Java JVM and Heap Size Settings with Apache Tomcat

AN ACTIVE ENDPOINTS TECHNICAL NOTE

2010

Content

Introduction

This technical note describes how to configure Java Virtual Machines settings for Apache Tomcat ensuring that sufficient memory is allocated for ActiveVOS to function.

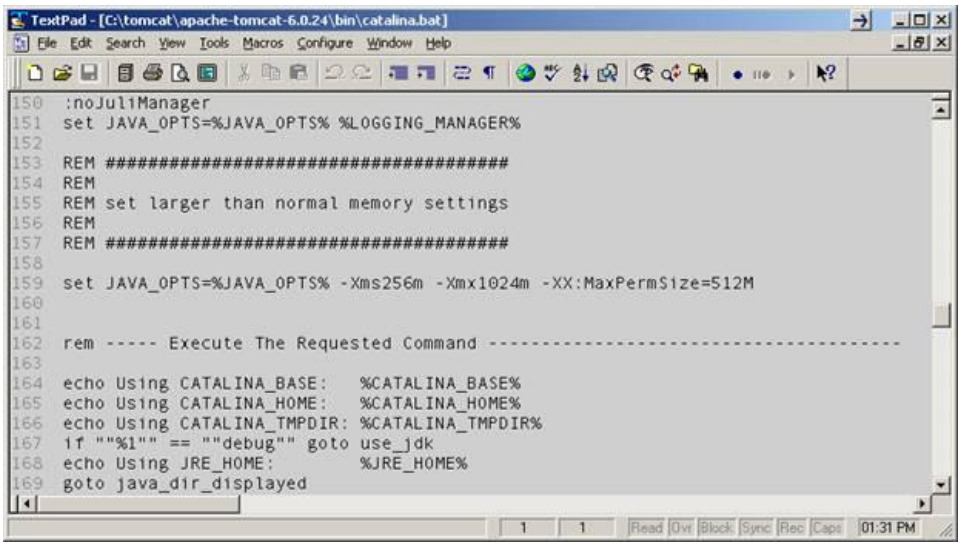
Configuring Apache Tomcat Memory Allocation

As described in the ActiveVOS Server Prerequisites installation guide, we recommend that you run your application server with the following memory settings:

```
-Xms256m -Xmx1024m -XX:MaxPermSize=512M
```

where Xms is starting memory, Xmx is maximum memory, and MaxPermSize refers to the amount of memory set aside for loading class files.

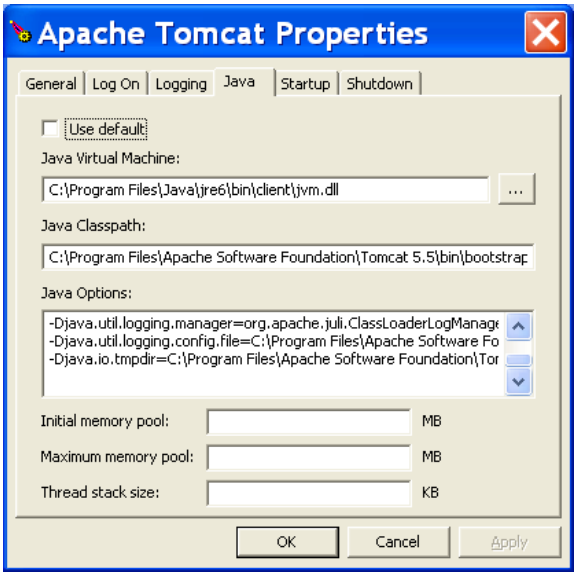
If you are using Apache Tomcat, you can add these settings to your Catalina.bat file if running Microsoft Windows:



If running Apache Tomcat (5.5 in this case) as a Microsoft Windows service, you can update JVM settings in the following manner:

1. Stop Tomcat using services
2. Navigate to C:\Program Files\Apache Software Foundation\Tomcat 5.5\bin directory and double click tomcat5w.exe.

You should see the following screen:



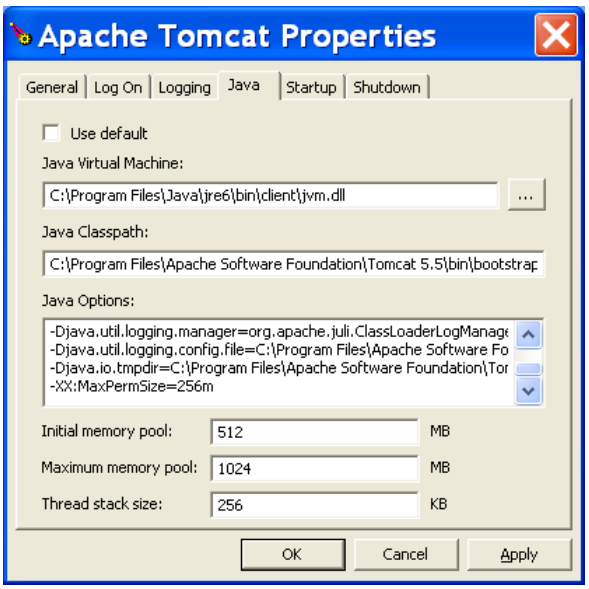
3. Click on the Java tab. Under Java Options, add the following line

```
-XX:MaxPermSize=256m
```

Also enter the following values:

- Initial memory pool: 512
- Maximum memory pool: 1024
- Thread Stack size: 256

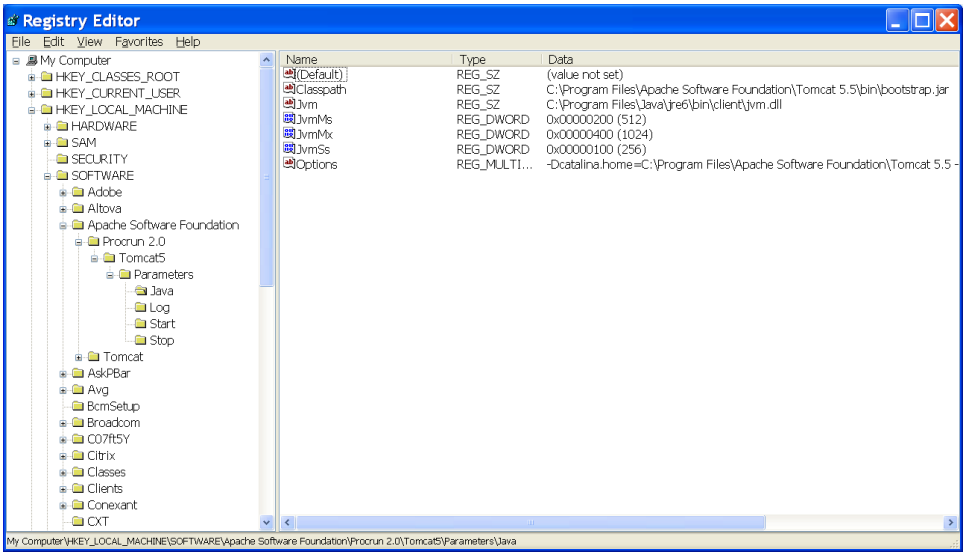
It is shown here:



Click Apply. Click OK.

4. Start Tomcat using services.

   Note that when JVM settings are updated as described above, the Windows Registry values are also updated as shown here:



Example of Use

You will encounter errors if insufficient memory resources are allocated to run ActiveVOS. We provide an example here using ActiveVOS 8 on Tomcat 6 and Mysql 5.1.

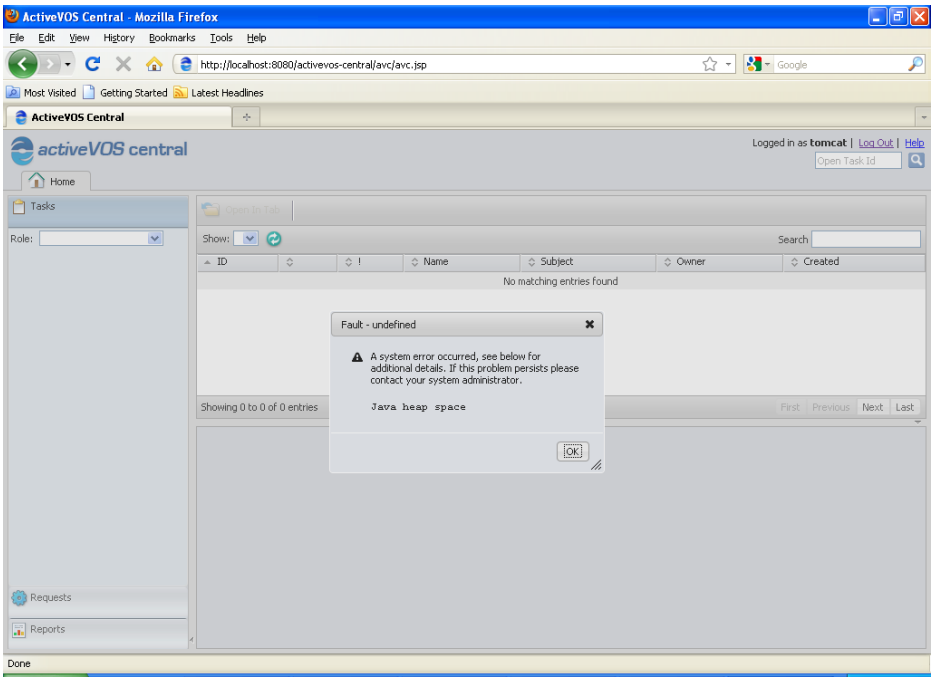
Symptoms

1. We installed Tomcat 6 as a Windows service using:

   ```
   C:\apache-tomcat-6.0.20\bin>service.bat install
   ```

2. We then installed ActiveVOS 8 on Tomcat 6.0.20 and MySql 5.1.

3. After starting the ActiveVOS Server, we encountered the following errors while trying to login to ActiveVOS Central:



The Apache Tomcat logs reported the following errors:

```
INFO: Server startup in 51993 ms

Oct 25, 2010 2:02:17 PM org.activebpel.rt.AeException logWarning

WARNING: WS-Security features will not be available. Error
instantiating crypto provider.  Please check that
crypto.properties and your keystore are accessible on the
classpath

Oct 25, 2010 2:02:17 PM org.activebpel.rt.AeException logWarning

WARNING: WS-Security features will not be available. Error
instantiating crypto provider.  Please check that
crypto.properties and your keystore are accessible on the
classpath

Oct 25, 2010 2:02:28 PM org.activebpel.rt.AeException logError

SEVERE: Exception during execution of bpel object for process 5.

java.lang.OutOfMemoryError: Java heap space

        at
org.activebpel.rt.bpel.server.engine.storage.sql.AeDbUtils.getStri
ng(AeDbUtils.java:236)

        at …
```

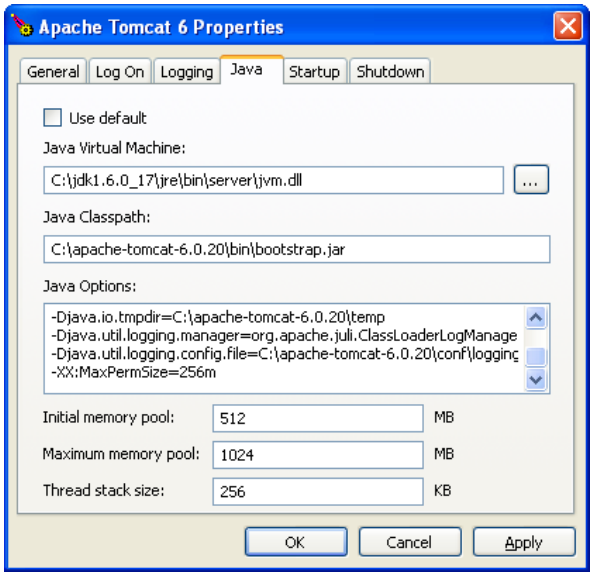
This indicated the need to configure JVM memory settings.

Also, in some cases, updating Java JVM values has been found to resolve Tomcat start up errors such as an **OutOfMemoryError: permGen space** error.

Resolution

1. We then shutdown Apache Tomcat.

2. We executed tomcat6w.exe, selected the Java tab and configured the JVM settings as described in the previous section



   Click Apply. Click OK.

3. We started Apache Tomcat as a service, and were able to login to ActiveVOS Central without encountering Java heap size errors being reported in the logs.

Tuning ActiveVOS

The ActiveVOS Performance Tuning Technical Note at http://www.activevos.com/developers-documentation.php#Planning describes how by tuning ActiveVOS and allocating a greater amount of resources available (such as memory) higher throughput can be achieved for example on a single node (95.56 TPS vs 200 TPS). Clustering will also drive performance up.

About Active Endpoints

Active Endpoints (www.activevos.com) ActiveVOS is the leader in service-oriented BPM software for process automation. ActiveVOS empowers project teams to create business process management (BPM) applications using services, making their businesses more agile and effective. ActiveVOS promotes mass adoption of SOA-enabled BPM applications by focusing on accelerating project delivery time with a complete, affordable and easy-to-use system. Active Endpoints is headquartered in Waltham, MA with development facilities in Shelton, CT.

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