



Application Instrumentation – Tomcat

Java

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About this Document

This document provides VSP application instrumentation steps for Tomcat Application Server (Java) and provides steps to determine the values of Deployment Folder and Start-up Script path required during Application configuration on CMS.



NOTE:

Variables `%CATALINA_HOME%` and `$CATALINA_HOME` used throughout this document refer to the root directory where Tomcat Application Server is installed in Windows and Linux operating systems respectively. Some sample values are provided below:

- `%CATALINA_HOME%` - `D:\tomcat-7.0.85\`
- `$CATALINA_HOME` - `/opt/tomcat-7.0.85/`

1. Windows

1.1. Auto-Instrumentation

1. Application Deployment Folder

- a. Log in to the Virtual Machine where Tomcat is installed
- b. Utilize the below path as **Application Deployment Folder**
`%CATALINA_HOME%\webapps`
- c. **Example:** `D:\tomcat-7.0.85\webapps`

2. Startup Script File Path

- a. Provide the below path as Startup Script File Path
`%CATALINA_HOME%\bin\setEnv.bat`
- b. **Example:** `D:\tomcat-7.0.85\bin\setEnv.bat`

1.2. Manual Instrumentation

Supported Windows Version: The following configuration is tested on **Windows 2016** Operating System. To manually configure **Tomcat Server** with **VSP**, follow the steps below:

Method 1: Script based startup:

1. Shut down Tomcat Server (if it is running) using the command:
`%CATALINA_HOME%\bin\shutdown.bat`
2. Create a file `setEnv.bat` in the directory `%CATALINA_HOME%\bin`. Add content below to the file:

```
@echo off
ECHO.%JAVA_TOOL_OPTIONS%| FIND /I "instrumentation.jar">Nul || (
set JAVA_TOOL_OPTIONS=%JAVA_TOOL_OPTIONS% -javaagent:"%VSP_HOME%\iae-java\instrumentation.jar
-Dvirsec_appcontextpath=<AppCollectiveID>
)
```



NOTE:

Ensure that `<AppCollectiveID>` mentioned above is replaced with the App Collective ID in the CMS Application Configuration section

3. Save the modified file `setEnv.bat`
4. Start the Tomcat Server using the command:
`%CATALINA_HOME%\bin\startup.bat`

Method 2: Tomcat Services based Startup:

1. If the Tomcat Server is running, shut down the server using Windows Services

Example Service Name: Apache_Tomcat-7

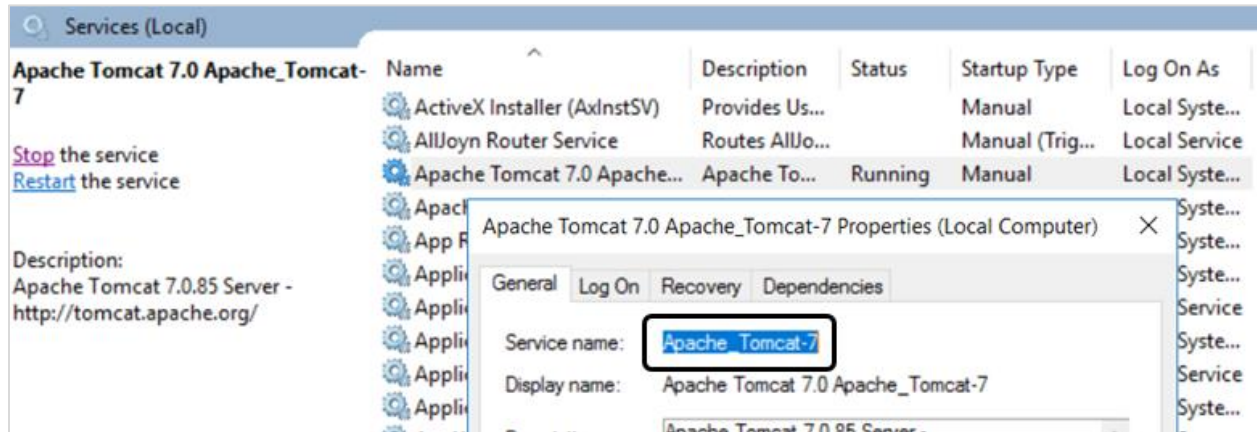
2. Navigate to the directory: %CATALINA_HOME%\bin

Example: D:\tomcat-7.0.85\bin

3. Open command prompt

4. Right-click on properties and procure the value of **Service Name**

Example: Apache_Tomcat-7



5. Edit the parameters of the service:

- a. In the **Java** tab, modify the parameters, **Java Options** to add the **Service Name** (obtained in Step 4)

```
D:\tomcat-7.0.85\bin>tomcat7w.exe //ES//Apache_Tomcat-7
```

- b. Add **VSP JVM** argument to **Java Options** as described below

- i. **Before Modification:**

```
-Dcatalina.home=D:\tomcat-7.0.85
-Dcatalina.base=D:\tomcat-7.0.85
-Dignore.endorsed.dirs=D:\tomcat-7.0.85\endorsed
-Djava.io.tmpdir=D:\tomcat-7.0.85\temp
-Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
-Djava.util.logging.config.file=D:\tomcat-7.0.85\conf\logging.properties
```

ii. **After Modification:**

```

-Dcatalina.home=D:\tomcat-7.0.85
-Dcatalina.base=D:\tomcat-7.0.85
-Dignore.endorsed.dirs=D:\tomcat-7.0.85\endorsed
-Djava.io.tmpdir=D:\tomcat-7.0.85\temp
-Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
-Djava.util.logging.config.file=D:\tomcat-7.0.85\conf\logging.properties
-javaagent:c:\PROGRA~2\Virsec\iae-java\instrumentation.jar
-Dvirsec_appcontextpath=<AppCollectiveID>
  
```


NOTE:

Ensure that <AppCollectiveID> mentioned above is replaced with the App Collective ID in the CMS Application Configuration section

6. Start the Tomcat Server using Windows Services

Example Service Name: Apache_Tomcat-7

2. Linux

2.1. Auto-Instrumentation

 1. **Application Deployment Folder**

- a. Log in to the Virtual Machine where Tomcat is installed
- b. Utilize the below path as **Application Deployment Folder**
\$CATALINA_HOME/webapps
- c. **Example:** /opt/tomcat-7.0.85/webapps

 2. **Startup Script File Path**

- a. Provide the below path as Startup Script File Path
\$CATALINA_HOME/bin/setenv.sh
- b. **Example:** /opt/tomcat-7.0.85/bin/setenv.sh

2.2. Manual Instrumentation

Supported Linux Version: The following configuration is tested on **RHEL 7.5** Operating System. To manually configure **Tomcat Server** with **VSP**, follow the steps below:

1. Shut down the Tomcat Server (if it is running) using the script
`$CATALINA_HOME/bin/shutdown.sh`
2. Create a file `setEnv.sh` in the directory `$CATALINA_HOME/bin`. Add the below content to the file:

```
export JAVA_TOOL_OPTIONS="$JAVA_TOOL_OPTIONS
-javaagent:/opt/virsec/iae-java/instrumentation.jar
-DVSP_HOME=/opt/virsec -Dvirsec_appcontextpath=<AppCollectiveID>"
```


NOTE:

Ensure that `<AppCollectiveID>` mentioned above is replaced with the App Collective ID in the CMS Application Configuration section

3. Start the Tomcat Server using any one of the below methods:
 - a. Method 1: Using Startup Script:
 - i. `$CATALINA_HOME/bin/startup.sh`
 - b. Method 2: Using init service:
 - i. **Example:** `systemctl start <tomcat-service-name>`
 - ii. A sample `tomcat.service` script is provided below. Verify that the variable `WorkingDirectory` is present. If it is not, add it as depicted below:

```
# Systemd unit file for tomcat
[Unit]
Description=Apache Tomcat Web Application Container
After=syslog.target network.target

[Service]
Type=forking

Environment=JAVA_HOME=/opt/jdk1.8.0_161
Environment=CATALINA_PID=/opt/apache-tomcat-8.5.30/temp/tomcat.pid
Environment=CATALINA_HOME=/opt/apache-tomcat-8.5.30
Environment=CATALINA_BASE=/opt/apache-tomcat-8.5.30

Environment='CATALINA_OPTS=-Xms512M -Xmx1024M -server -XX:+UseParallelGC'
Environment='JAVA_OPTS=-Djava.awt.headless=true -
Djava.security.egd=file:/dev/./urandom'

WorkingDirectory=/opt/apache-tomcat-8.5.30
ExecStart=/opt/apache-tomcat-8.5.30/bin/startup.sh
ExecStop=/bin/kill -15 $MAINPID
```

```
User=tomcat  
Group=tomcat  
  
[Install]  
WantedBy=multi-user.target
```

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