

C212/A592 Lab 11

Intro to Software Systems

Instructions:

- Review the requirements given below and Complete your work. Please submit link of your site through Canvas.
- The grading scheme is provided on Canvas

Lab11: Installing Apache Tomcat, Java Servlets

Follow these steps:

1. A list of FAQs is given at the end of this document.
2. Log into burrow. Use puTTY and access **burrow.soic.indiana.edu** to login. For more information visit <https://uisapp2.iu.edu/confluence-prd/pages/viewpage.action?pageId=114491559>

If you are not familiar with using remote login shells or file transfer, visit

<https://uisapp2.iu.edu/confluence-prd/display/SOICKB/SSH+Remote+Logins+and+File+Transfer+to+Linux+Servers>

If you are not familiar with Linux, here is a list of basic commands

http://www.comptechdoc.org/os/linux/usersguide/linux_ugbasics.html

3. Create **c212-workspace** folder and move there.

```
[aabhutta@sil0 ~]$ pwd
/u/aabhutta
[aabhutta@sil0 ~]$ mkdir c212-workspace
[aabhutta@sil0 ~]$ cd c212-workspace/
[aabhutta@sil0 c212-workspace]$
```

4. Bring the archive, uncompress and unarchive it.

```
[aabhutta@sil0 c212-workspace]$ cp /l/www/classes/a348/spr2013/software/apache-tomcat-7.0.35.tar.gz .
```

```
[aabhutta@sil0 c212-workspace]$ gunzip apache-tomcat-7.0.35.tar.gz
[aabhutta@sil0 c212-workspace]$ tar xf apache-tomcat-7.0.35.tar
[aabhutta@sil0 c212-workspace]$
```

5. Move into the newly created folder.

```
[aabhutta@sil0 c212-workspace]$ cd apache-tomcat-7.0.35/
```

6. Move into **conf**, set up server.xml (put your own **port numbers** in it. You can find your Port numbers on canvas).

```
[aabhutta@silo apache-tomcat-7.0.35]$ cd conf
[aabhutta@silo conf]$ mv server.xml server.xml-distr
[aabhutta@silo conf]$ nano -w server.xml
```

The contents of server.xml file are shown below:

```
-bash-4.2$ cat server.xml
```

```
<Server port="24100" shutdown="SHUTDOWN">

  <GlobalNamingResources>
    <!-- Used by Manager webapp -->
    <Resource name="UserDatabase" auth="Container"
      type="org.apache.catalina.UserDatabase"
      description="User database that can be updated and saved"
      factory="org.apache.catalina.users.MemoryUserDatabaseFactory"
      pathname="conf/tomcat-users.xml" />
  </GlobalNamingResources>

  <Service name="Catalina">
    <Connector port="24099" />

    <Engine name="Catalina" defaultHost="localhost">
      <Realm className="org.apache.catalina.realm.UserDatabaseRealm"
        resourceName="UserDatabase" />
      <Host name="localhost" appBase="webapps" />
    </Engine>

  </Service>
</Server>
```

```
-bash-4.2$
```

7. Also define yourself as manager in tomcat-users.xml.

Here's what my file looks like:

```
[aabhutta@silo conf]$ pwd
/u/aabhutta/c212-workspace/apache-tomcat-7.0.35/conf
[aabhutta@silo conf]$ ls -ld tomcat-users.xml
-rw----- 1 aabhutta students 160 Oct 28 13:09 tomcat-users.xml
[aabhutta@silo conf]$ nano -w tomcat-users.xml
```

The contents of **tomcat-users.xml** file are shown below:

```
[aabhutta@sil0 conf]$ cat tomcat-users.xml
```

```
<?xml version='1.0' encoding='utf-8'?>
<tomcat-users>
  <role rolename="manager-gui"/>
  <user username="test" password="p3n9uin" roles="manager-gui"/>
</tomcat-users>
```

```
[aabhutta@sil0 conf]$
```

I have basically removed all comments and added just what was needed.

8. Go up one folder and create **.tomcat-settings** as in class.

```
[aabhutta@sil0 conf]$ cd ..
[aabhutta@sil0 apache-tomcat-7.0.35]$ nano -w .tomcat-settings
[aabhutta@sil0 apache-tomcat-7.0.35]$ echo $JAVA_HOME

[aabhutta@sil0 apache-tomcat-7.0.35]$ source .tomcat-settings
[aabhutta@sil0 apache-tomcat-7.0.35]$ echo $JAVA_HOME
/usr/lib/jvm/java-1.7.0
[aabhutta@sil0 apache-tomcat-7.0.35]$ cat .tomcat-settings
```

```
-bash-4.2$ cat .tomcat-settings
JAVA_HOME=/usr/lib/jvm/java-1.7.0
export JAVA_HOME

CATALINA_HOME=/u/aabhutta/c212-workspace/apache-tomcat-7.0.35
export CATALINA_HOME

CLASSPATH=.:$CATALINA_HOME/lib/servlet-api.jar
export CLASSPATH
```

Run `source .tomcat-settings` and check `$JAVA_HOME`, `$CATALINA_HOME` as done above. (Don't forget to use your own **username**).

9. Now start the server.

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

10. Change your home page, add name, picture, link to old page.

```
[aabhutta@sil0 apache-tomcat-7.0.35]$ pwd
/u/aabhutta/c212-workspace/apache-tomcat-7.0.35
[aabhutta@sil0 apache-tomcat-7.0.35]$ cd $CATALINA_HOME/webapps/ROOT
[aabhutta@sil0 ROOT]$ nano -w index.html
```

My name is Adeel and I like fish! <p>

11. Set up cricket context: one.html, web.xml, One.java Here's the map for this step:

12. Follow the map above, compile the servlet:

Be sure to be in classes folder when you issue this command.

Frequently Asked Questions (or Common Errors)

Possible Remedy: This happens because the classpath was not setup properly. Run the echo command in step 7 to see if it was setup properly. If it does not print anything then redo step 7. i.e., Run the command "`$CATALINA_HOME/bin/shutdown.sh`" and do step 8.

Symptom/Error: Server compiles, but when we try to access the page it doesn't load

Possible Remedy: There are two possible errors: (1) Try to see if multiple server processes are running (see instructions below). Kill the process either way. (2) Run the command "netstat -antu | grep <your-port-number>" to check and see if the port number is being used by someone else. If that's the case, you a port number (after the range of numbers we used for the class). Pick any two, check to make sure they are not being used and update server.xml step 5. Check to see if the class path is setup correctly (Step 7). Check the html files to see if they have all opening and closing tags. Start the server.

Symptom/Error: Step 3 (copying apache-tomcat.tar.gz) simply doesn't work

Possible Remedy: exit the shell program and log back in. Try the command:

```
cp /l/www/classes/a348/spr2013/software/apache-tomcat-7.0.35.tar.gz apache-tomcat-7.0.35.tar.gz
```

Note: burrow/silo may clear the class paths when you logout and login so check step 7 to make sure that it works when you log back in.

Symptom/Error: Page doesn't load. How to see if multiple server processes are running?

Possible Remedy: If you have trouble getting your server to work, one possible problem could be that you may be running multiple instances of tomcat server. If that is the case, kill all instances and start the new one again.

To check the current tasks, do this:

```
[aabhutta@silo apache-tomcat-7.0.35]$ ps -ef | grep tomcat aabhutta
```

```
[aabhutta@silo ~]$ ps -ef | grep aabhutta
root    44370 144698  0 21:38 ?        00:00:00 sshd: aabhutta [priv]
aabhutta 44467 44370  0 21:38 ?        00:00:00 sshd: aabhutta@pts/36
aabhutta 44476 44467  0 21:38 pts/36   00:00:00 -bash
aabhutta 45476 44476  0 21:41 pts/36   00:00:00 ps -ef
aabhutta 45477 44476  0 21:41 pts/36   00:00:00 grep --color=auto aabhutta
aabhutta 95518 1 0 Nov08 ?        00:02:52 /usr/lib/jvm/java-1.7.0/bin/java -
Djava.util.logging.config.file=/u/aabhutta/c212-workspace/apache-tomcat-
7.0.35/conf/logging.properties -
Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -
Djava.endorsed.dirs=/u/aabhutta/c212-workspace/apache-tomcat-7.0.35/endorsed -classpath
/u/aabhutta/c212-workspace/apache-tomcat-7.0.35/bin/bootstrap.jar:/u/aabhutta/c212-
workspace/apache-tomcat-7.0.35/bin/tomcat-juli.jar -Dcatalina.base=/u/aabhutta/c212-
workspace/apache-tomcat-7.0.35 -Dcatalina.home=/u/aabhutta/c212-workspace/apache-
tomcat-7.0.35 -Djava.io.tmpdir=/u/aabhutta/c212-workspace/apache-tomcat-7.0.35/temp
org.apache.catalina.startup.Bootstrap start
```

This should show all of the running tasks (with username and task ID). If you see multiple instances of tomcat, kill them one by one using the ID. See example below:

```
[aabhutta@silo ~]$ kill 95518
[aabhutta@silo ~]$ ps -ef | grep aabhutta
root    44370 144698  0 21:38 ?        00:00:00 sshd: aabhutta [priv]
aabhutta 44467 44370  0 21:38 ?        00:00:00 sshd: aabhutta@pts/36
aabhutta 44476 44467  0 21:38 pts/36   00:00:00 -bash
aabhutta 49363 44476  0 21:46 pts/36   00:00:00 ps -ef
aabhutta 49364 44476  0 21:46 pts/36   00:00:00 grep --color=auto aabhutta
```

Now restart the server.