Jenkins – Continuous Deployment

Jenkins Continuous Deployment

- This session we will see how to deploy a web app to Tomcat server after the build
- Pre-requisites
  - Apache Tomcat 8.5 is installed
  - Configure Tomcat 8.5 to listen to port 8081 or any other port to avoid port conflict with Jenkins
  - Note that this is done only in training sessions
  - In production, Jenkins and Tomcat are deployed on separate machines

Tomcat Configuration – change port

- Under Tomcat Installation Directory, Navigate to '***Conf***' directory and open '***Server.xml***' file
- Better to use and editor like ***notepad++***
- Edit the file and change the port number from 8080 to 8081
- Then restart Tomcat service
- Open a browser and type http://localhost:8081 you should see Tomcat initial page

```
        Java AJP  Connector: /docs/config/ajp.html
        APR (HTTP/AJP) Connector: /docs/apr.html
        Define a non-SSL/TLS HTTP/1.1 Connector on port 8080
    -->
    <Connector port="8081" protocol="HTTP/1.1"
               connectionTimeout="20000"
               redirectPort="8443" />
    <!-- A "Connector" using the shared thread pool-->
    <!--
    <Connector executor="tomcatThreadPool"
               port="8080" protocol="HTTP/1.1"
               connectionTimeout="20000"
```

Tomcat – User Configuration

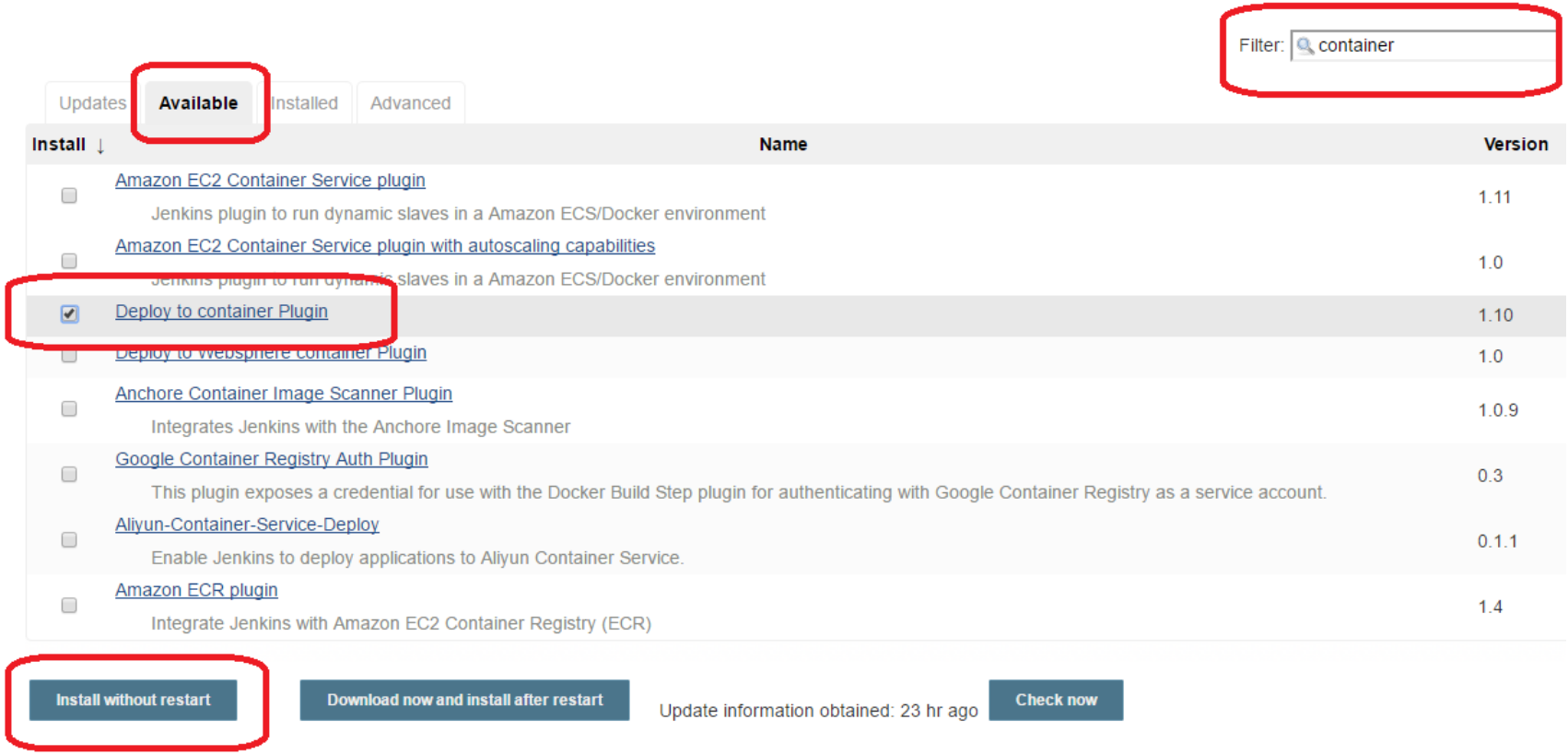
- We need to add a Tomcat User who's credentials will be used by Jenkins to deploy the build
- Navigate to Tomcat Installation Directory → Conf
- Edit ***tomcat-users.xml***
- Make an entry for user with role as ***manager-script***

```
    <user username="deployer" password="deployer" roles="manager-script" />

</tomcat-users>
```

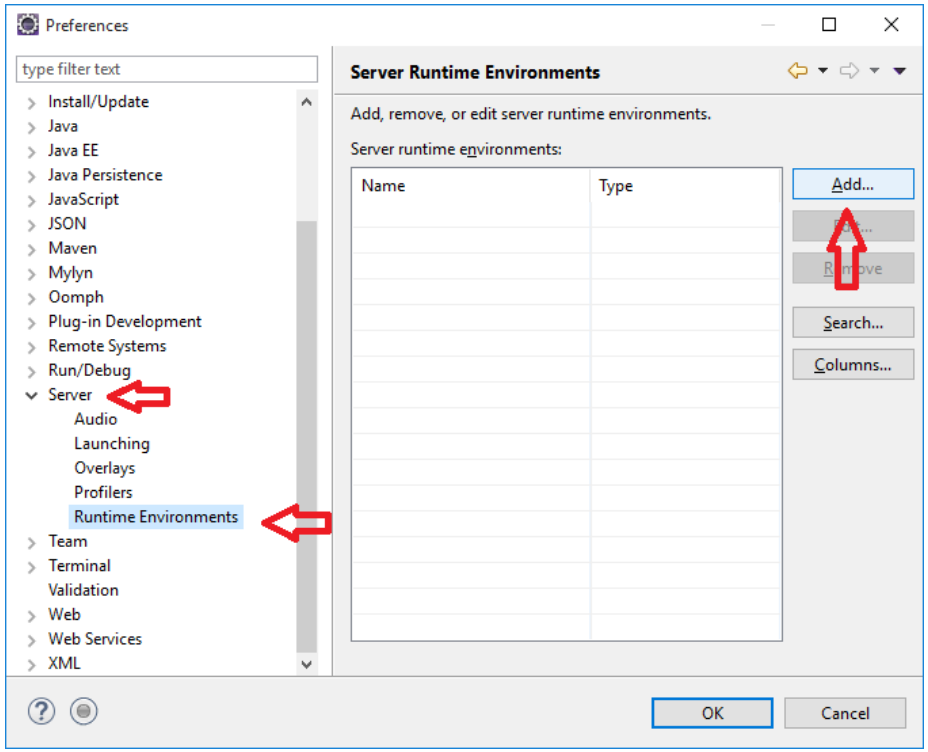
Jenkins – add Deployment Plugin

- Go to Manage Jenkins → Manage Plugins
- Select the “Available” tab, locate the “Deploy to container” plugin and install it.



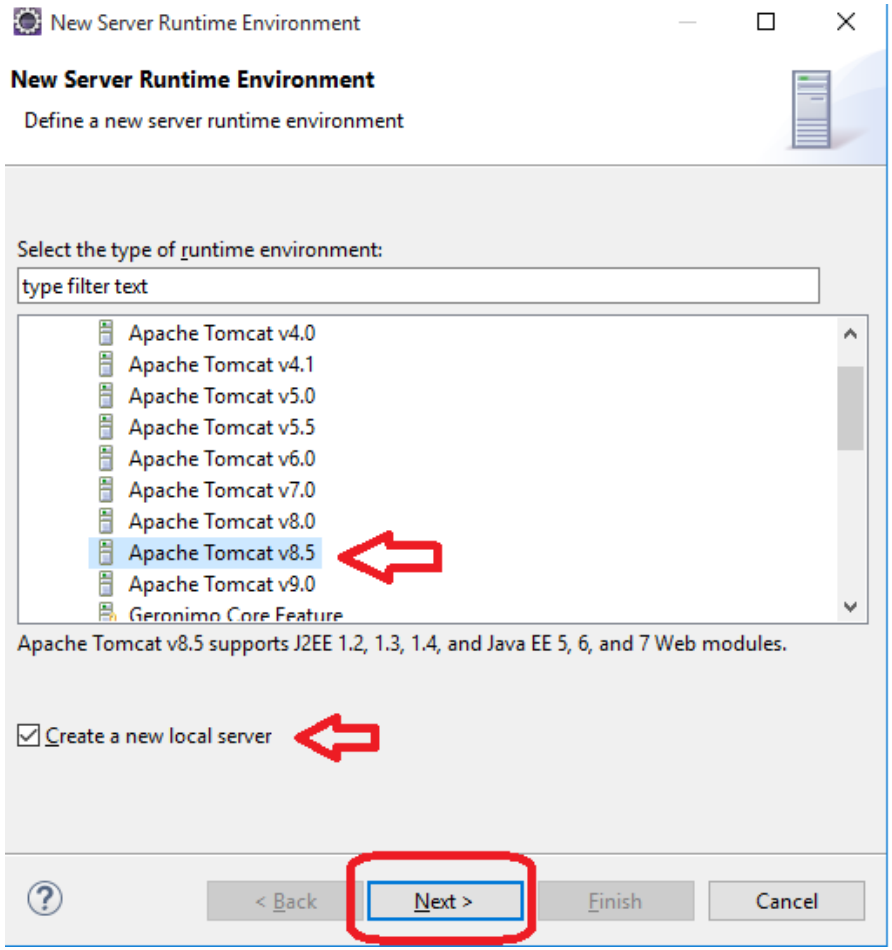
Create a Web App in Eclipse

- Firstly, even before creating a web app in Eclipse, lets create a local Tomcat Server configuration
- In Eclipse, go to *Window* → *Preferences*
- Expand *Server* → Click *on Runtime Environment*
- Click on *Add* button



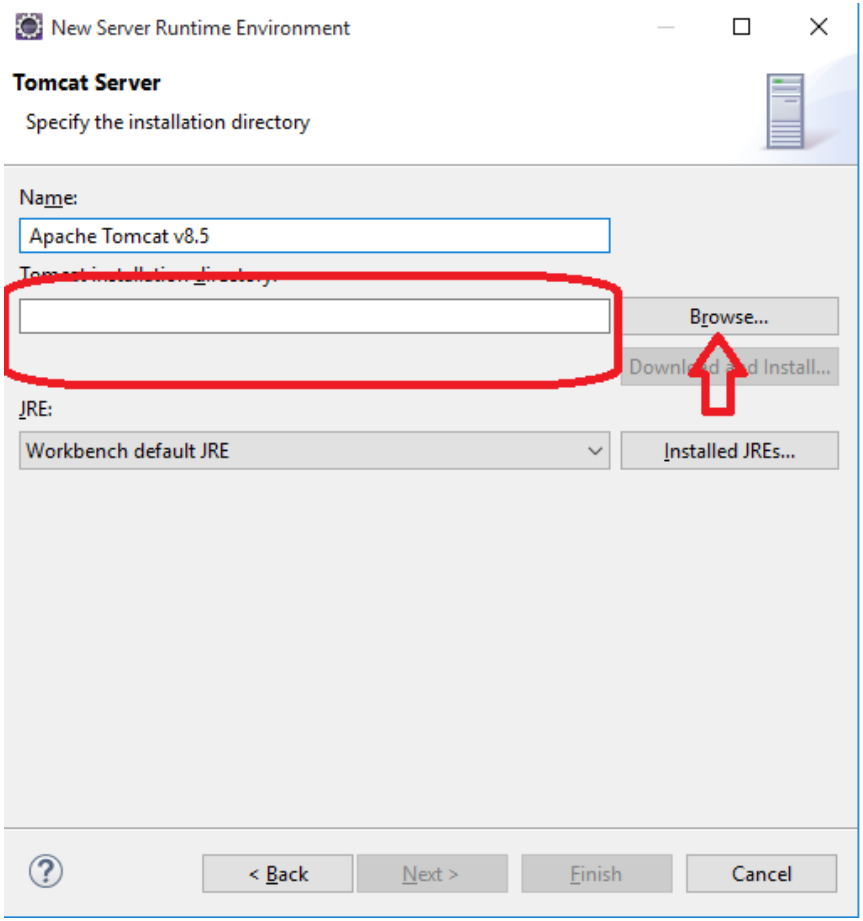
Create a Web App in Eclipse contd

- Select Apache Tomcat 8.5
- Check on *'Create Local Server'*
- Click *Next*



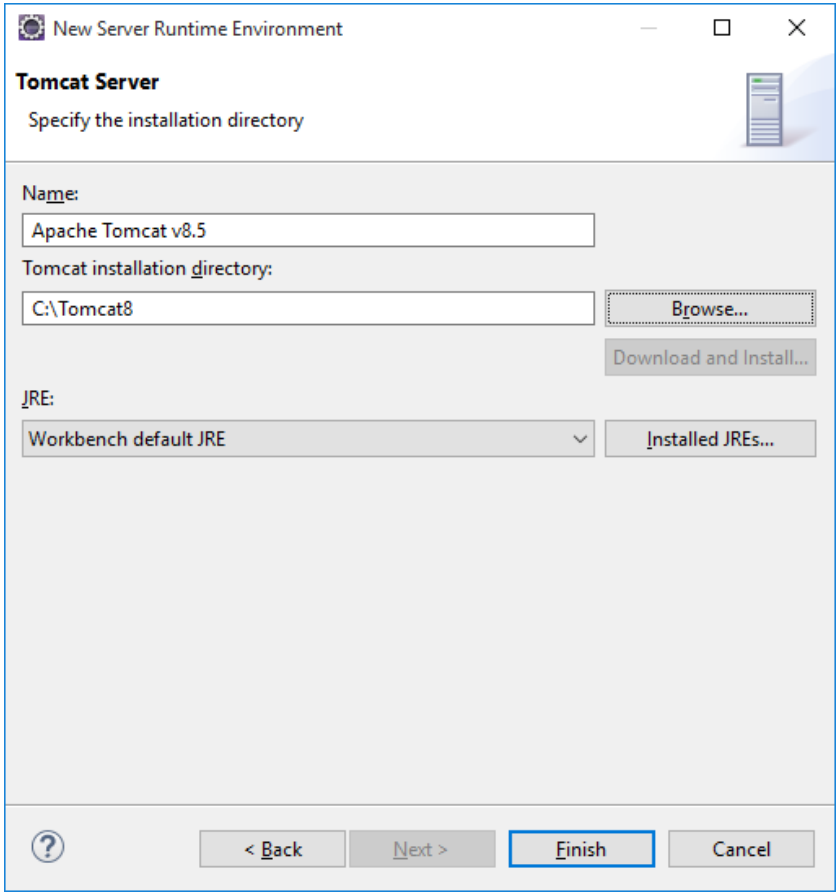
Create a Web App in Eclipse contd

- Use *Browse* button and navigate to *Tomcat Installation Directory*



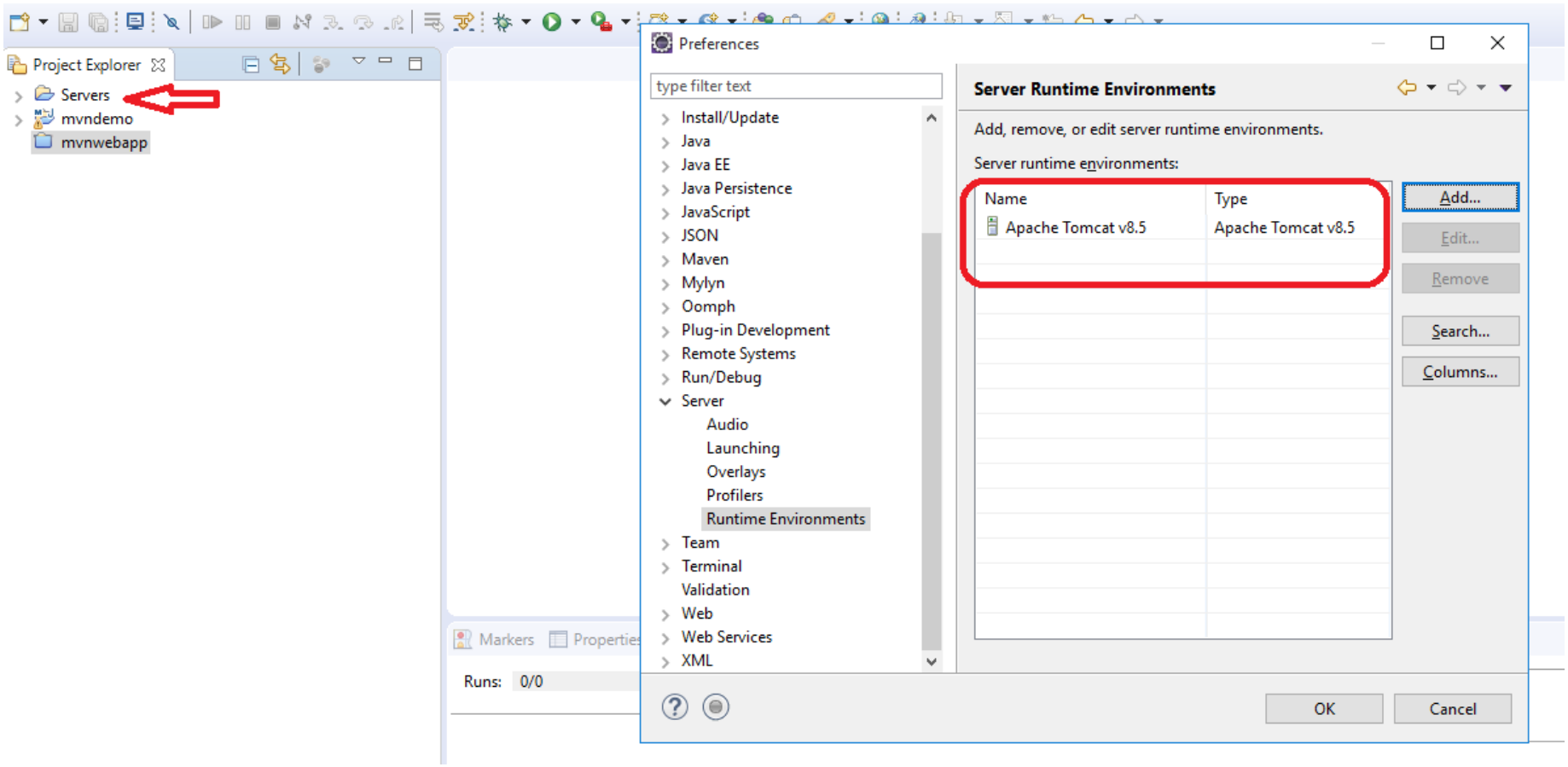
Create a Web App in Eclipse contd

- Click Finish after selecting the Tomcat Installation Directory



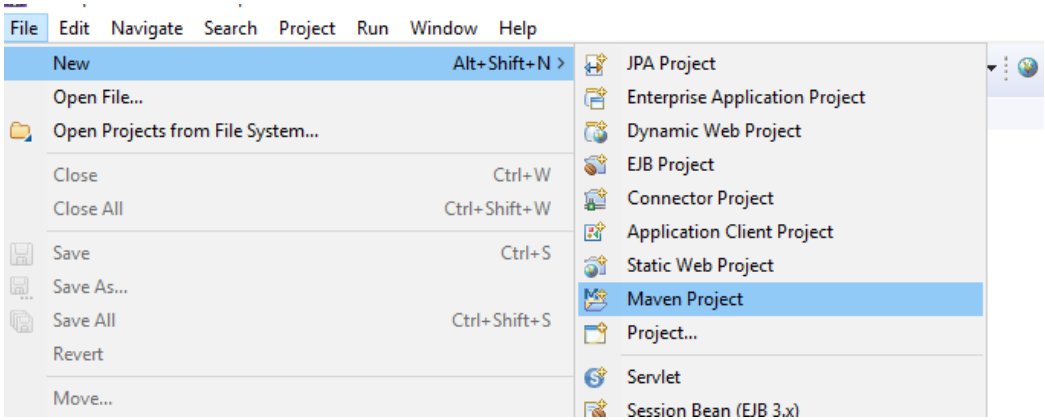
Create a Web App in Eclipse contd

- You can see that *Local Server Run Time Environment* is created from within Eclipse

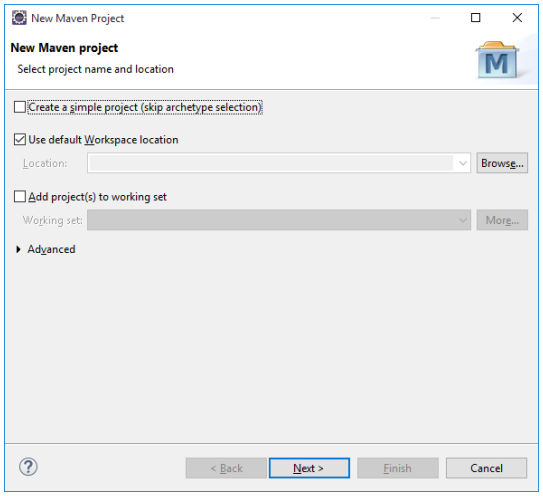


Create a Web App in Eclipse

- Go to File → New → Maven Project

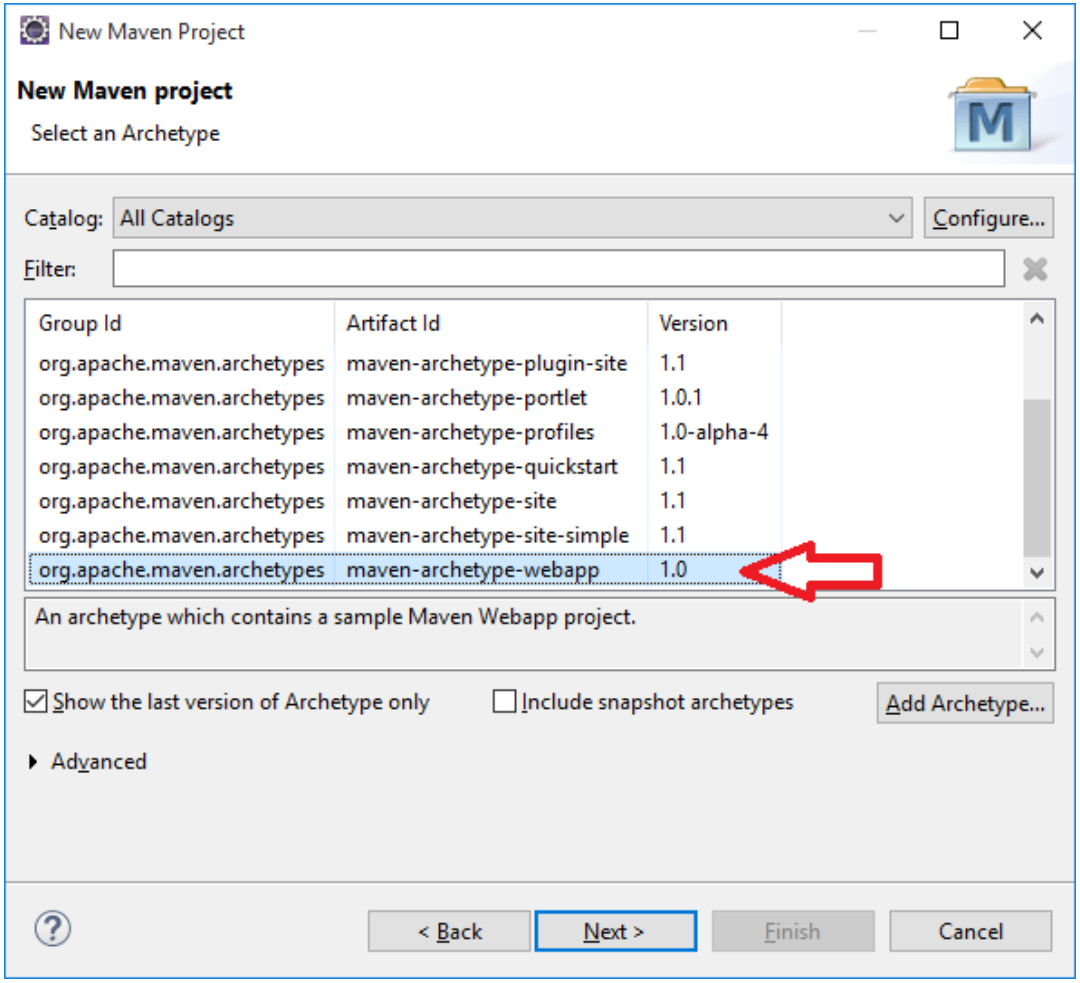


- Use default work space location and click ***Next***



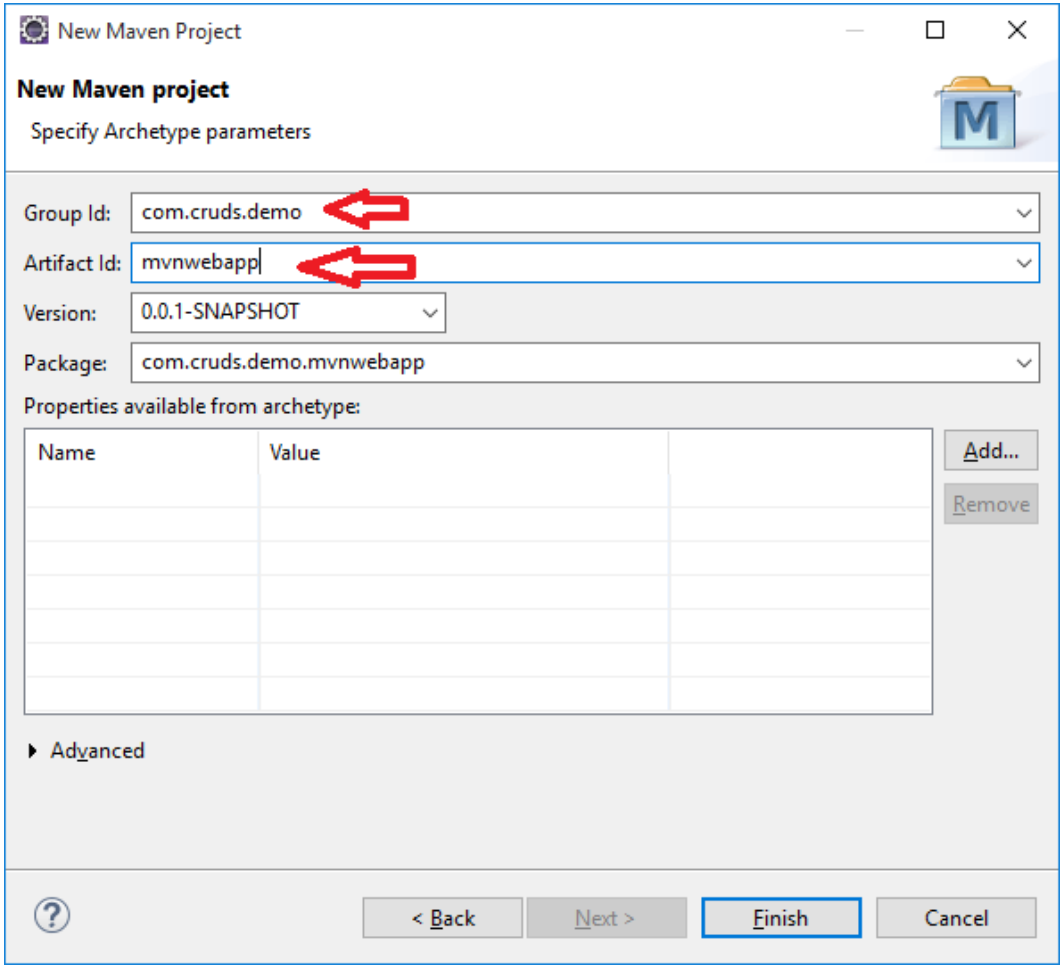
Create a Web App in Eclipse contd..

- Scroll down and select ***maven-archetype-webapp***
- And click next



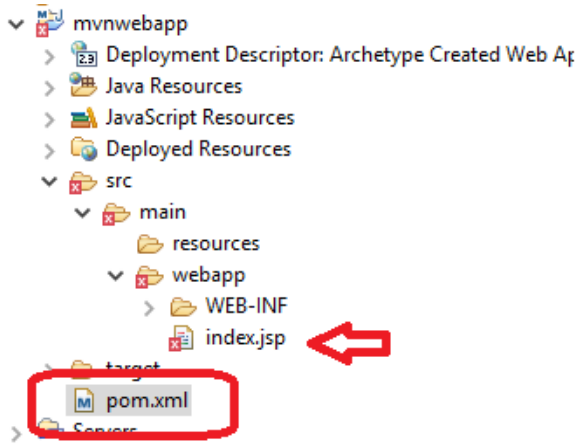
Create a Web App in Eclipse contd..

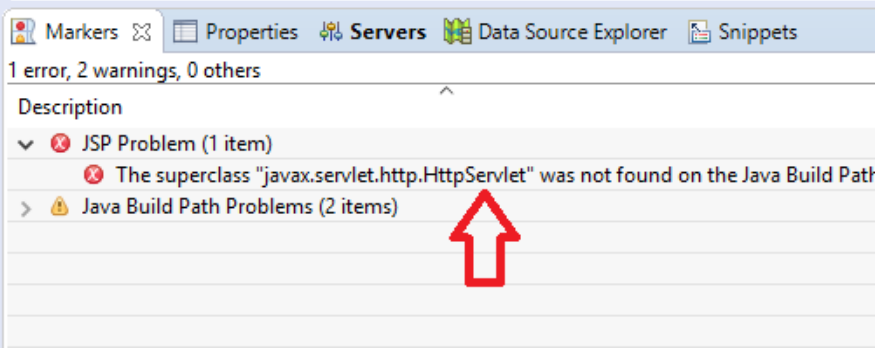
- Provide a Group Id and Artifact Id
- And Finish



Create a Web App in Eclipse contd..

- If you get a compilation error, saying HttpServlet is not on classpath
- Open pom.xml





Create a Web App in Eclipse contd..

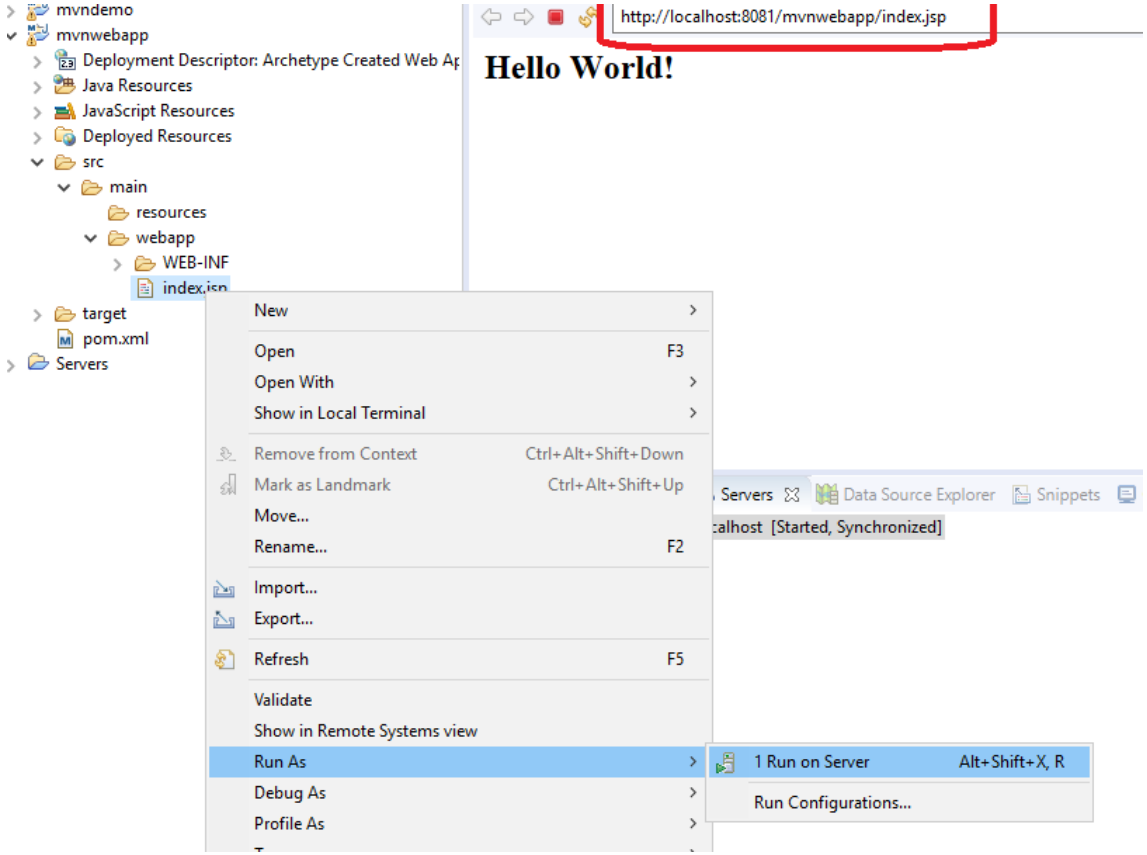
- Add dependency in *pom.xml* for Servlet API and Save

```
<dependency>
    <groupId>javax.servlet</groupId>
    <artifactId>javax.servlet-api</artifactId>
    <version>3.0.1</version>
</dependency>
```

```
10  <dependencies>
11    <dependency>
12      <groupId>junit</groupId>
13      <artifactId>junit</artifactId>
14      <version>3.8.1</version>
15      <scope>test</scope>
16    </dependency>
17
18    <!-- https://mvnrepository.com/artifact/javax.servlet/javax.servlet-api -->
19    <dependency>
20        <groupId>javax.servlet</groupId>
21        <artifactId>javax.servlet-api</artifactId>
22        <version>3.0.1</version>
23    </dependency>
24
25  </dependencies>
```

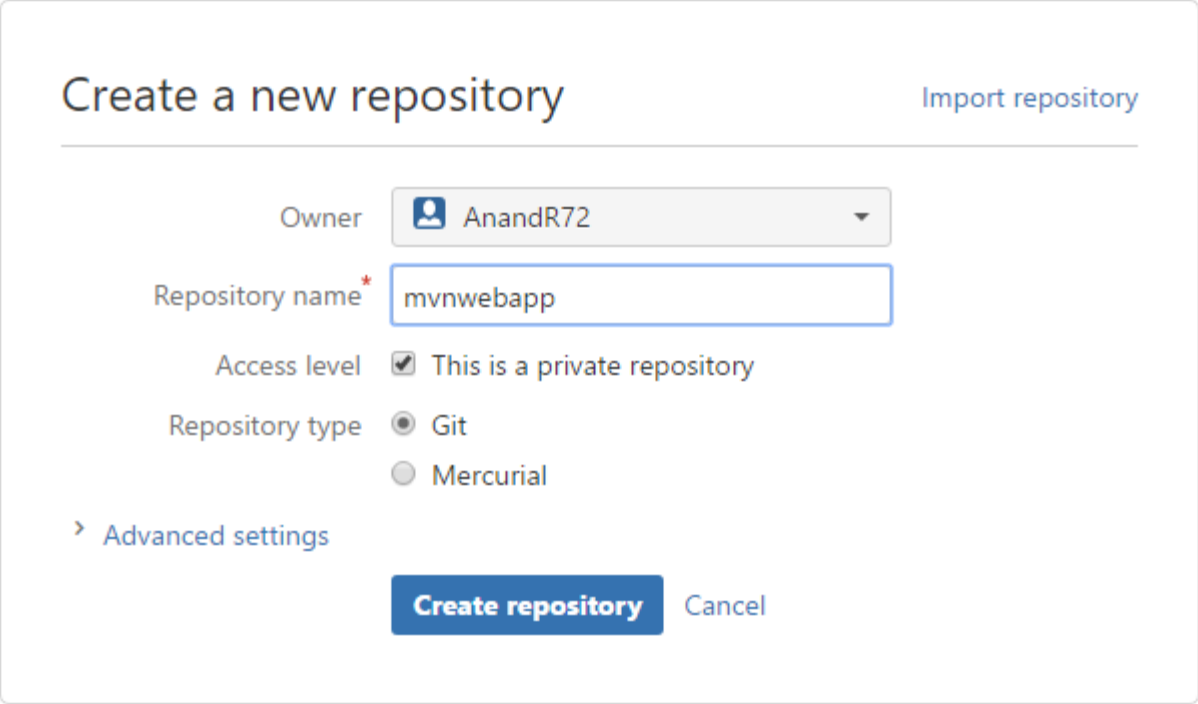
Test Locally

- Go to Services console and make sure the external tomcat is not running.
- You can see the *index.jsp* displayed in Eclipse internal browser
- So the web app is working fine!



Push the code to Git Repository

- On Bitbucket lets create a new Repository and call it ***mvnwebapp***



Push the code to Git Repository contd..

- Open git bash terminal
- $ cd workspace/mvnwebapp/
- $ git init
- $ touch .gitignore
- $ vim .gitignore

Add the following lines to .gitignore file

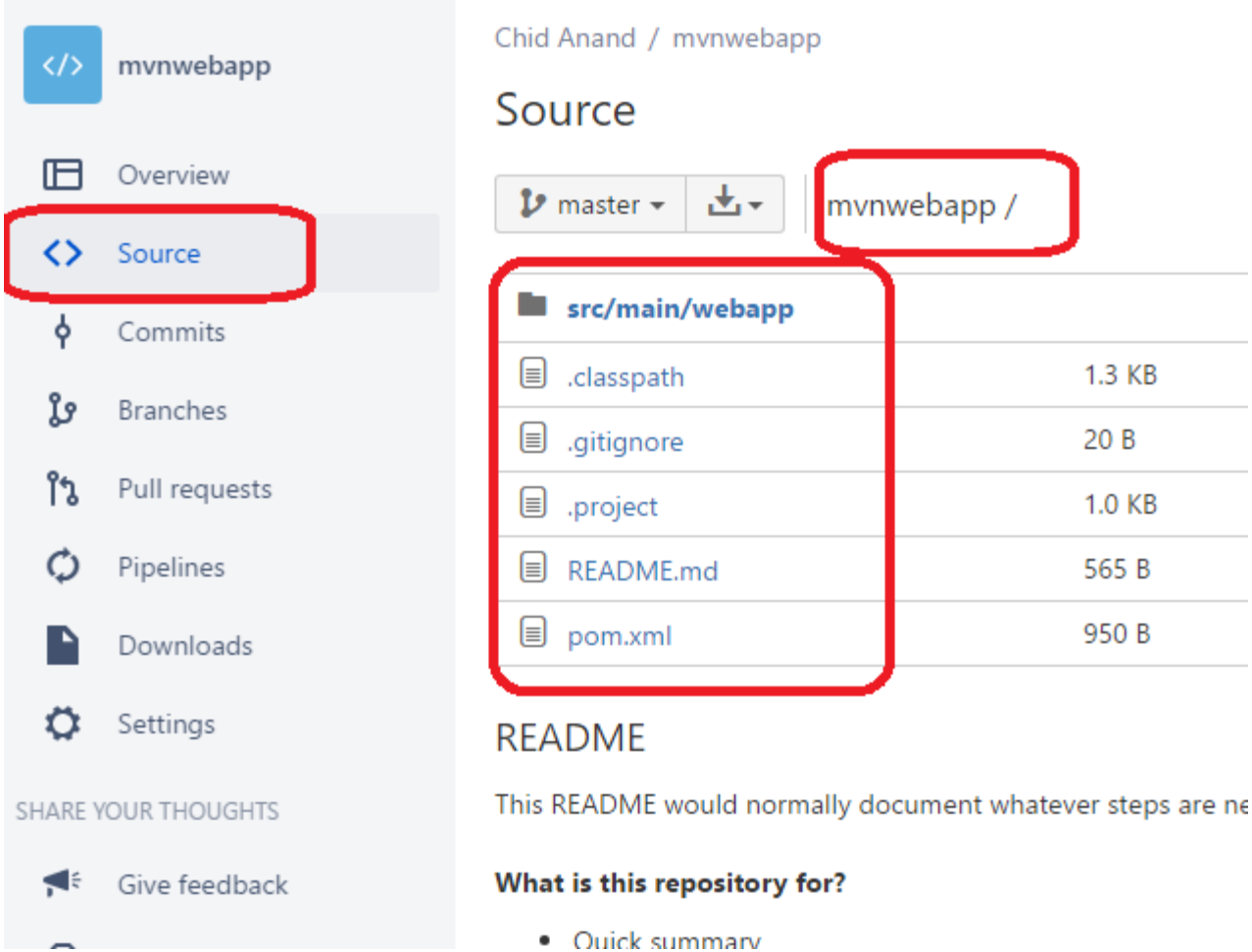
.settings/

target/

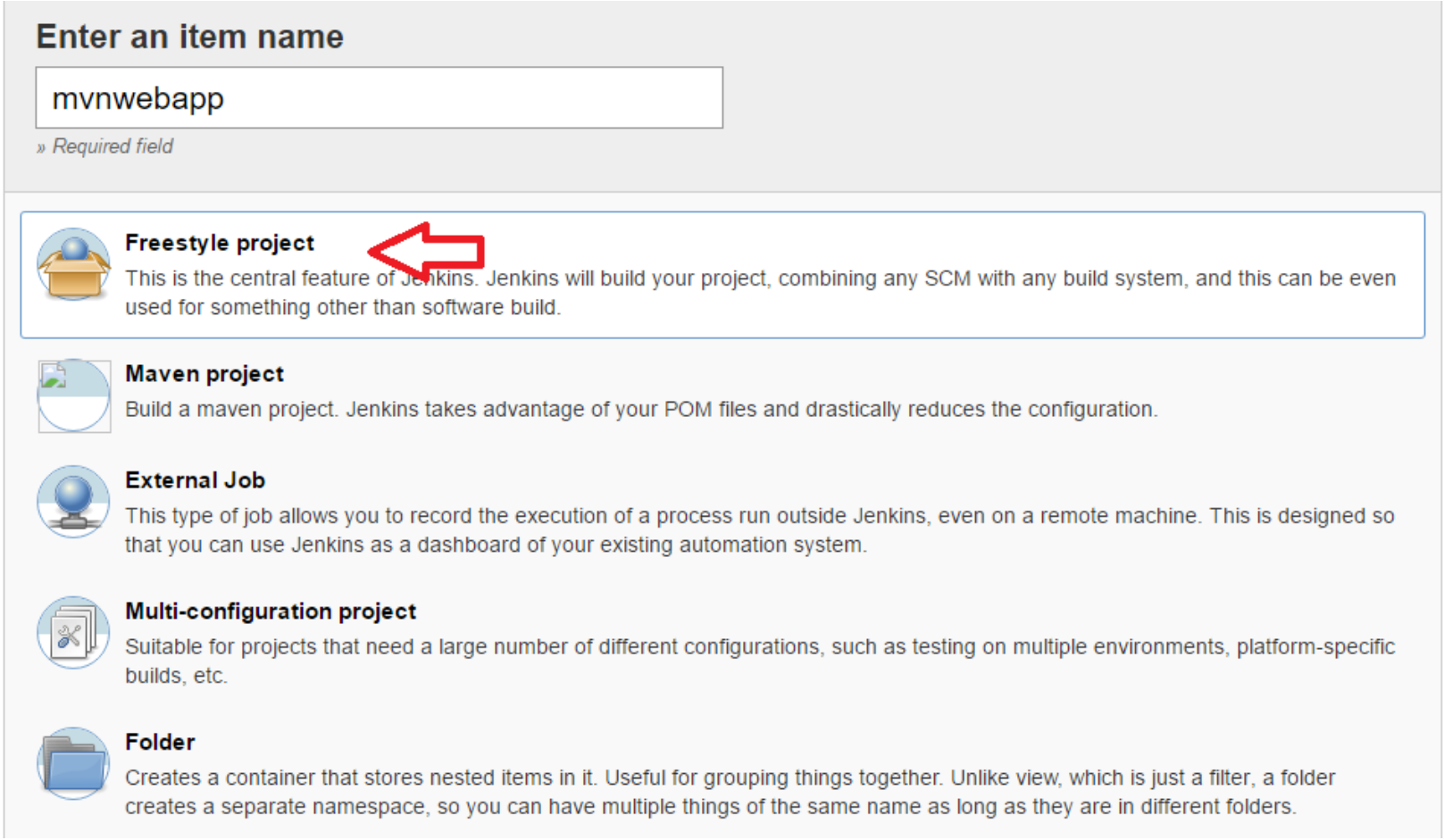
- $ git status
- $ git add .
- $ git remote add origin https://AnandR72@bitbucket.org/AnandR72/mvnwebapp.git
- $ git pull origin master

Push the code to Git Repository contd..

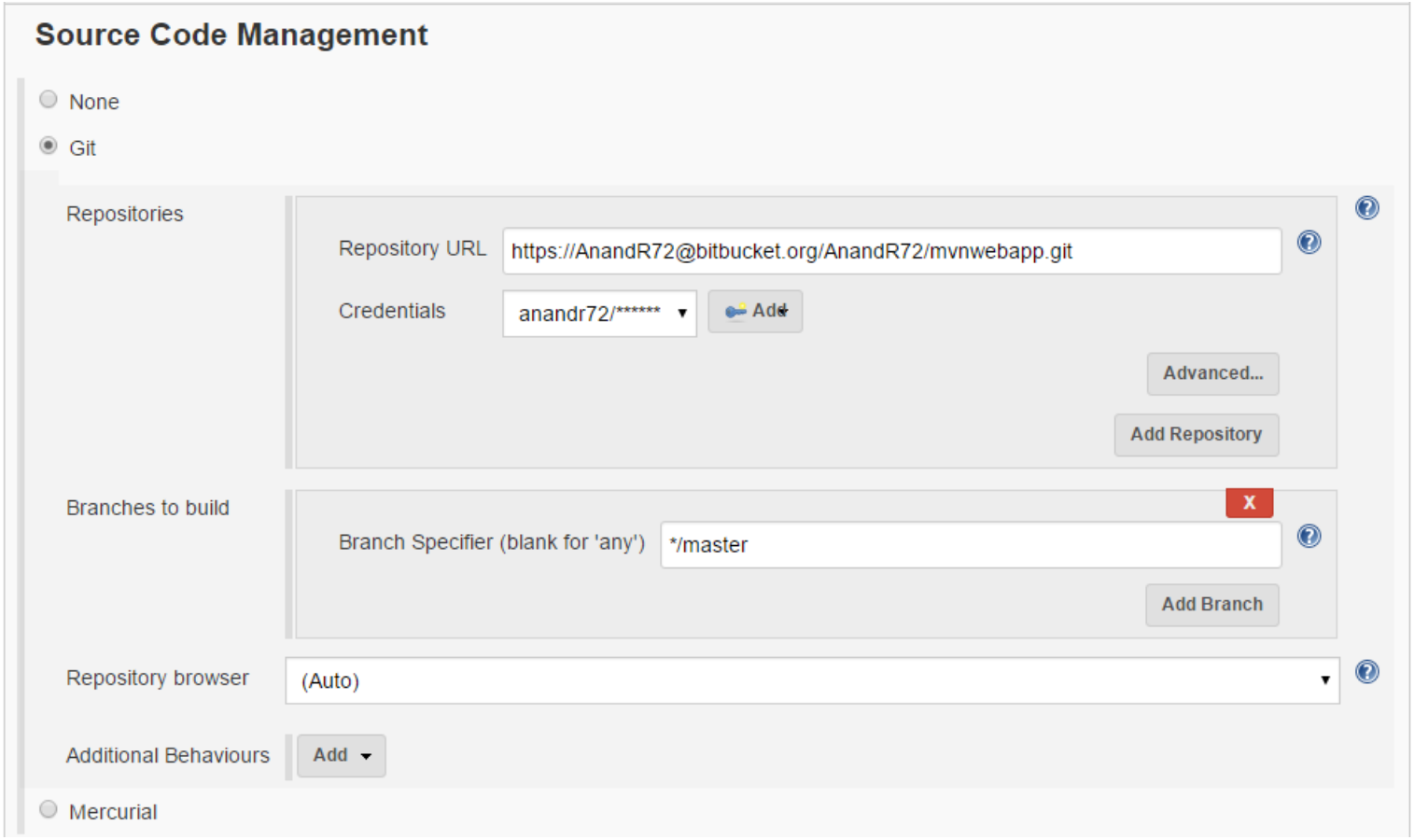
- $ git commit -m'initial'
- $ git push origin master
- You can check the repo on bitbucket to see the code



Jenkins – create a build job

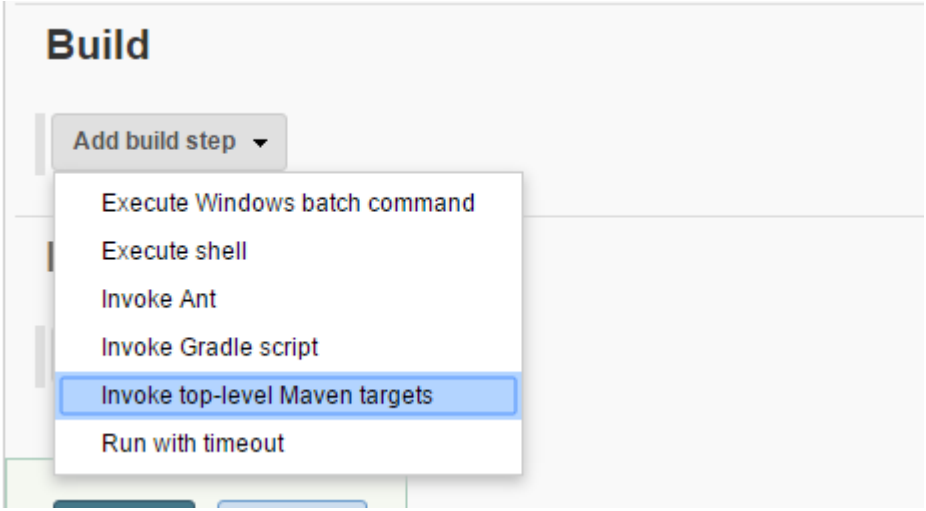


Jenkins – create a build job contd..



Jenkins – create a build job contd..

- Add Build Step, and run the build to check



Jenkins – view output

- You can see that build was successful

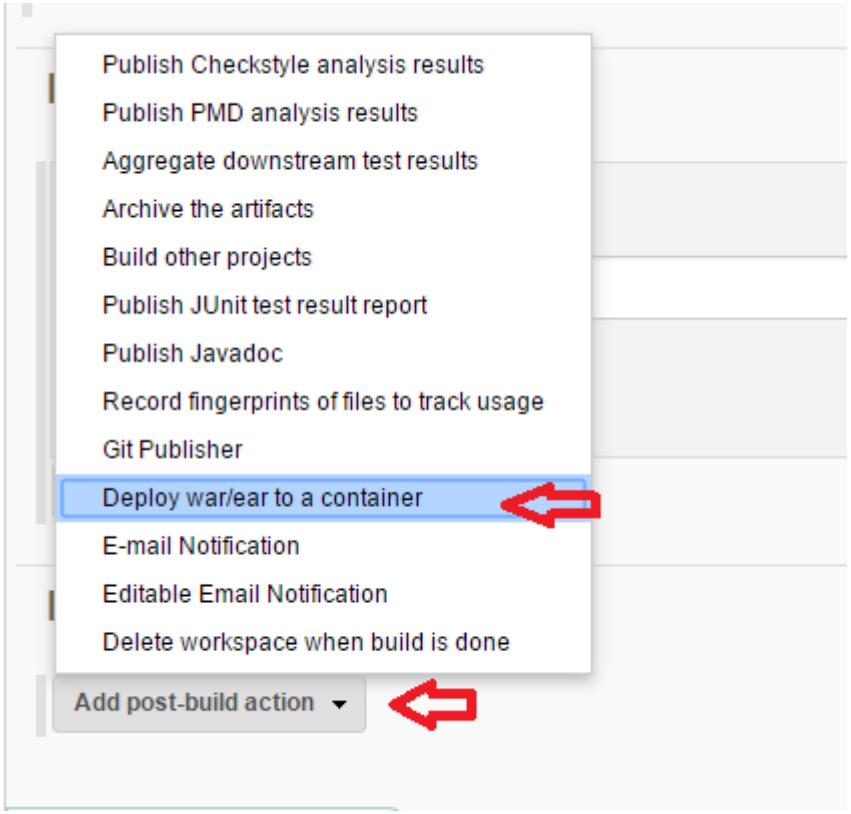
```
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ mvnwebapp ---
[INFO] No sources to compile
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ mvnwebapp ---
[WARNING] Using platform encoding (Cp1252 actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory C:\Users\HP\.jenkins\workspace\mvnwebapp\src\test\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ mvnwebapp ---
[INFO] No sources to compile
[INFO]
[INFO] --- maven-surefire-plugin:2.12.4:test (default-test) @ mvnwebapp ---
[INFO] No tests to run.
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time: 3.576 s
[INFO] Finished at: 2017-05-10T12:22:33+05:30
[INFO] Final Memory: 8M/110M
[INFO] ------------------------------------------------------------------------
Finished: SUCCESS
```

Go back to Configure job

- Change the Build Goal from ***test*** to ***package***
- Run the build again and see the difference
- As you can see, .war has been generated

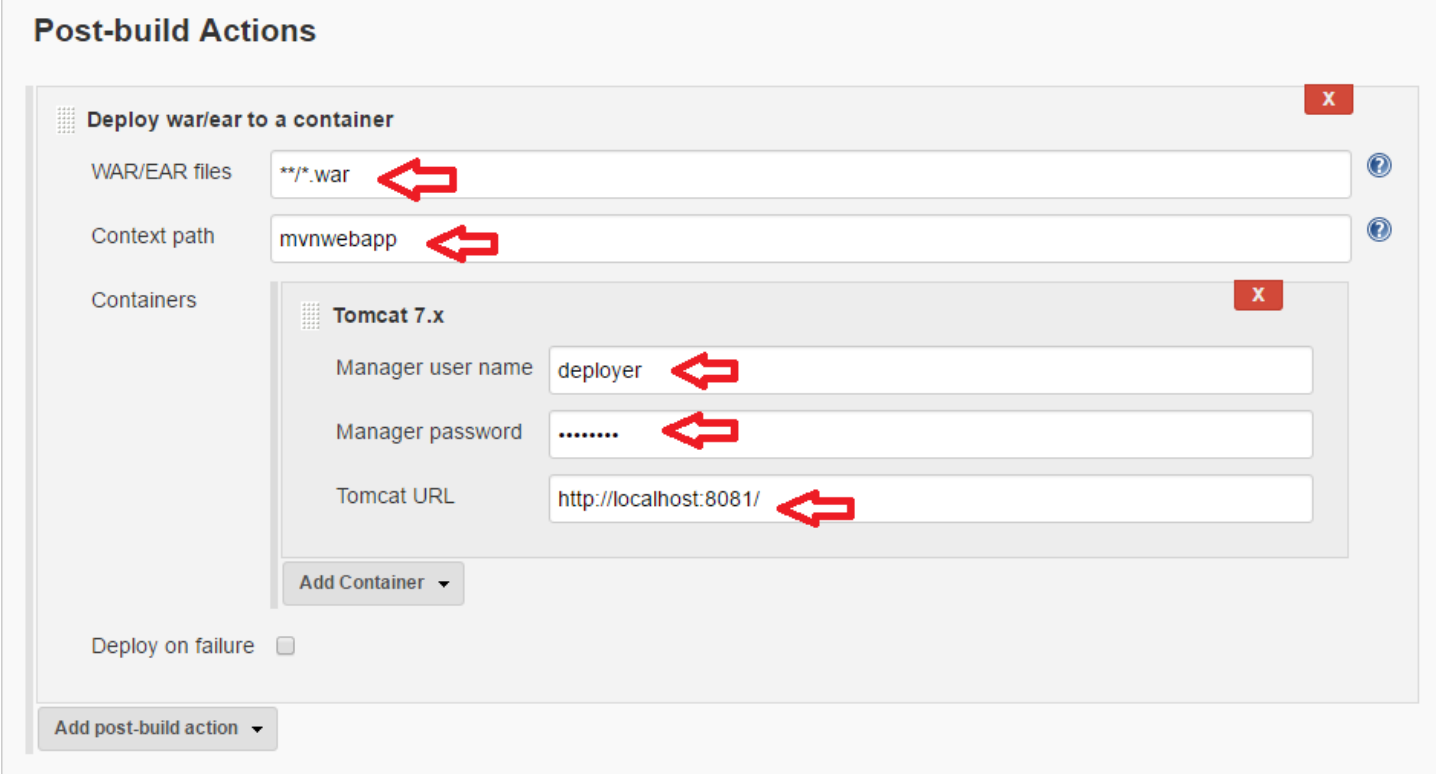
Reconfigure the job for post build action

- Add post-build action – Deploy war/ear to a container



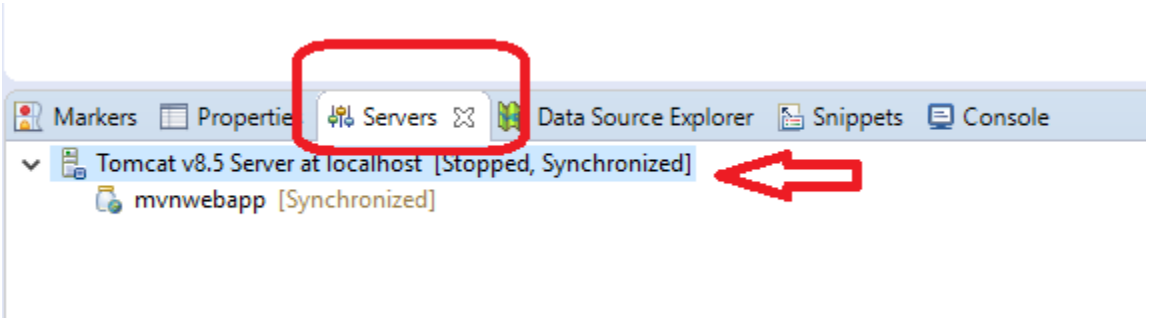
Reconfigure the job for post build action contd.

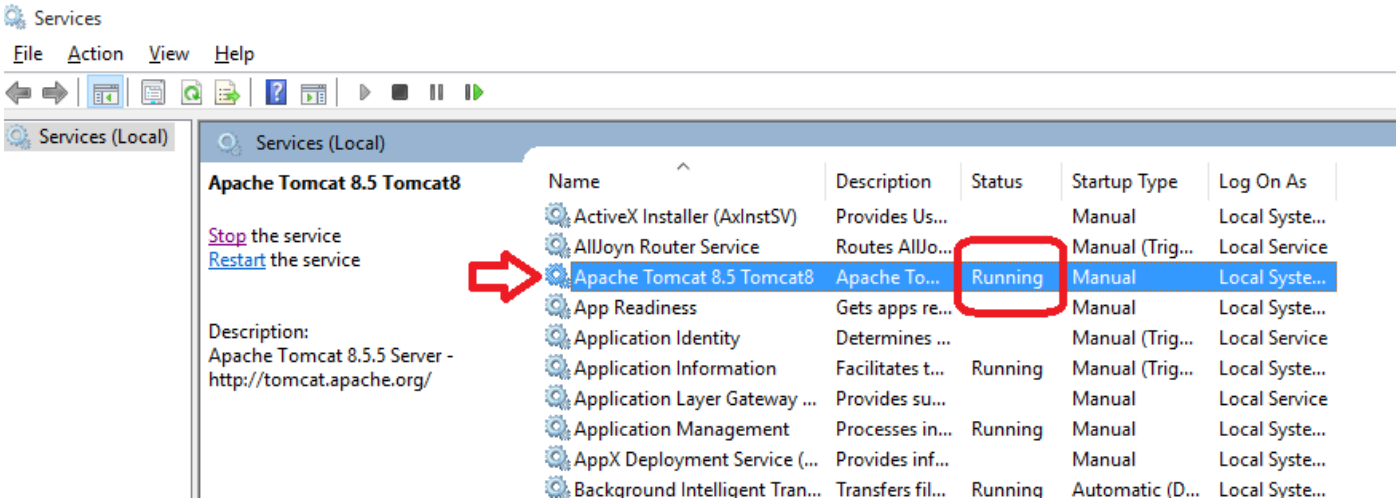
- Provide the path to war file
- Give a context path to be used for deployment (usually application name)
- Provide Tomcat user credentials for deployment (The entry we made in tomcat-users.xml)



Reconfigure the job for post build action contd.

- Save and Run the build
- If you are running Eclipse's internal Tomcat, please stop the server
- Make sure External Tomcat is running – Go to Services management console and check the status





Check Build console

- You can see that build was successful and deployment was success

```
[INFO] Building war: C:\Users\HP\.jenkins\workspace\mvnwebapp\target\mvnwebapp.war
[INFO] WEB-INF\web.xml already added, skipping
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time: 4.091 s
[INFO] Finished at: 2017-05-10T12:36:19+05:30
[INFO] Final Memory: 11M/110M
[INFO] ------------------------------------------------------------------------
Deploying C:\Users\HP\.jenkins\workspace\mvnwebapp\target\mvnwebapp.war to container Tomcat 7.x Remote
  [C:\Users\HP\.jenkins\workspace\mvnwebapp\target\mvnwebapp.war] is not deployed. Doing a fresh deployment.
  Deploying [C:\Users\HP\.jenkins\workspace\mvnwebapp\target\mvnwebapp.war]
Finished: SUCCESS
```

- Open a web browser and type the url http://localhost:8081/mvnwebapp/
- You should see ‘Hello World’ displayed