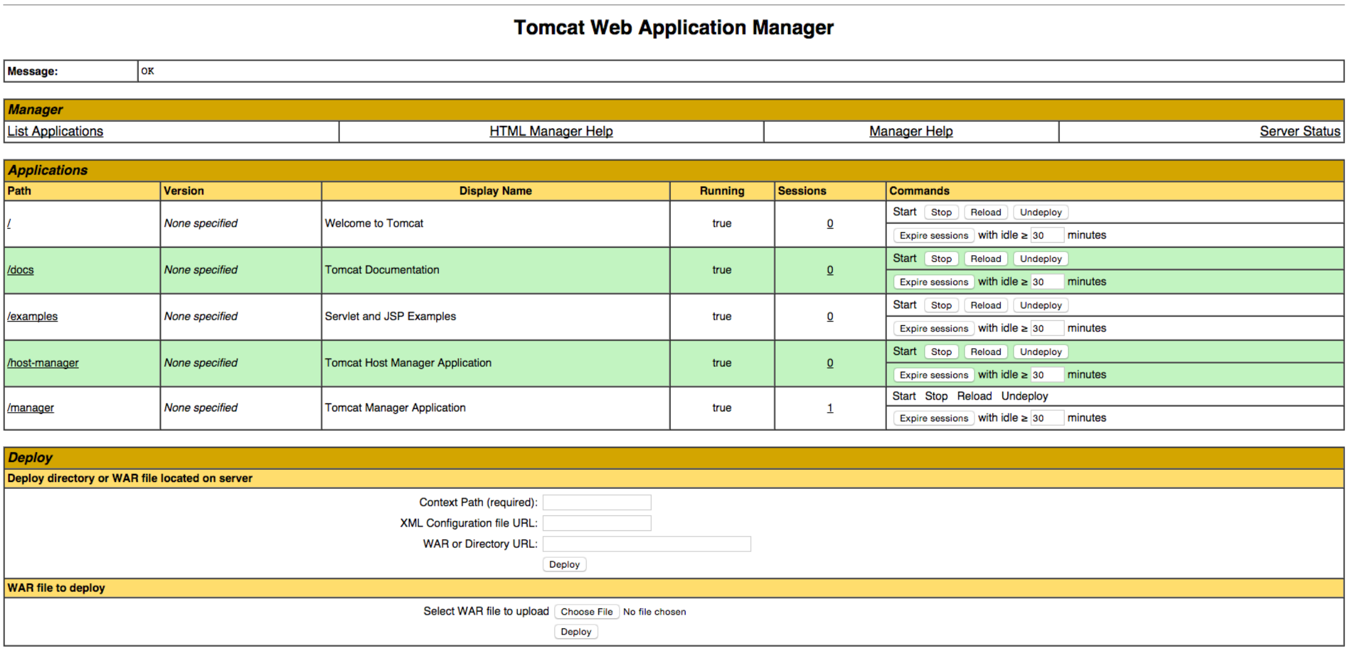
Recommended Reading:
Security Considerations HOW-TO
Manager Application HOW-TO
Clustering/Session Replication HOW-TO

Developer Quick Start

Tomcat Setup
First Web Application
Realms & AAA
JDBC DataSources
Examples
Servlet Specifications
Tomcat Versions

As you can see, there are links to the admin webapps that we configured an admin user for.

Let's take a look at the Manager App, accessible via the link or `http://server_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 Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/examples	None specified	Servlet and JSP Examples	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

Deploy

Deploy directory or WAR file located on server

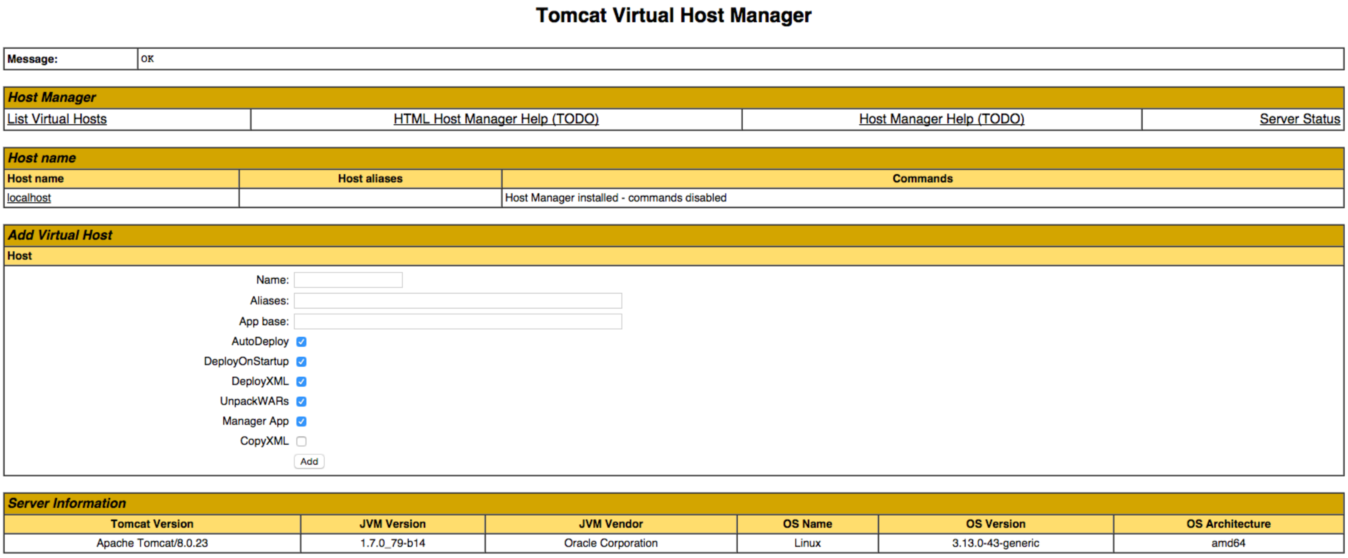
Context Path (required):
XML Configuration file URL:
WAR or Directory URL:
Deploy

WAR file to deploy

Select WAR file to upload Choose File No file chosen
Deploy

The Web Application Manager is used to manage your Java applications. You can Start, Stop, Reload, Deploy, and Undeploy here. You can also run some diagnostics on your apps (i.e. find memory leaks). Lastly, information about your server is available at the very bottom of this page.

Now let's take a look at the Host Manager, accessible via the link or `http://server_IP_address:8080/host-manager/html/`:



Tomcat Virtual Host Manager

Message:	OK

Host Manager			
List Virtual Hosts	HTML Host Manager Help (TODO)	Host Manager Help (TODO)	Server Status

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 ☐

Add

Server Information

Tomcat Version	JVM Version	JVM Vendor	OS Name	OS Version	OS Architecture
Apache Tomcat/8.0.23	1.7.0_79-b14	Oracle Corporation	Linux	3.13.0-43-generic	amd64

From the Virtual Host Manager page, you can add virtual hosts to serve your applications from.

Conclusion

Your installation of Tomcat is complete! Your are now free to deploy your own Java web applications!

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39 Comments

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dmonti *July 9, 2015*

There is a little issue on **tomcat.conf** file, it's needed to remove all initial spaces in each line to be able to run **initctl reload-configuration** successfully, that was the only problem here.
Thanks for the tutorial!

I also get this error deploying a new app: *Unable to create the directory [/opt/tomcat/webapps/ROOT]*
So, I guess that is needed to grant tomcat permissions to **webapps** folder, you can do this executing this command: *sudo chown -R tomcat /opt/tomcat/webapp*

♡ 4

ferchoman09 *March 30, 2016*

thanks, works for me!

♡

ventil *July 26, 2015*

I got

```
~$ sudo initctl reload-configuration
sudo: initctl: command not found
```

♡

charwood *July 28, 2015*

I had the same problem, it's an l not a 1.

♡

Skywish13 *September 27, 2015*

I had that problem too, it's because tomcat can't start using configuration from tomcat.conf. so my droplet has only 1GB memory and java in provided configuration ask for all that memory.

so reduce memory consumption:
env CATALINA_OPTS="-**Xms256M** **-Xmx512M **-server -XX:+UseParallelGC"

also check logs:
var/log/upstart/ if it any errors now

after, that i finally can run and open tomcat start page :)

♡

rr16566 *October 10, 2015*

try `init-checkconf /etc/init/tomcat.conf`

sophistry *January 11, 2016*

Same, I solved this by re-installing Ubuntu but this time choosing version 14.04. , had the latest version installed.

anandchakru *March 16, 2016*

..this might be due to initctl missing inside /sbin dir. Are you on Ubuntu 15.10?
in 15.10 ubuntu switched from Upstart to systemd ref

joakimsd *July 27, 2015*

Hi,
Very nice guide. But if I follow this, there will be no catalina.out created. Can that be fixed?

jeroen915972 *July 29, 2015*

tomcat.out is now in /var/log/upstart/tomcat.log. I'm still wondering where the base directory is (where is the application.log which is specified in logback.xml)

martinfeineis *August 1, 2015*

Very nice and helpful tutorial I had some issues with creating the user for tomcat https://www.mulesoft.com/tcat/tomcat-linux helped me here, also I use JAVA from Oracle, so http://stackoverflow.com/questions/17287542/setting-java-home-path-on-ubuntu helped me here, too. Thanks for writing this Tutorial :-)

Srikar *August 24, 2015*

Just in case, if anyone is looking for equivalent "Systemd" service script (e.g. to use on Ubuntu 15.04) , here is one I wrote:

Filename:

/etc/systemd/system/tomcat.service

Content:

[Unit]

Description=Tomcat 8 Server
[Service]
Type=forking
User=tomcat
Group=tomcat
EnvironmentFile=/etc/conf.d/tomcat
ExecStart=/opt/tomcat/bin/catalina.sh run
ExecStopPost=/bin/rm -rf /opt/tomcat/temp/*
Restart=on-failure
[Install]
WantedBy=multi-user.target

The environment file should be created and defined as follows:

Filename:

/etc/conf.d/tomcat

Content:

JAVA*HOME=/usr/lib/jvm/java-8-oracle*
*CATALINA*HOME=/opt/tomcat
JAVA*OPTS=-Djava.awt.headless=true -Djava.security.egd=file:/dev/./urandom*
*CATALINA*OPTS=-Xms512M -Xmx1024M -server -XX:+UseParallelGC

Relevant service enabling and start commands:

sudo systemctl enable tomcat

sudo systemctl start tomcat

joaquimfanton *October 10, 2015*

**FIX

```
JAVA_HOME=/usr/lib/jvm/java-8-oracle
CATALINA_HOME=/opt/tomcat
JAVA_OPTS=-Djava.awt.headless=true -Djava.security.egd=file:/dev/./urandom
CATALINA_OPTS=-Xms512M -Xmx1024M -server -XX:+UseParallelGC
```

emrecaglar *August 25, 2015*

hello.after creating a tomcat user, should not we change the user to tomcat somewhere?What is the password for tomcat user?After running tomcat, what should output be on console?

♡ 1

mordi34 *October 7, 2015*

Great tutorial! Thanks!

I found that I could not deploy (server would start but the webpage would not load) unless I gave tomcat rights to the webapps folder too (as we did for conf):

```
sudo chgrp -R tomcat webapps
sudo chmod g+rwx webapps
sudo chmod g+r webapps/*
```

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rr16566 *October 10, 2015*

How to uninstall it?

♡ 1

mariofalcaoes *October 22, 2015*

Important note: when you want to deploy a .war file don't forget to change permissions.. change "root" to "tomcat", you can do you it that way : chown -R tomcat:tomcat *

♡

mpatidar *October 23, 2015*

Very nice tutorial, I have installed java,tomcat and my sql server at three different machines with the help of this tutorial and in the installation process i didn't face single problem.

♡

mkthakral *November 2, 2015*

WGET mirror is returning 404.

♡

> danielb608a7172 *November 9, 2015*
>
> That's because 8.0.23 it's an older version, you just need to change it to 8.0.28 that is tha new version so it will be like this : wget http://mirror.sdunix.com/apache/tomcat/tomcat-8/v8.0.28/bin/apache-tomcat-8.0.28.tar.gz
>
> ♡

uwvarunb *November 19, 2015*

Tomcat 8 on Ubuntu 14.04, I had to add address="0.0.0.0" in order to access site from outside localhost.

```
<Connector port="8080" protocol="HTTP/1.1"
               connectionTimeout="20000"
               address="0.0.0.0"
               redirectPort="8443" />
```

altemir *November 30, 2015*

Great set of installation instructions, but I'm completely stumped ... I got to the point where I give the "tomcat" user write access to the "conf" directory:

```
sudo chgrp -R tomcat conf
```

I get the following error:

```
chgrp: cannot access ‘conf’: No such file or directory
```

I've searched high and low (maybe not effectively) and can't find the "conf" directory nor the "server.xml" or "modules.xml" files.

Any ideas as to why this could be happening?

> altemir *November 30, 2015*
>
> Answered my own question! .... turns out I installed the fulldocs binary instead of the core distribution. Feel silly.

rrrrrrrocky *November 30, 2015*

Great tutorial. Now that I installed tomcat and only the tomcat user can use it, I am facing issues while adding a server in eclipse. I get this error: *Could not load Tomcat server configuration at /opt/tomcat/conf. (Permission denied).* How do I fix that?

sudheer091 *December 1, 2015*

I'm getting an error as below

```
$ sudo initctl start tomcat
initctl : Unknown Job : tomcat
```

```
$
```

♡

mteofilo *December 9, 2015*

Hi,

I tried make this steps to install two tomcat 7 and 8.

Here is my issue on stackoverflow: http://stackoverflow.com/questions/34169861/two-tomcat-in-same-server-upstart-script-ubuntu-server.

Someone have some idea how to do this correctly?

Thanks.

♡

RonanC *December 12, 2015*

Thank you so much.
Worked perfectly for me!
This is why I love digital ocean.

♡

vtokmak *January 2, 2016*

Great tutorial. Thx a lot!

♡

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