MVC

Servers in spring boot web applications

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The spring boot mvc / spring boot rest applications can be deployed and executed in two types of servers

a) spring boot Embedded servers (Good to use)

i) apache Tomcat (default) (popular) (1)

ii) Eclipse Jetty (2)

iii) Jboss undertow

b) external servers

i) apache tomcat (3)

ii) jetty

iii) wildfly (1)

iv) glassfish (2)

v) undertow

(3)

=>Embedded servers are part of Spring App's execution

=> External servers separately installed server'in the machine

application server = websever++

WebServer

vi) weblogic

vii) webshpere

viii) jboss

application serv

and etc... (In fact any java based web server or application server can be used)

Java Web server examples

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Tomcat upto 6.x, jetty, jonus, undertow and etc.. Java Application server examples

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wildfly, glassfish, weblogic, websphere, jrun, oracle 10g As

Tomcat 7.x onwords

(logging, auditing,securty ande etc...)

Application server = web server + EJB container + other containers + lots of Middleware services => spring boot is not given to develop EJB comps .. So we do not need EJB container for spring boot applications => Spring boot is given to develop standalone Apps, web applications, Ditributed Apps (restfull-web based) which are generally packaged as jar files/war files.. So to deploy and execute spring boot MVC Apps/ Spring rest apps there is no need of java based application servers.. we can manage with Java based web servers .. For this reason they have not given any Application server as embedded serversin spring boot.note::

nowadays both web applications/ webservices based distributed apps can be taken => EAR file (Enterpirse Application archieve) ear files are as the jar files/war files

ear file = jar file (ejb comp) +war file (web application) outdated files => spring boot does not support ear files deployment.. generally we need application server to deploy and execute ear files ... So to deploy and execute spring boot mvc/spring rest app we just need web servers like tomcat, jetty,undertow and etc..

=>In order to work with other embedded servers in spring boot mvc applications we need to disable spring-boot-tomcat-starter dependency from pom.xml file and we need to add other embedded servers starter dependencies to the pom.xml file

---.......-----.--

BootMVCProj22-Embedded Servers [boot]

>. Deployment Descriptor: BootMVCProj22-EmbeddedServers

> Spring Elements

>

JAX-WS Web Services

>

index.html

src/main/java

src/main/resources

✓ static

templates

application.properties

src/test/java

=>we can place static content in spring boot mvc application

in "static" folder of src/main/resources folder.

note:: In most of the web

Servers or application servers the default welcome for the java web application is "index.html" or index.jsp

=>static content means "css","js","images", "html","audio","video" and etc.. files. [src/main/resources]

static

Maven Dependencies

>

JRE System Library [JavaSE-11]

>

>

Deployed Resources

✓ **src**

main

> java

>

> test

> target

resources

webapp

WHELP.md

mvnw

mvnw.cmd Mpom.xml

|-----images

|--->*.jpg or *.png or etc..

html

-

--->*.html

---CSS

***.css**

---js

--->*.js

In Most of servers the index.html

placed in "static" folder of

"src/main/resources" folder will be taken

as default welcome file..

starter

Tomcat server dependency

In recent version of

MV

=>if we add spring-boot-web-starter by selecting "spring web" towards creating spring boot project then the spring-boot-tomcat-starter dependency will be coming automatically.. which gives embedded tomcat server.

spring boot.. it is coming

an independent and seperate

starter.. earlier it used come

<dependency>

as dependent jar file for spring-boot-web-starter dependency

To work with jetty server as the embedded server

======== spring-boot-starter-tomcat step1) dissable

<groupId>org.springframework.boot</groupId> <artifactId>spring-boot-starter-tomcat</artifactId>

<scope>provided</scope>

</dependency>

dependency from pom.xml file

```
<groupId>org.springframework.boot</groupId>
<!-- <dependency>
```

Tomcat upto version 6 :: WebServer

Tomcat from version 7 onwords :: ApplicationServer

```
<artifactId>spring-boot-starter-tomcat</artifactId>
<scope>provided</scope>
</dependency> -->
```

(or) (and)

In new versions

```
<dependency>
```

In old versions

```
<groupId>org.springframework.boot</groupId> <artifactId>spring-boot-starter-web</artifactId>
<exclusions>
<exclusion>
<groupId>org.springframework.boot</groupId> <artifactId>spring-boot-starter-tomcat</artifactId>
</exclusion>
```

Go to dependecy hierarchy tab in pom.xml file, search for spring-boot-starter-tomcat jar and execlude that jar file by using right click exclude option.

```
</exclusions>
</dependency>
```

step2) adu

spring-boot-starter-jetty

ependency to pom.xml

```
<!-- https://mvnrepository.com/artifact/org.springframework.boot/spring-boot-starter-jetty --> <dependency>
<groupId>org.springframework.boot</groupId>
<artifactId>spring-boot-starter-jetty</artifactId>
</dependency>
```

step3) Run the application as standalone App

Right click on the Project --->run as ---> spring boot App

step4) Test the Application..

url in browser :: http://localhost:4041/ServersApp/

index.html

application.properties

```
server.port=4041
server.servlet.context-path=/ServersApp
```

```
<!DOCTYPE html>
<html>
```

```
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<h1 style="color:blue;text-align:center"> welcome to spring boot MVC </h1>
</body> </html>
```

Procedure to use the "JBOSS undertow" server as the embedded server in spring boot MVC

===

step1) same as

above

step2) add "spring-boot-starter-underow" to pom.xml

```
<!-- https://mvnrepository.com/artifact/org.springframework.boot/spring-boot- starter-undertow -->
<dependency>
<groupId>org.springframework.boot</groupId> <artifactId>spring-boot-starter-undertow</artifactId>
</dependency>
```

step3 & step4) same as above...

if we add all the 3 embedded server's dependency starters to pom.xml file then the spring boot mvc app chooses the embedded server in the following order a) tomcat

b) jetty (if tomcat dependency is not avaialbe)

c) under tow ((if tomcat,jetty dependencies are not avaialbe)

boot Adding "Dev Tools" support to spring boot web MVC/spring rest Project

if we add the starters of all the 3 servers (tomcat,jetty and undertow) to the pom.xml file can u tell me which server will be taken as final server?

Ans) Tomcat server

=>generally when we do source code changes (especially java code) in spring boot web mvc, spring rest applications we need to restart server to reflect that changes.. Some IDEs like eclipse automatically reloads the web application for code changes but that is not so effective some times.. which again forces us to go for clean project,restart ide and etc.. addtional activities. [Some times these IDEs will not recognize the changes done static content especially css files, js files] to recognize

in

=>To overcome this problem and simplify code modifications in the development mode of the project, it is recomanded to add "spring-boot -devtools"

dependency to pom.xml

note:: when we are running the web application or distributed app in embedded server env.. the changes done in source code will not reflect in deployed apps automatically for this we need to add "dev tools" starter which moves current app to Parellel Live Server and there executes the code by reloading the application..

note:: if the java web applications are deployed in external server configured with IDEs, then changes done in source code will be reflect automatically because the external server automatically reloads the web

application for every change done to the source code

in pom.xml

add

```
<dependency>
<groupId>org.springframework.boot</groupId> <artifactId>spring-boot-devtools</artifactId>
</dependency>
```

we can this stater as the dependency while creating the project or after creating project

using (right click on project --->spring--->add devtools)

devtools:: Developer Tools

note: the moment if we try to save chanages done in .java files using "save" button or ctrl+s key the dev tools recognizes the changes in .class files (byte code) and internally uses some live parellel server to reflect changes.. by restarting servers and reloading the apps..

What is difference b/w web server and Application server?

Application server = web server ++

web server

a) It is given to deploy and execute only web applications,

Application server

a) It is given to deploy and execute web applications, distributed Apps (web services based, EJB Based), and enterprise apps

web services based distributed Apps and etc..

b) Developed based on

servlet,jsp, JMS, Jaas, EJB, jta and etc.. technologies of JEE module

b) Developed based on Servlet,jsp technologies of JEE module

c) Gives Servlet Container, Jsp container

c) Gives SErvlet container, jsp container and EJB Container

d) Gives very less middleware services (like Security, logging, Transaction mgmt. and etc..)

e) allows only http,https protocols

f) suitable for small scale web applications, distributed apps

g) Does not support Messaging activites (Messaging based communication b/w the Apps)

d) Gives more and more middleware services

(security, logging, transaction mgmt, auditing, mailing, health checks and etc..)

e) allows http,https, jrmp, smtp, imap,pop3 and etc.. protocols

f) suitable for medium scale, large scale web applications, distributed apps

g) Supports Messaging based communication using JMS

h) does not give built-in mail server

i) Bit light weight (size wise)

h) Gives built-in mail server (for managing email accounts and messages)

i) Bit heavy weight (size wise)

j) eg:: tomcat (upto 6.x version), jetty, resin, joHs, undertow and etc..

j) eg: weblogic, websherpere, oracle10gAs, Jrun, GlassFish, wildfly and etc...

Procedure to configure wildfly server to Eclipse IDE to deploy and execute spring boot MVC application

step1) Download wildfly server as the from internet as the zip file

(https://www.wildfly.org/downloads/)

step2) extract the above zip file for installing wildfly server

```
D:\Wildfly36.xSoft\wildfly-36.0.0.Final\bin>add-user.bat

What type of user do you wish to add?

a) Management User (mgmt-users.properties)

b) Application User (application-users.properties)

(a):

Enter the details of the new user to add.

Using realm 'ManagementRealm' as discovered from the existing property files.

Username: raja

Password recommendations are listed below. To modify these restrictions edit the
add-user.properties configuration file. The password should be different from the
username

The password should not be one of the following restricted values {root, admin,
administrator}

The password should contain at least 8 characters, 1 alphabetic character(s), 1
digit(s), 1 non-alphanumeric symbol(s) Password: raja1234*

Re-enter Password : raja1234*

What groups do you want this user to belong to? (Please enter a comma separated list,
or leave blank for none)[ ]: About to add user 'raja' for realm 'ManagementRealm'

Is this correct yes/no? y

Added user 'raja' to file
'D:\Wildfly36.xSoft\wildfly-36.0.0.Final\standalone\configuration\mgmt-users.propertie
s' Added user 'raja' to file
'D:\Wildfly36.xSoft\wildfly-36.0.0.Final\domain\configuration\mgmt-users.properties'

Added user 'raja' with groups to file
'D:\Wildfly36.xSoft\wildfly-36.0.0.Final\standalone\configuration\mgmt-groups.properti
es'

Added user 'raja' with groups Press any key to continue

to file
'D:\Wildfly36.xSoft\wildfly-36.0.0.Final\domain\configuration\mgmt-groups.properties'
```

step3) Install Wildfly server adapter tools/plugins in Eclipse IDE

window menu -->preferences ---> server --->Runtime env ---> add --->

select Redhat Jboss --->

jboss, wildfly,jboss erp tools ---> next ---> accept terms and conditions --->... ---> restart the IDE

step4)