

# JMX exporter for Tomcat server monitoring

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## Ojective

In order for Tomcat server to be monitored by prometheus a java agent need to be installed. java agent will intercept Tomcat server and expose the metrics via configured port for prometheus to scrape. An extra config need to be added to catalina.sh file and custom java agent for this to work.

## Goal

Java agent is installed and metrix is exposed on designated port to be scraped by prometheus.

### 1. Create directory to place java agent and config file.

Create directory for java agent, in this case it is placed on /opt path

```
mkdir /opt/jmx_exporter
```

Download the latest java agent JMX\_Eporter to newly created path

[Github page](#) In case the link inaccessible

```
wget  
https://repo1.maven.org/maven2/io/prometheus/jmx/jmx_prometheus_javaagent/0.16.1/j  
mx_prometheus_javaagent-0.16.1.jar
```

Copy and paste the follow config in tomcat.yml file

```
---  
lowercaseOutputLabelNames: true  
lowercaseOutputName: true  
whitelistObjectNames: ["java.lang:type=OperatingSystem", "Catalina:*"]  
blacklistObjectNames: []  
rules:  
  - pattern: 'Catalina<type=Server><>serverInfo: (.+)'  
    name: tomcat_serverinfo  
    value: 1  
    labels:  
      serverInfo: "$1"  
    type: COUNTER  
  - pattern: 'Catalina<type=GlobalRequestProcessor, name=\"(\\w+-\\w+)-(\\d+)\"><>  
(\\w+):'  
    name: tomcat_$3_total  
    labels:  
      port: "$2"
```

```

    protocol: "$1"
    help: Tomcat global $3
    type: COUNTER
  - pattern: 'Catalina<j2eeType=Servlet, WebModule=//([-a-zA-Z0-9+&@#/%?
= ~|!:. ,;]*[-a-zA-Z0-9+&@#/%= ~|]), name=([-a-zA-Z0-9+/$% ~-|! .]*),
J2EEApplication=none, J2EEServer=none><>(requestCount|processingTime|errorCount):'
    name: tomcat_servlet_$3_total
    labels:
      module: "$1"
      servlet: "$2"
    help: Tomcat servlet $3 total
    type: COUNTER
  - pattern: 'Catalina<type=ThreadPool, name="(\w+-\w+)-(\d+)"><>
(currentThreadCount|currentThreadsBusy|keepAliveCount|connectionCount|acceptCount|
acceptorThreadCount|pollerThreadCount|maxThreads|minSpareThreads):'
    name: tomcat_threadpool_$3
    labels:
      port: "$2"
      protocol: "$1"
    help: Tomcat threadpool $3
    type: GAUGE
  - pattern: 'Catalina<type=Manager, host=([-a-zA-Z0-9+&@#/%?= ~|!:. ,;]*[-a-zA-Z0-
9+&@#/%= ~|]), context=([-a-zA-Z0-9+/$% ~-|! .]*)><>
(processingTime|sessionCounter|rejectedSessions|expiredSessions):'
    name: tomcat_session_$3_total
    labels:
      context: "$2"
      host: "$1"
    help: Tomcat session $3 total
    type: COUNTER

```

Make sure both of this file is present in the directory.

```

[root@tomcat jmx_exporter]# pwd
/opt/jmx_exporter
[root@tomcat jmx_exporter]# ls
jmx_prometheus_javaagent-0.16.1.jar  tomcat.yaml
[root@tomcat jmx_exporter]# |

```

Set necessary permission to the config file and java agent.

```
chown -R tomcat:tomcat ./jmx_exporter
```

## 2. Edit Tomcat configuration file and append additional environment variable for JMX Exporter

Best practice is not to edit the catalina.sh file directly, please create and put additional config in setenv.sh file and apply necessary permission so that it can be executed.

Tomcat installation path depends on how it is installed initially. In this case the path will be at /opt/tomcat/bin

```
[root@tomcat bin]# pwd
/opt/tomcat/bin
[root@tomcat bin]# ls
bootstrap.jar      ciphers.sh          daemon.sh            setenv.sh            tomcat-juli.jar      version.sh
catalina.bat       commons-daemon.jar  digest.bat           shutdown.bat         tomcat-native.tar.gz
catalina.sh         commons-daemon-native.tar.gz  digest.sh            shutdown.sh          tool-wrapper.bat
catalina-tasks.xml configtest.bat       setclasspath.bat    startup.bat          tool-wrapper.sh
ciphers.bat         configtest.sh       setclasspath.sh     startup.sh           version.bat
```

Create setenv.sh

```
touch setenv.sh
```

Add this line to the setenv.sh file

```
JAVA_OPTS="-javaagent:/opt/jmx_exporter/jmx_prometheus_javaagent-0.16.1.jar=20000:/opt/jmx_exporter/tomcat.yaml"
```

Set necessary permission and make it executeable.

```
chown tomcat:tomcat setenv.sh
chmod +x setenv.sh
```

ENV Variable explanation

```
-javaagent:/opt/jmx_exporter/jmx_prometheus_javaagent-0.16.1.jar - Absolute Path
to the java agent
=20000 - Number of port that the metrics will be exposed
:/opt/jmx_exporter/tomcat.yaml - Config file that will be loaded by java agent
```

Restart Tomcat server for the configuration to take effect.

```
systemctl restart tomcat
```

3. If there is no error after restarting the Tomcat Server java agent installation is successful.

Check port binding to java process. it will display port 20000 in listening state.

```
[root@tomcat bin]# ss -tlpn
State      Recv-Q  Send-Q           Local Address:Port           Peer Address:Port
LISTEN     0        128             *:22                          *:*
```

State	Recv-Q	Send-Q	Local Address:Port	Peer Address:Port
LISTEN	0	100	127.0.0.1:25	*:*
LISTEN	0	100	:::8080	:::*
LISTEN	0	128	:::22	:::*
LISTEN	0	100	:::1:25	:::*
LISTEN	0	3	:::20000	:::*
LISTEN	0	1	::ffff:127.0.0.1:8005	:::*

```
users:(("sshd",pid=892,fd=3))
users:(("master",pid=1087,fd=13))
users:(("java",pid=919,fd=61))
users:(("sshd",pid=892,fd=4))
users:(("master",pid=1087,fd=14))
users:(("java",pid=919,fd=13))
users:(("java",pid=919,fd=71))
```

```
ss -tlpn
```

Access the web interface with ip address and port. Please discuss with firewall team to allow access.

## Rollback

```
Just comment out the config inside setenv.sh or completely remove it.
systemctl restart tomcat
afterward.
```

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