



# How to Implement Apache Tomcat on USS

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*Session 19571*

#SHAREatl



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# Agenda

- Introduction
- Tomcat on Windows
- Tomcat (v7) on USS
  - Installation
  - Configuration
  - Diagnostics
- HTTPS setup – a simple example
- Tomcat v8 issue (ASF Bugzilla)
- How to build your own Tomcat?

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# Introduction

- **Apache Tomcat** is an open source Java **servlet** container that functions as a *web server*, developed by the Apache Software Foundation (ASF).
- Website: [tomcat.apache.org](http://tomcat.apache.org)
- Some popular web sites using Tomcat (standalone):
  - [aa.com](http://aa.com)
  - [gap.com](http://gap.com)
  - [southwest.com](http://southwest.com)
  - [zillow.com](http://zillow.com)
- Apache Tomcat vs. Apache HTTPD (Apache HTTP Server [httpd.apache.org](http://httpd.apache.org))
  - HTTPD – the world’s most used web server (52.1%, July 2016). Written in C: static web pages + add-on modules for dynamic contents; e.g., Perl, PHP, Python, etc.
  - Tomcat – written in Java: Java servlets, JSP; can also serve static contents
  - mod\_jk – an Apache module to connect Tomcat with other web servers such as Apache HTTPD
  - Some popular web sites using HTTPD (plus Tomcat?):
    - [apple.com](http://apple.com)
    - [paypal.com](http://paypal.com)
    - [nytimes.com](http://nytimes.com)

References: <https://w3techs.com/technologies/details/ws-tomcat/all/all>  
<https://w3techs.com/technologies/details/ws-apache/all/all>

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# Tomcat on Windows - Download

- <https://tomcat.apache.org/download-70.cgi>

7.0.69

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

## Binary Distributions

- Core:
  - [zip \(pgp, md5, sha1\)](#)
  - [tar.gz \(pgp, md5, sha1\)](#)
  - [32-bit Windows zip \(pgp, md5, sha1\)](#)
  - [64-bit Windows zip \(pgp, md5, sha1\)](#)
  - [64-bit Itanium Windows zip \(pgp, md5, sha1\)](#)
  - [32-bit/64-bit Windows Service Installer \(pgp, md5, sha1\)](#)
- Full documentation:
  - [tar.gz \(pgp, md5, sha1\)](#)
- Deployer:
  - [zip \(pgp, md5, sha1\)](#)
  - [tar.gz \(pgp, md5, sha1\)](#)
- Extras:
  - [JMX Remote jar \(pgp, md5, sha1\)](#)
  - [Web services jar \(pgp, md5, sha1\)](#)
  - [JULI adapters jar \(pgp, md5, sha1\)](#)
  - [JULI log4j jar \(pgp, md5, sha1\)](#)

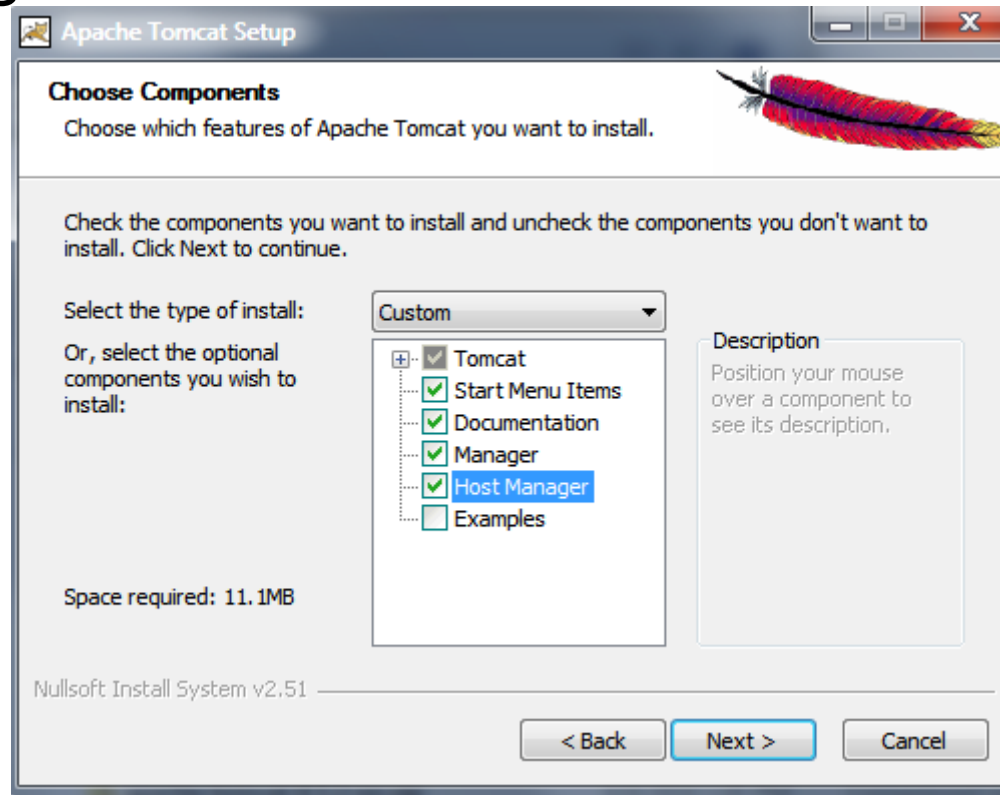
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# Tomcat on Windows - Installation

Select Host Manager for *Virtual Hosting* – Hosting multiple domains (websites) on a single server



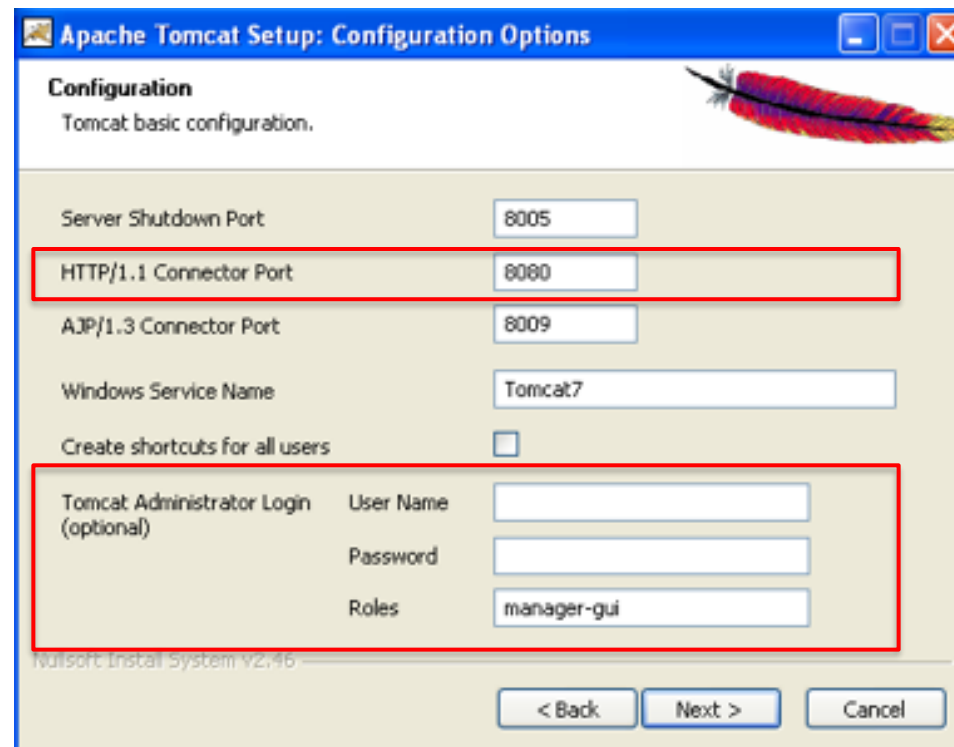
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# Tomcat on Windows - Installation

- Specify a userid/password for Tomcat Manager



Apache Tomcat Setup: Configuration Options

Configuration  
Tomcat basic configuration.

Server Shutdown Port: 8005

HTTP/1.1 Connector Port: 8080

AJP/1.3 Connector Port: 8009

Windows Service Name: Tomcat7

Create shortcuts for all users:

Tomcat Administrator Login (optional)

User Name	<input type="text"/>
Password	<input type="password"/>
Roles	manager-gui

Microsoft Install System v2.46

< Back Next > Cancel

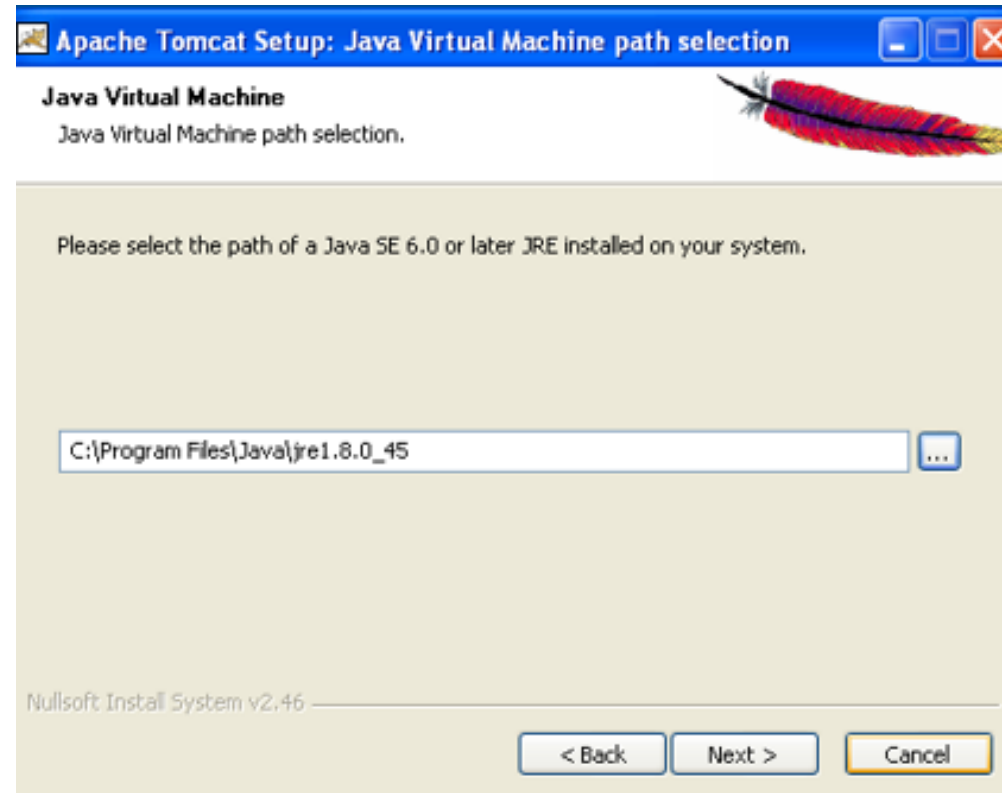
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# Tomcat on Windows - Installation

- Specify JVM



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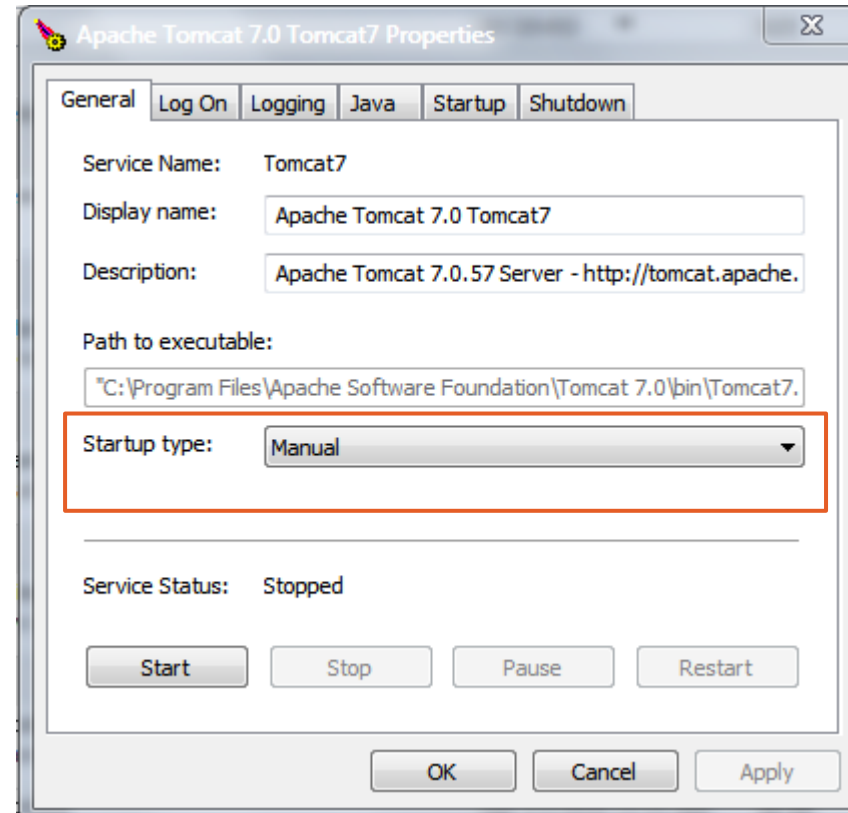
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# Tomcat on Windows - Configuration

Startup type:

- Automatic
- Manual
- Disabled



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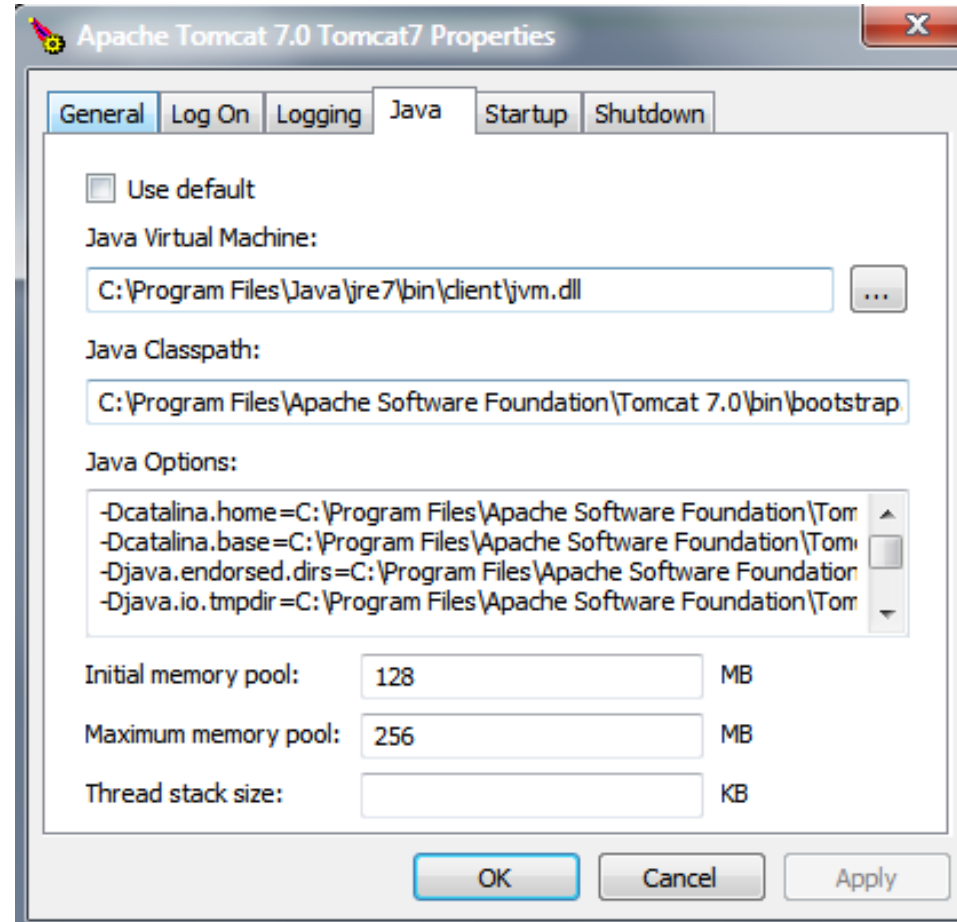
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# Tomcat on Windows - Configuration

## JVM setup



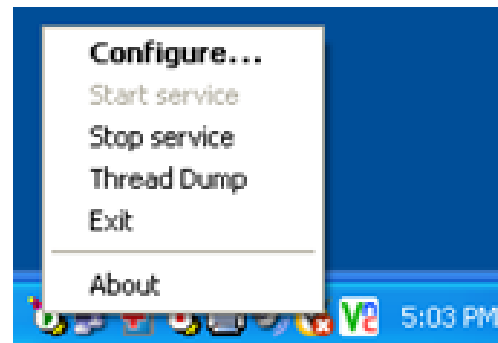
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# Tomcat on Windows - Operations

## Starting/Stopping Tomcat



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# Tomcat Operations - <http://localhost:8080>

[Home](#) [Documentation](#) [Configuration](#) [Examples](#) [Wiki](#) [Mailing Lists](#)

[Find Help](#)

## Apache Tomcat/7.0.69



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 Data Sources](#)

[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 7.0 access to the manager application is split between different users.

[Read more...](#)

[Release Notes](#)

[Changelog](#)

[Migration Guide](#)

[Security Notices](#)

### Documentation

[Tomcat 7.0 Documentation](#)

[Tomcat 7.0 Configuration](#)

[Tomcat Wiki](#)

Find additional important configuration information in:

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

Developers may be interested in:

[Tomcat 7.0 Bug Database](#)

[Tomcat 7.0 JavaDocs](#)

[Tomcat 7.0 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

# Tomcat Operations – Deploying a Web App



## Tomcat Web Application Manager

Message:

---

**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 ≥ <input type="text" value="30"/> minutes
/DNS	None specified		false	0	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/>
/IDS	None specified		true	0	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle ≥ <input type="text" value="5"/> minutes
/IDS.1.1	None specified		true	0	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle ≥ <input type="text" value="5"/> minutes
/TopixLinux	None specified		true	0	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle ≥ <input type="text" value="30"/> minutes
/aes	None specified		true	0	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle ≥ <input type="text" value="5"/> minutes
/docs	None specified	Tomcat Documentation	true	0	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle ≥ <input type="text" value="30"/> minutes
/manager	None specified	Tomcat Manager Application	true	1	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle ≥ <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

---

**Diagnostics**

Check to see if a web application has caused a memory leak on stop, reload or undeploy

This diagnostic check will trigger a full garbage collection. Use it with extreme caution on production systems.

---

**Server Information**

Tomcat Version	JVM Version	JVM Vendor	OS Name	OS Version	OS Architecture	Hostname	IP Address
Apache Tomcat/7.0.57	1.7.0_51-b13	Oracle Corporation	Windows 7	6.1	x86	Dave-PC	137.72.43.131

# Tomcat Operations – Deploying a Web App

<b>Deploy</b>	
<b>Deploy directory or WAR file located on server</b>	
Context Path (required):	<input type="text"/>
XML Configuration file URL:	<input type="text"/>
WAR or Directory URL:	<input type="text"/>
	<input type="button" value="Deploy"/>
<b>WAR file to deploy</b>	
Select WAR file to upload	<input type="button" value="Browse..."/> No file selected.
	<input type="button" value="Deploy"/>

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# Tomcat Operations – Deploying a Web App

**Deploy**

Deploy directory or WAR file located on server

Context Path (required):

XML Configuration file URL:

WAR or Directory URL:

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# Tomcat Operations – Running a Web App

localhost:8080/TcpipLinux/ui/control.action?waitPage=true

Logoff | Select Node | Help

**AES** **CleverView® for TCP/IP on Linux**

**Welcome to CleverView® for TCP/IP on Linux**

Please enter your logon information:

Server:  ✓

Server Port:  (Default:3306)

User ID:

Password:

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# Tomcat on USS - Download

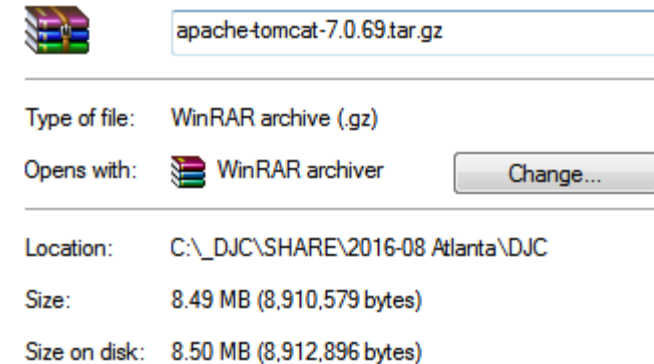
- <https://tomcat.apache.org/download-70.cgi>

7.0.69

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  - [32-bit Windows zip \(pgp, md5, sha1\)](#)
  - [64-bit Windows zip \(pgp, md5, sha1\)](#)
  - [64-bit Itanium Windows zip \(pgp, md5, sha1\)](#)
  - [32-bit/64-bit Windows Service Installer \(pgp, md5, sha1\)](#)
- Full documentation:
  - [tar.gz \(pgp, md5, sha1\)](#)
- Deployer:
  - [zip \(pgp, md5, sha1\)](#)
  - [tar.gz \(pgp, md5, sha1\)](#)
- Extras:
  - [JMX Remote jar \(pgp, md5, sha1\)](#)
  - [Web services jar \(pgp, md5, sha1\)](#)
  - [JULI adapters jar \(pgp, md5, sha1\)](#)
  - [JULI log4j jar \(pgp, md5, sha1\)](#)



apache-tomcat-7.0.69.tar.gz

Type of file: WinRAR archive (.gz)

Opens with: WinRAR archiver

Location: C:\\_DJC\SHARE\2016-08 Atlanta\DJC

Size: 8.49 MB (8,910,579 bytes)

Size on disk: 8.50 MB (8,912,896 bytes)

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# Tomcat on USS - Installation

- Pre-reqs
  - gzip command
    - download gzip.pax.Z.bin
    - pax –rvf gzip.pax.Z.bin
  - JVM
- gzip –d apache-tomcat-7.0.69.tar.gz
- tar –xvf apache-tomcat-7.0.69.tar

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# Tomcat on USS – Environment Variables

- `export CATALINA_HOME=/u/aes/apache-tomcat-7.0.69`
- `export JAVA_HOME=/usr/lpp/java/J8.0_64`

## Enhanced ASCII:

- `export _BPXK_AUTOCVT=ON`
- `chtag -t -c ISO8859-1 $CATALINA_HOME/bin/*.sh`

or convert \*.sh files from ASCII to EBCDIC:

- `iconv -f ISO8859-1 -t IBM-1047 file1 > file2`

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# Tomcat on USS – check file tag information

- `chtag -p <pathname>`

```
AESDJC1 : /u/aes/apache-tomcat-7.0.69/bin: >chtag -p *.sh
t IS08859-1      T=on   catalina.sh
t IS08859-1      T=on   configtest.sh
t IS08859-1      T=on   daemon.sh
t IS08859-1      T=on   digest.sh
t IS08859-1      T=on   setclasspath.sh
t IS08859-1      T=on   shutdown.sh
t IS08859-1      T=on   startup.sh
t IS08859-1      T=on   tool-wrapper.sh
t IS08859-1      T=on   version.sh
AESDJC1 : /u/aes/apache-tomcat-7.0.69/bin: >
```

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# Tomcat on USS – Directory Structure

```
AESDJC1 : /u/aes/apache-tomcat-7.0.69 : >ls -l
total 288
-rw-r--r-- 1 STCOPER IPGROUP 56846 Apr 11 02:59 LICENSE
-rw-r--r-- 1 STCOPER IPGROUP 1239 Apr 11 02:59 NOTICE
-rw-r--r-- 1 STCOPER IPGROUP 8965 Apr 11 02:59 RELEASE-NOTES
-rw-r--r-- 1 STCOPER IPGROUP 16195 Apr 11 02:59 RUNNING.txt
drwxr-xr-x 2 STCOPER IPGROUP 8192 Apr 11 02:59 bin
drwxr-xr-x 3 STCOPER IPGROUP 8192 May 25 19:13 conf
drwxr-xr-x 2 STCOPER IPGROUP 8192 Apr 11 02:58 lib
drwxr-xr-x 2 STCOPER IPGROUP 8192 May 25 19:13 logs
drwxr-xr-x 2 STCOPER IPGROUP 8192 Apr 11 02:58 temp
drwxr-xr-x 7 STCOPER IPGROUP 8192 Apr 11 02:58 webapps
drwxr-xr-x 3 STCOPER IPGROUP 8192 May 25 19:13 work
AESDJC1 : /u/aes/apache-tomcat-7.0.69 : >
```

<b>bin</b>	plugins, startup.sh, shutdown.sh, etc.
<b>conf</b>	configurations
<b>logs</b>	error/information logs
<b>webapps</b>	web applications
<b>work</b>	../work/Catalina/localhost/... cached data – may need to be manually cleaned up

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# Tomcat Host Manager

- Edit \$CATALINA\_HOME/conf/tomcat-users.xml
- Specify Data Encoding: ASCII (or UTF-8)

```
Menu Utilities View Options Help
-----
Workstation Help
-----
EDIT Entry Panel
More: +
Object Name:
/u/aes/apache-tomcat-7.0.69/conf/tomcat-users.xml
* No workstation connection
Initial Macro . . . _____
Profile Name . . . _____ (Blank defaults to Type)
Format Name . . . _____
Panel Name . . . _____ (Leave blank for default)
Record Length . . . _____
Line Command Table _____

Options                                Data Encoding
-- Confirm Cancel/Move/Replace        -- 1. ASCII
-- EDIT Mixed Mode                      -- 2. UTF-8
-- EDIT host file on
Workstation
-- Preserve VB record length
```

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# Tomcat Host Manager

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT      /u/aes/apache-tomcat-7.0.69/conf/tomcat-users.x Columns 00001 00072
Command ==> _____ Scroll ==> CSR
000018 <tomcat-users>
000019 <!--
000020 NOTE: By default, no user is included in the "manager-gui" role requi
000021 to operate the "/manager/html" web application. If you wish to use th
000022 you must define such a user - the username and password are arbitrary.
000023 -->
000024 <!--
000025 NOTE: The sample user and role entries below are wrapped in a comment
000026 and thus are ignored when reading this file. Do not forget to remove
000027 <!-- .. --> that surrounds them.
000028 -->
000029 <!--
000030 <role rolename="tomcat"/>
000031 <role rolename="role1"/>
000032 <user username="tomcat" password="tomcat" roles="tomcat"/>
000033 <user username="both" password="tomcat" roles="tomcat,role1"/>
000034 <user username="role1" password="tomcat" roles="role1"/>
000035 -->
000036 <user name="admin" password="admin" roles="manager-gui" />
000037 </tomcat-users>
***** Bottom of Data *****
```

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# Tomcat Host Manager – Tomcat 8 (and later):

## 403 Access Denied

You are not authorized to view this page.

By default the Host Manager is only accessible from a browser running on the same machine as Tomcat. If you wish to modify this restriction, you'll need to edit the Host Manager's `context.xml` file.

If you have already configured the Manager application to allow access and you have used your browser's back button, used a saved book-mark or similar then you may have triggered the cross-site request forgery (CSRF) protection that has been enabled for the HTML interface of the Manager application. You will need to reset this protection by returning to the [main Manager page](#). Once you return to this page, you will be able to continue using the Manager application's HTML interface normally. If you continue to see this access denied message, check that you have the necessary permissions to access this application.

If you have not changed any configuration files, please examine the file `conf/tomcat-users.xml` in your installation. That file must contain the credentials to let you use this webapp.

For example, to add the `manager-gui` role to a user named `tomcat` with a password of `s3cret`, add the following to the config file listed above.

```
<role rolename="manager-gui"/>
<user username="tomcat" password="s3cret" roles="manager-gui"/>
```

Note that for Tomcat 7 onwards, the roles required to use the manager application were changed from the single `manager` role to the following four roles. You will need to assign the role(s) required for the functionality you wish to access.

- `manager-gui` - allows access to the HTML GUI and the status pages
- `manager-script` - allows access to the text interface and the status pages
- `manager-jmx` - allows access to the JMX proxy and the status pages
- `manager-status` - allows access to the status pages only

The HTML interface is protected against CSRF but the text and JMX interfaces are not. To maintain the CSRF protection:

- Users with the `manager-gui` role should not be granted either the `manager-script` or `manager-jmx` roles.
- If the text or jmx interfaces are accessed through a browser (e.g. for testing since these interfaces are intended for tools not humans) then the browser must be closed afterwards to terminate the session.

For more information - please see the [Manager App HOW-TO](#).

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# Tomcat Host Manager – Tomcat 8 (and later):

Add a file: ***manager.xml*** in  
\$CATALINA\_HOME/conf/Catalina/localhost/

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT /u/aes/apache-tomcat-8.5.2/conf/Catalina/localhost Columns 00001 00072
Command ==> Scroll ==> CSR
*****
***** Top of Data *****
000001 <Context privileged="true" antiResourceLocking="false"
000002     docBase="/u/aes/apache-tomcat-8.5.2/webapps/manager" >
000003     <Valve className="org.apache.catalina.valves.RemoteAddrValve"
000004 allow="^.*$" />
000005 </Context>
*****
***** Bottom of Data *****
```

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# Tomcat on USS - Operations

- To Start Tomcat:

```
$CATALINA_HOME/bin/startup.sh
```

```
Using CATALINA_BASE:   /u/aes/apache-tomcat-7.0.69
Using CATALINA_HOME:   /u/aes/apache-tomcat-7.0.69
Using CATALINA_TMPDIR: /u/aes/apache-tomcat-7.0.69/temp
Using JRE_HOME:        /usr/lpp/java/J8.0_64
Using CLASSPATH:       /u/aes/apache-tomcat-7.0.69/bin/bootstrap.jar:/u/aes/apac
he-tomcat-7.0.69/bin/tomcat-juli.jar
Tomcat started.
```

- To Stop Tomcat

```
$CATALINA_HOME/bin/shutdown.sh
```

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# Tomcat Operations - <http://<ip address>:8080>

[Home](#) [Documentation](#) [Configuration](#) [Examples](#) [Wiki](#) [Mailing Lists](#)

[Find Help](#)

## Apache Tomcat/7.0.69



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

#### [Release Notes](#)

#### [Changelog](#)

#### [Migration Guide](#)

#### [Security Notices](#)

### Documentation

#### [Tomcat 7.0 Documentation](#)

#### [Tomcat 7.0 Configuration](#)

#### [Tomcat Wiki](#)

Find additional important configuration information in:

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

Developers may be interested in:

[Tomcat 7.0 Bug Database](#)

[Tomcat 7.0 JavaDocs](#)

[Tomcat 7.0 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

# Tomcat Operations - <http://<ip address>:8080> SHARE



## Tomcat Web Application Manager

Message:

**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 ≥ <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 ≥ <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 ≥ <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 ≥ <input type="text" value="30"/> minutes
/manager	None specified	Tomcat Manager Application	true	1	Start <input type="button" value="Stop"/> <input type="button" value="Reload"/> <input type="button" value="Undeploy"/> <input type="button" value="Expire sessions"/> with idle ≥ <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

**Diagnostics**  
 Check to see if a web application has caused a memory leak on stop, reload or undeploy

This diagnostic check will trigger a full garbage collection. Use it with extreme caution on production systems.

Server Information							
Tomcat Version	JVM Version	JVM Vendor	OS Name	OS Version	OS Architecture	Hostname	IP Address
Apache Tomcat/7.0.89	pmz6480sr2fp10-20160108_01 (SR2 FP10)	IBM Corporation	z/OS	02.02.00	s390x	-	-

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# How to Deploy a Web App Manually?

- Stop Tomcat
- Copy the war file to \$CATALINA\_HOME/webapps
- Start Tomcat

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# How to Remove a Web App Manually?

- Stop Tomcat
- Delete the web app's **war file** in \$CATALINA\_HOME/webapps
- Delete the web app's **directory** in \$CATALINA\_HOME/webapps
- Delete the web app's **directory** in \$CATALINA\_HOME/work/Catalina/localhost
- Start Tomcat

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# How to Configure Tomcat to Listen to a Different Port?

- Edit \$CATALINA\_HOME/conf/server.xml (ASCII encoding)
- Change Connector port="8080" to Connector Port="nnnn"

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT /u/aes/apache-tomcat-7.0.69/conf/server.xml Columns 00001 00072
Command ==> Scroll ==> CSR
000071 <Connector port="8080" protocol="HTTP/1.1"
000072         connectionTimeout="20000"
000073         redirectPort="8443" />
000074 <!-- A "Connector" using the shared thread pool-->
000075 <!--
000076 <Connector executor="tomcatThreadPool"
000077         port="8080" protocol="HTTP/1.1"
000078         connectionTimeout="20000"
000079         redirectPort="8443" />
000080 -->
000081 <!-- Define a SSL HTTP/1.1 Connector on port 8443
000082     This connector uses the BIO implementation that requires the JS
000083     style configuration. When using the APR/native implementation,
000084     OpenSSL style configuration is required as described in the APR
000085     documentation -->
000086 <!--
000087 <Connector port="8443" protocol="org.apache.coyote.http11.Http11Prot
000088         maxThreads="150" SSLEnabled="true" scheme="https" secure=
000089         clientAuth="false" sslProtocol="TLS" />
000090 -->
000091
```

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# Tomcat log files – in \$CATALINA\_HOME/logs/

- Sample problem: could not find JVM

```
commons-daemon.2016-02-11.log - Notepad
File Edit Format View Help
[2016-02-11 13:01:51] [info] [1444] Commons Daemon procrun (1.0.15.0 32-bit) started
[2016-02-11 13:01:51] [info] [1444] Running 'Tomcat7' Service...
[2016-02-11 13:01:51] [info] [1520] Starting service...
[2016-02-11 13:01:52] [error] [1520] Failed creating java C:\Program Files (x86)\Java\jre1.8.0_65\bin\client\jvm.dll
[2016-02-11 13:01:52] [error] [1520] The system cannot find the path specified.
[2016-02-11 13:01:52] [error] [1520] ServiceStart returned 1
[2016-02-11 13:01:52] [error] [1520] The system cannot find the path specified.
[2016-02-11 13:02:02] [info] [1444] Run service finished.
[2016-02-11 13:02:02] [info] [1444] Commons Daemon procrun finished
[2016-02-11 13:07:59] [info] [2976] Commons Daemon procrun (1.0.15.0 32-bit) started
[2016-02-11 13:07:59] [info] [2976] Running 'Tomcat7' Service...
[2016-02-11 13:07:59] [info] [724] Starting service...
[2016-02-11 13:07:59] [error] [724] Failed creating java C:\Program Files (x86)\Java\jre1.8.0_65\bin\client\jvm.dll
[2016-02-11 13:08:00] [error] [724] The system cannot find the path specified.
[2016-02-11 13:08:00] [error] [724] ServiceStart returned 1
[2016-02-11 13:08:00] [error] [724] The system cannot find the path specified.
[2016-02-11 13:08:00] [info] [2976] Run service finished.
[2016-02-11 13:08:00] [info] [2976] Commons Daemon procrun finished
[2016-02-11 13:10:37] [info] [852] Commons Daemon procrun (1.0.15.0 32-bit) started
[2016-02-11 13:10:37] [info] [852] Running 'Tomcat7' Service...
[2016-02-11 13:10:37] [info] [2532] Starting service...
[2016-02-11 13:10:37] [error] [2532] Failed creating java C:\Program Files (x86)\Java\jre1.8.0_65\bin\client\jvm.dll
[2016-02-11 13:10:37] [error] [2532] The system cannot find the path specified.
[2016-02-11 13:10:37] [error] [2532] ServiceStart returned 1
[2016-02-11 13:10:37] [error] [2532] The system cannot find the path specified.
[2016-02-11 13:10:37] [info] [852] Run service finished.
[2016-02-11 13:10:37] [info] [852] Commons Daemon procrun finished
```

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# How to Deploy SSL (https) on USS

- Generating a Keystore file (do this on Windows)
- Transfer the Keystore file to  
\$CATALINA\_HOME/webapps/
- Configure \$CATALINA\_HOME/conf/server.xml
- Restart Tomcat
- Access the web app via https://<ip address>:8080/...

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# How to Deploy SSL (https) on USS?

## Generating a Keystore file (do this on Windows)

- Open the command prompt and access JDK/JRE's **bin** directory.
- Use the Java **keytool** command to generate a Keystore file:  
`keytool -genkey -alias aesclever -keypass aesclever -keystore aesclever.bin -storepass aesclever`
- In this example we use **aesclever** as the alias and the password for the key, and **aesclever.bin** as the Keystore file name. You may use other values of your choice.

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# How to Deploy SSL (https) on USS?

## Generating a Keystore file – continued

It would now start a questionnaire. So fill in the **relevant** details accordingly. Look below for a reference as to what to answer for the questions.

```
What is your first and last name?  
[Unknown]: Joe Smith  
What is the name of your organizational unit?  
[Unknown]: support  
What is the name of your organization?  
[Unknown]: AES  
What is the name of your City or Locality?  
[Unknown]: Menlo Park  
What is the name of your State or Province?  
[Unknown]: CA  
What is the two-letter country code for this unit?  
[Unknown]: CA  
Is CN=Joe Smith, OU=support, O=AES, L=Menlo Park, ST=CA, C=CA correct?  
[no]: yes
```

The command would then conclude and create the Keystore file **aesclever.bin**.

Transfer the Keystore file (e.g., aesclever.bin) to \$CATALINA\_HOME/webapps/

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# How to Deploy SSL (https) on USS?

Edit `$CATALINA_HOME/conf/server.xml` (ASCII Encoding)

Find the **Connector** element which has `port="8443"` and **uncomment** it, then add two lines.

**Change from:**

```
<!--  
<Connector port="8443" protocol="org.apache.coyote.http11.Http11Protocol"  
    maxThreads="150" SSLEnabled="true" scheme="https" secure="true"  
    clientAuth="false" sslProtocol="TLS" />
```

```
-->
```

**To:**

```
<Connector port="8443" protocol="org.apache.coyote.http11.Http11Protocol"  
    maxThreads="150" SSLEnabled="true" scheme="https" secure="true"  
    clientAuth="false" sslProtocol="TLS"  
    keystoreFile="webapps/aesclever.bin"  
    keystorePass="aesclever" />
```

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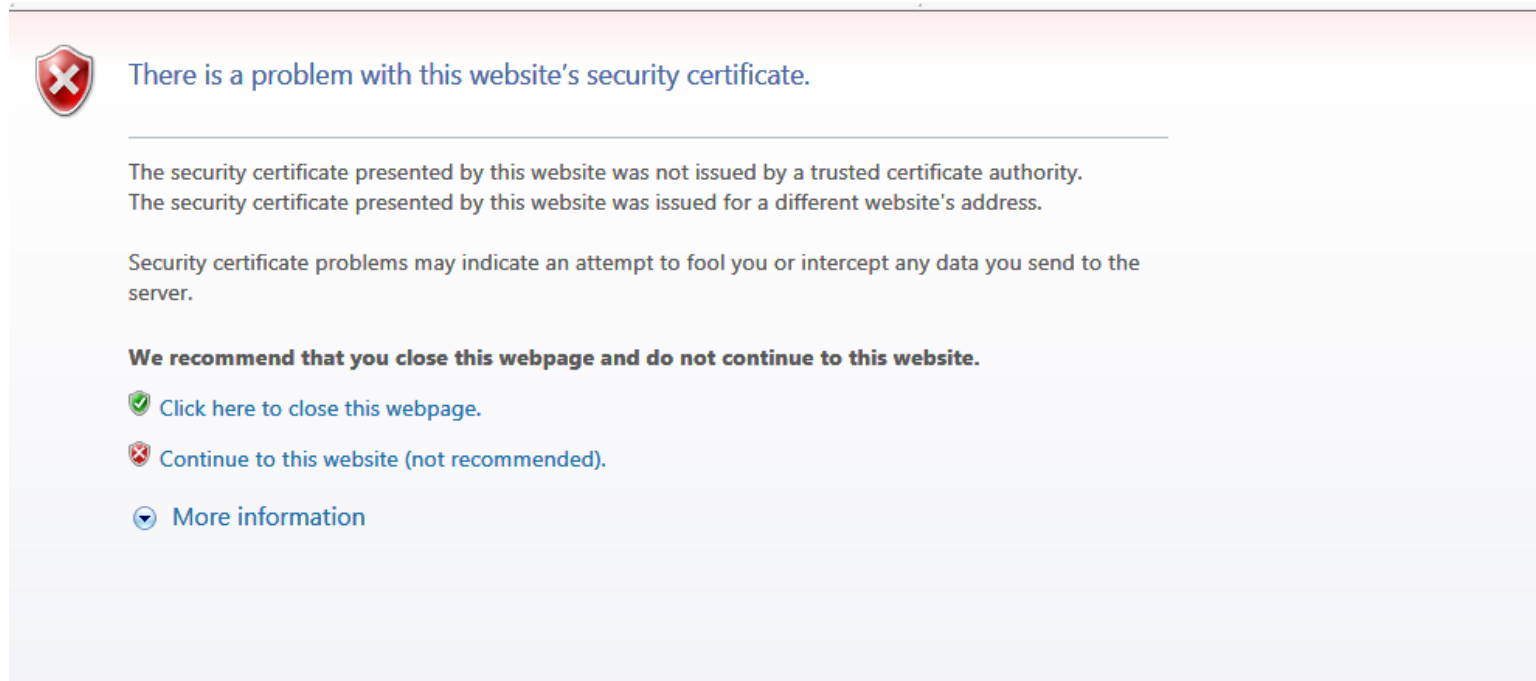
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# How to Deploy SSL (https) on USS?

## Test with <https://ipaddress:8443/....>

Since the certificate was not generated by a trusted authority such as VeriSign, the older Browser will give a warning message when you try to access the page with https. The new Browsers will reject the request.

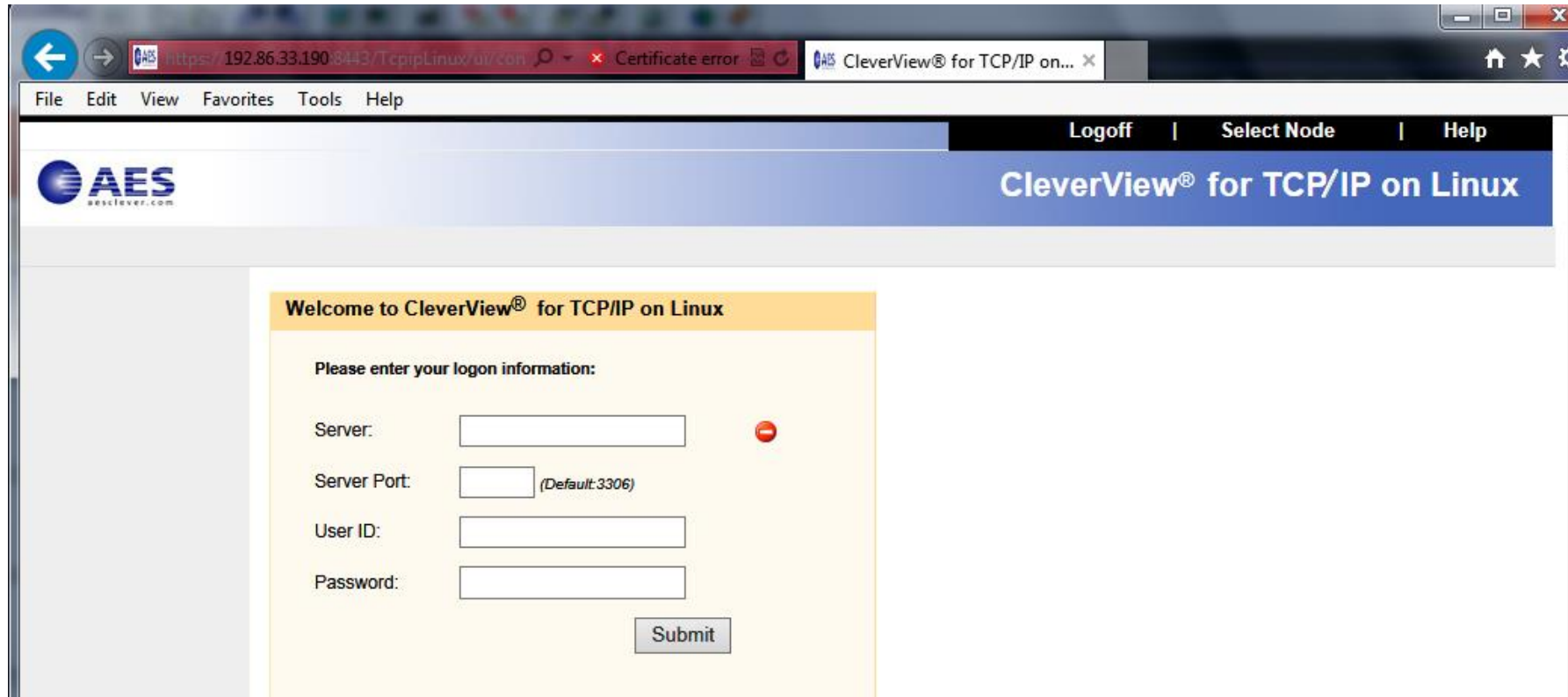


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# How to Deploy SSL (https) on USS?



More info: <https://www.mulesoft.com/tcat/tomcat-ssl>

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# z/OS Encoding Issue with Tomcat 8.5.2 and above

```
26-May-2016 15:29:01.998 INFO [main] org.apache.catalina.startup.Catalina.load Initialization processed in 2540 ms
26-May-2016 15:29:02.079 INFO [main] org.apache.catalina.core.StandardService.startInternal Starting service Catalina
26-May-2016 15:29:02.080 INFO [main] org.apache.catalina.core.StandardEngine.startInternal Starting Servlet Engine: Apac
26-May-2016 15:29:02.175 INFO [localhost-startStop-1] org.apache.catalina.startup.HostConfig.deployDirectory Deploying w
26-May-2016 15:29:02.184 SEVERE [localhost-startStop-1] org.apache.catalina.core.ContainerBase.addChildInternal Containe
org.apache.catalina.LifecycleException: Failed to start component [StandardEngine[Catalina].StandardHost[localhost].Sta
    at org.apache.catalina.util.LifecycleBase.start(LifecycleBase.java:153)
    at org.apache.catalina.core.ContainerBase.addChildInternal(ContainerBase.java:725)
    at org.apache.catalina.core.ContainerBase.addChild(ContainerBase.java:701)
    at org.apache.catalina.core.StandardHost.addChild(StandardHost.java:717)
    at org.apache.catalina.startup.HostConfig.deployDirectory(HostConfig.java:1092)
    at org.apache.catalina.startup.HostConfig$DeployDirectory.run(HostConfig.java:1834)
    at java.util.concurrent.Executors$RunnableAdapter.call(Executors.java:522)
    at java.util.concurrent.FutureTask.run(FutureTask.java:277)
    at java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1153)
    at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)
    at java.lang.Thread.run(Thread.java:785)
Caused by: java.lang.IllegalArgumentException: Invalid <url-pattern> → in filter mapping
    at org.apache.catalina.core.StandardContext.validateFilterMap(StandardContext.java:2960)
    at org.apache.catalina.core.StandardContext.addFilterMap(StandardContext.java:2909)
    at org.apache.catalina.core.ApplicationFilterRegistration.addMappingForUrlPatterns(ApplicationFilterRegistration.java:
    at org.apache.tomcat.websocket.server.WsServerContainer.<init>(WsServerContainer.java:143)
    at org.apache.tomcat.websocket.server.WsSci.init(WsSci.java:131)
    at org.apache.tomcat.websocket.server.WsSci.onStartup(WsSci.java:47)
    at org.apache.catalina.core.StandardContext.startInternal(StandardContext.java:5240)
    at org.apache.catalina.util.LifecycleBase.start(LifecycleBase.java:147)
    ... 10 more
```

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- Finally, before submitting your first report, DO read the bug submission guidelines at <http://issues.apache.org/bugwritinghelp.html>. Following the guidelines will assure the bug is resolved much more quickly.



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# Apache Software Foundation Bug Reporting

ASF Bugzilla – Bug 59604 Invalid url-pattern in servlet mapping on s390x Last modified: 2016-06-01 11:28:56 UTC

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## Bug 59604 - Invalid url-pattern in servlet mapping on s390x

**Status:** RESOLVED FIXED

**Reported:** 2016-05-20 00:54 UTC by Dave

**Product:** Tomcat 8

**Modified:** 2016-06-01 11:28 UTC ([History](#))

**Component:** Catalina

**CC List:** 0 users

**Version:** 8.0.33

**Hardware:** Other other

**Importance:** P2 major ([vote](#))

**Target Milestone:** ----

**Assigned To:** Tomcat Developers Mailing List

**URI:**

**Keywords:**

**Depends on:**

**Blocks:**

Show dependency [tree](#)

Attachments	
<a href="#">log file</a> (26.95 KB, text/plain) 2016-05-20 00:54 UTC, Dave	<a href="#">Details</a>
<a href="#">modified web.xml for ROOT</a> (338 bytes, text/xml) 2016-05-25 00:47 UTC, Dave	<a href="#">Details</a>
<a href="#">log file with only ROOT app</a> (11.76 KB, text/plain) 2016-05-25 00:48 UTC, Dave	<a href="#">Details</a>
<a href="#">conf/web.xml (did not make any changes)</a> (164.87 KB, text/xml) 2016-05-26 01:23 UTC, Dave	<a href="#">Details</a>
<a href="#">log file with nothing in webapps/</a> (8.20 KB, text/plain) 2016-05-26 01:24 UTC, Dave	<a href="#">Details</a>
<a href="#">minimum /conf/web.xml</a> (777 bytes, text/xml) 2016-05-26 20:25 UTC, Dave	<a href="#">Details</a>
<a href="#">"bare bones" conf/web.xml</a> (312 bytes, application/xml) 2016-05-26 20:32 UTC, Dave	<a href="#">Details</a>
<a href="#">log file with bare bones conf/web.xml</a> (11.59 KB, text/plain) 2016-05-26 20:34 UTC, Dave	<a href="#">Details</a>
<a href="#">Add an attachment</a> (proposed patch, testcase, etc.)	<a href="#">View All</a>

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# Tomcat Bug 59604

## ASF Bugzilla – Activity log for bug 59604: Invalid url-pattern in servlet mapping on s390x

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Who	When	What	Removed	Added
davec	2016-05-20 00:55:55 UTC	Summary	Invalid url-pattern in servlet mapping	Invalid url-pattern in servlet mapping on s390x
markt	2016-05-20 09:37:14 UTC	Status	NEW	NEEDINFO
davec	2016-05-20 22:32:56 UTC	Status	NEEDINFO	NEW
markt	2016-05-22 18:17:44 UTC	Status	NEW	NEEDINFO
davec	2016-05-23 19:08:50 UTC	Status	NEEDINFO	NEW
markt	2016-05-24 19:52:06 UTC	Status	NEW	NEEDINFO
davec	2016-05-25 00:56:32 UTC	Status	NEEDINFO	NEW
markt	2016-05-25 06:20:37 UTC	Status	NEW	NEEDINFO
davec	2016-05-26 01:24:52 UTC	Status	NEEDINFO	NEW
markt	2016-06-01 11:28:56 UTC	Resolution	---	FIXED
		Status	NEW	RESOLVED

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# Tomcat Bug 59604

Dave 2016-05-31 18:54:29 UTC

[Comment 24](#)

OK. Mark, I will send the z/OS shell access info to you.

Mark Thomas 2016-06-01 11:28:56 UTC

[Comment 25](#)

Thanks for the shell access. It really speed up debugging this.

The bug has been fixed in:

- trunk for 9.0.0.M7 onwards
- 8.5.x for 8.5.3 onwards
- 8.0.x for 8.0.36 onwards

7.0.x and earlier were not affected.

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# How to Build Your Own Tomcat (v8.5.2)?

- <http://svn.apache.org/repos/asf/tomcat/tc8.0.x/trunk/BUILDING.txt>
- [Tomcat source code directory:](#)

Name	Date modified	Type	Size
bin	6/7/2016 3:05 PM	File folder	
conf	6/7/2016 3:05 PM	File folder	
java	6/6/2016 1:48 PM	File folder	
modules	6/6/2016 1:49 PM	File folder	
output	6/6/2016 3:19 PM	File folder	
res	6/7/2016 3:05 PM	File folder	
temp1	6/6/2016 3:06 PM	File folder	
test	6/7/2016 3:05 PM	File folder	
webapps	6/6/2016 1:49 PM	File folder	
.gitignore	6/6/2016 1:48 PM	GITIGNORE File	2 KB
build.properties.default	6/6/2016 1:48 PM	DEFAULT File	12 KB
build.xml	6/6/2016 1:48 PM	XML Document	129 KB
<b>BUILDING.txt</b>	6/6/2016 1:48 PM	Text Document	18 KB
KEYS	6/6/2016 1:48 PM	File	35 KB
LICENSE	6/6/2016 1:48 PM	File	57 KB
NOTICE	6/6/2016 1:48 PM	File	2 KB
RELEASE-NOTES	6/6/2016 1:48 PM	File	8 KB
RUNNING.txt	6/6/2016 1:48 PM	Text Document	17 KB
SVN-MERGE.txt	6/6/2016 1:48 PM	Text Document	3 KB

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# How to Build Your Own Tomcat (v8.5.2)?

- Download and install **JDK** 7 or later (e.g., jdk-8u92)
- Download and install Apache **Ant** (“*another neat tool*” 😊 )  
v1.9.5 or later (e.g., v1.9.7)
- Set up Windows Environment Variables:
  - JAVA\_HOME=JDK directory
  - Add JDK and Ant bin directories to PATH
- Download the Tomcat source code

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# How to Build Your Own Tomcat?

- Under Tomcat's source code directory:
  - Copy *build.properties.default* to *build.properties*
  - Edit *build.properties*:
    - Change: `base.path=${user.home}/tomcat-build-libs`
    - To: `base.path=temp1`

All temporary files will be downloaded to the temp1 directory under Tomcat's source code directory

  - Run Ant to build/rebuild: `ant`
  - A usable Tomcat will be in: `Tomcat source\output\build`

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# Applying My Own Patch for Bug 59604

- Edit **UDecode.java** in Tomcat source\java\org\apache\tomcat\util\buf

```
1 ■■■■■ java/org/apache/tomcat/util/buf/UDecoder.java View
@@ -329,6 +329,7 @@ public static String URLDecode(String str, String enc, boolean isQuery) {
    try {
    329 329         if (enc == null) {
    330 330             bytes = str.getBytes(StandardCharsets.ISO_8859_1);
    331 331             + enc = "ISO-8859-1";
    332 333         } else {
    333 334             bytes = str.getBytes(B2CConverter.getCharset(enc));
    334 335         }

```

- Rebuild Tomcat
- Replace Tomcat's lib/**tomcat-util.jar** with the updated version in Tomcat source\output\build\lib

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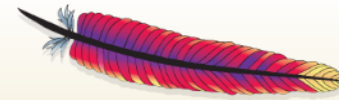
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# Tomcat 8.5.3 and 8.5.4



## Apache Tomcat 8

Version 8.5.3, Jun 9 2016



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## Tomcat Web Application Manager How To

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### Introduction

In many production environments it is very useful to have the capability to manage your web applications without having to shut down and restart Tomcat. This document is for the HTML web interface to the web application [manager](#).

## Tomcat 8.5.4 released on July 12, 2016

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