Java Plays : Eclipse Lab 3

Remote Development and Debugging using Eclipse

Presented by:

IBM

ECOD

IBM Cloud

AGENDA

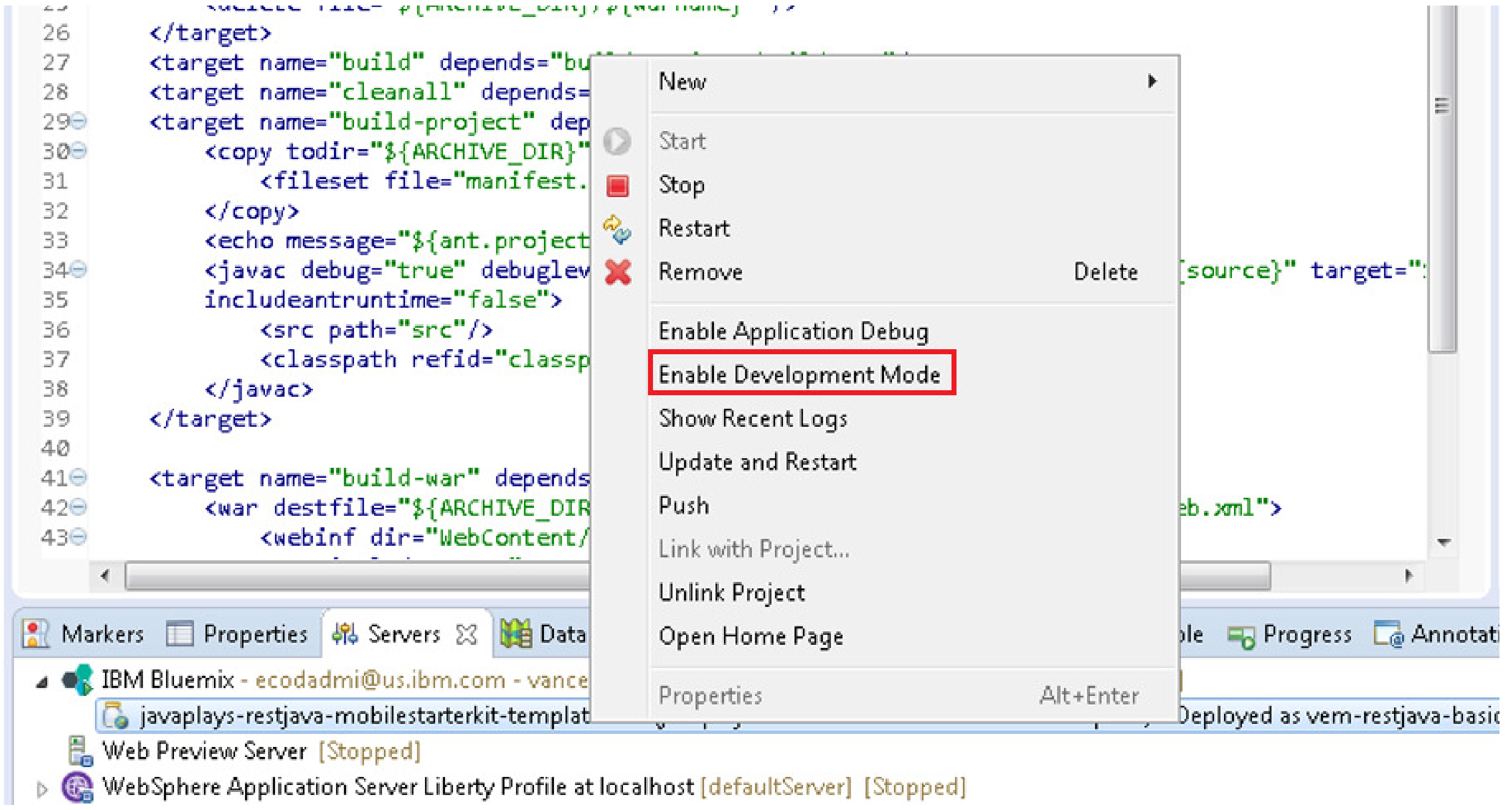
Purpose of This Lab

In this lab, you will learn how to enable remote development of a project that has been linked to Bluemix server. When remote development mode is turned on, you can incrementally push changes to Bluemix server, without restarting the application!

Also we will explore how to debug an application deployed on WebSphere Liberty server, locally. Debugging mode helps to pin point specific code where an error happens when a user request or server response is sent.

Step1 : Enable Remote Development Mode in Eclipse

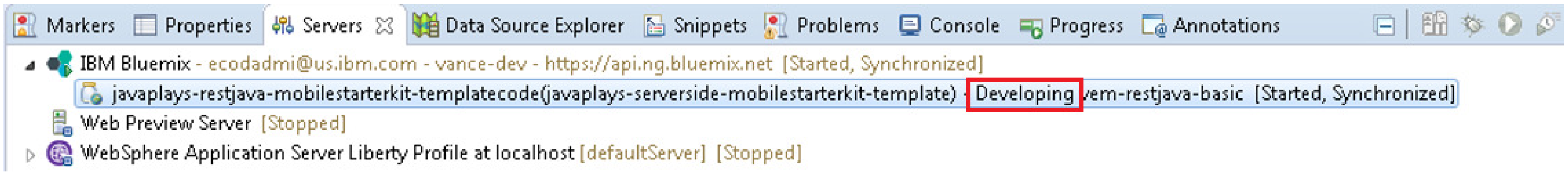
❑In **Servers** view, right click on project, select ***Enable Development Mode***



```
</target>
<target name="build" depends="bu
<target name="cleanall" depends=
<target name="build-project" dep
    <copy todir="${ARCHIVE_DIR}"
        <fileset file="manifest.
    </copy>
    <echo message="${ant.project
    <javac debug="true" debuglev                                  [source}" target="
    includeantruntime="false">
        <src path="src"/>
        <classpath refid="classp
    </javac>
</target>

<target name="build-war" depends
    <war destfile="${ARCHIVE_DIR                                  eb.xml">
        <webinf dir="WebContent/
```

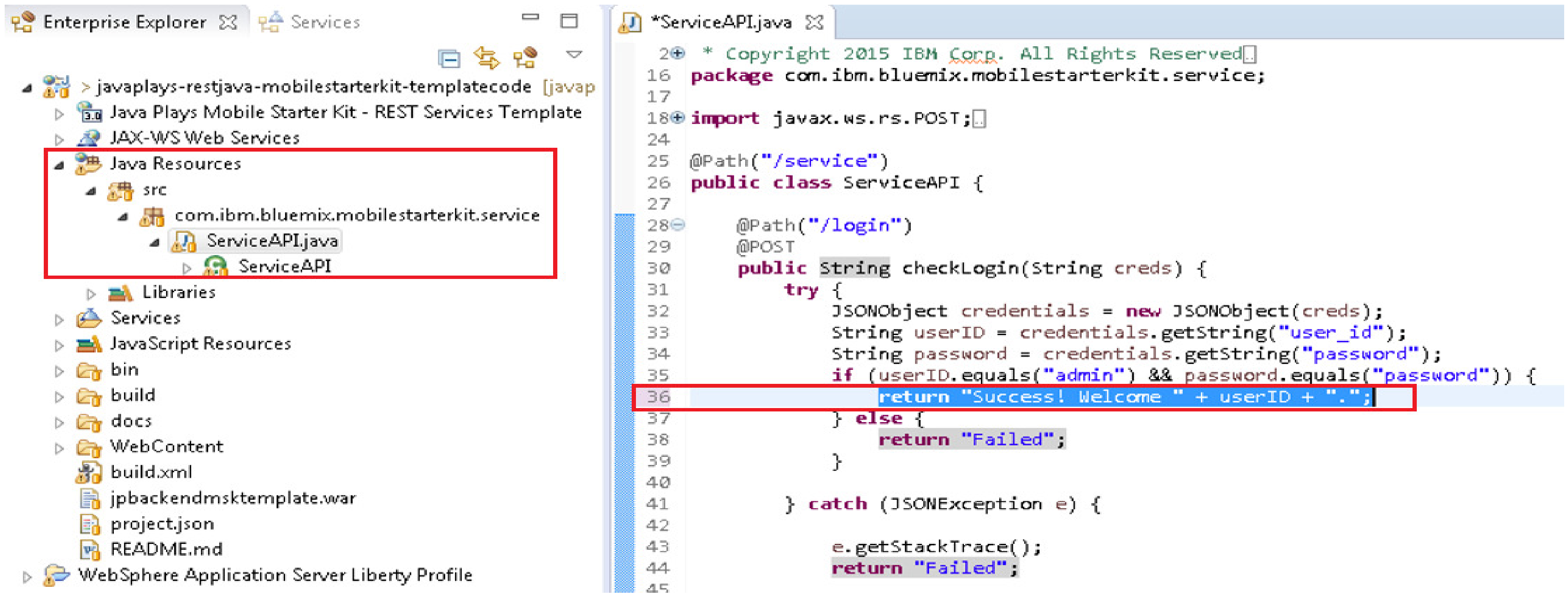
IBM Bluemix - ecodadmi@us.ibm.com - vance
javaplays-restjava-mobilestarterkit-templat … Deployed as vem-restjava-basic
Web Preview Server [Stopped]
WebSphere Application Server Liberty Profile at localhost [defaultServer] [Stopped]

❑Output – Success Message – Bluemix server is in ***Developing*** mode



IBM Bluemix - ecodadmi@us.ibm.com - vance-dev - https://api.ng.bluemix.net [Started, Synchronized]
javaplays-restjava-mobilestarterkit-templatecode(javaplays-serverside-mobilestarterkit-template) - Developing vem-restjava-basic [Started, Synchronized]
Web Preview Server [Stopped]
WebSphere Application Server Liberty Profile at localhost [defaultServer] [Stopped]

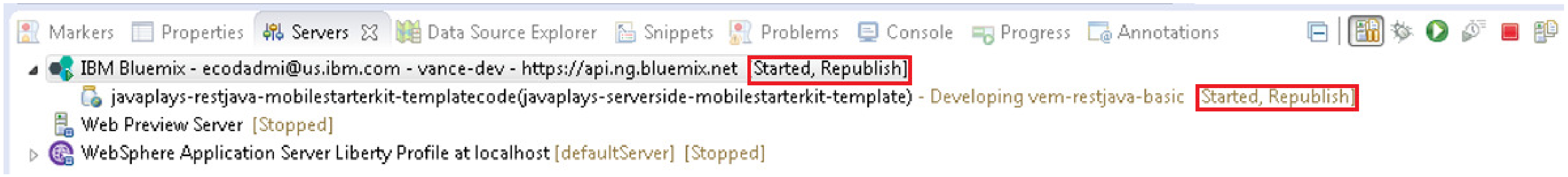
- ❑In **Enterprise Explorer**, expand ***Java Resources > src > com.ibm.bluemix.mobilestarterkit.service > ServiceAPI.java***
- ❑Make code changes in ***ServiceAPI.java***
- ❑***Save***



```java
 * Copyright 2015 IBM Corp. All Rights Reserved
package com.ibm.bluemix.mobilestarterkit.service;

import javax.ws.rs.POST;

@Path("/service")
public class ServiceAPI {

    @Path("/login")
    @POST
    public String checkLogin(String creds) {
        try {
            JSONObject credentials = new JSONObject(creds);
            String userID = credentials.getString("user_id");
            String password = credentials.getString("password");
            if (userID.equals("admin") && password.equals("password")) {
                return "Success! Welcome " + userID + ".";
            } else {
                return "Failed";
            }

        } catch (JSONException e) {

            e.getStackTrace();
            return "Failed";
```

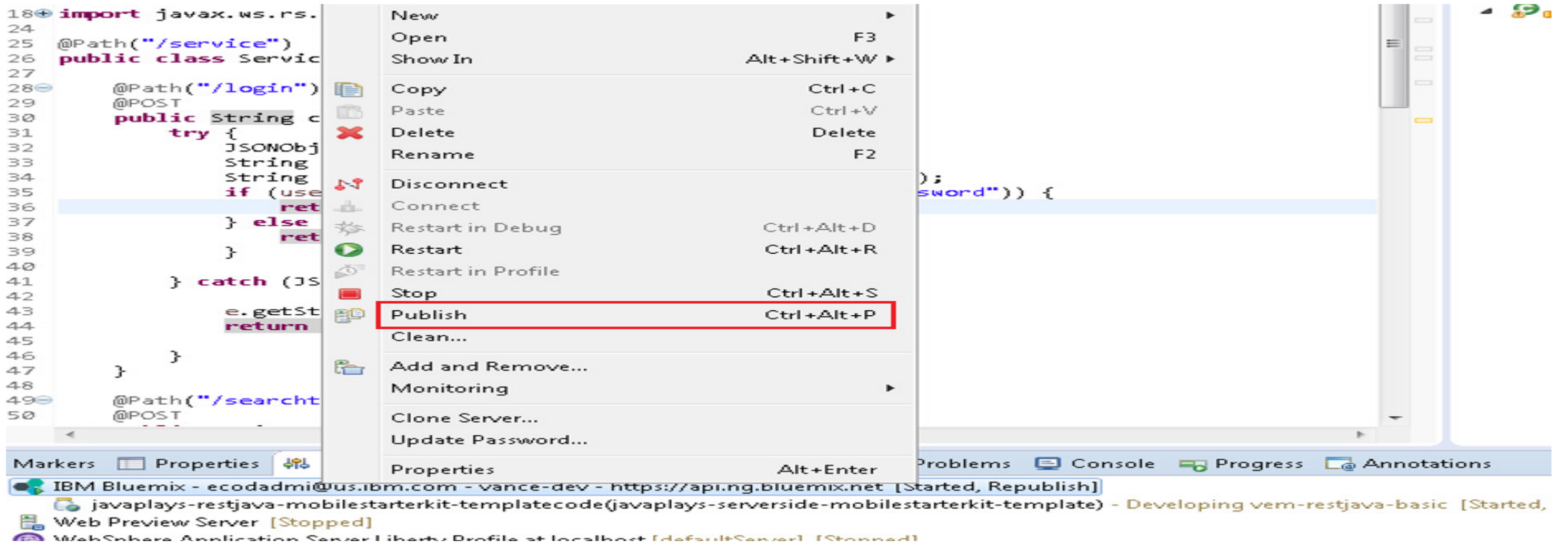
Step 2: Push Incremental Changes

- ❑In **Servers** tab, observe ***Server** status **[Started, Republish]***



```
IBM Bluemix - ecodadmi@us.ibm.com - vance-dev - https://api.ng.bluemix.net [Started, Republish]
    javaplays-restjava-mobilestarterkit-templatecode(javaplays-serverside-mobilestarterkit-template) - Developing vem-restjava-basic [Started, Republish]
Web Preview Server [Stopped]
WebSphere Application Server Liberty Profile at localhost [defaultServer] [Stopped]
```

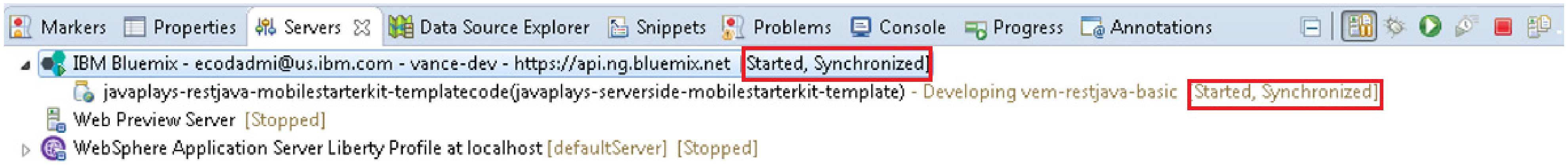
- ❑Right click on **Bluemix server**, and select ***Publish***



```
import javax.ws.rs.

@Path("/service")
public class Servic

    @Path("/login")
    @POST
    public String c
        try {
            JSONObj
            String
            String                                        );
            if (use                                       sword")) {
                ret
            } else
                ret
            }

        } catch (JS

            e.getSt
            return

        }
    }

    @Path("/searcht
    @POST
```

```
IBM Bluemix - ecodadmi@us.ibm.com - vance-dev - https://api.ng.bluemix.net [Started, Republish]
    javaplays-restjava-mobilestarterkit-templatecode(javaplays-serverside-mobilestarterkit-template) - Developing vem-restjava-basic [Started,
Web Preview Server [Stopped]
WebSphere Application Server Liberty Profile at localhost [defaultServer] [Stopped]
```

❑Output – Observe **Bluemix server** status ***[Started, Synchronized]***



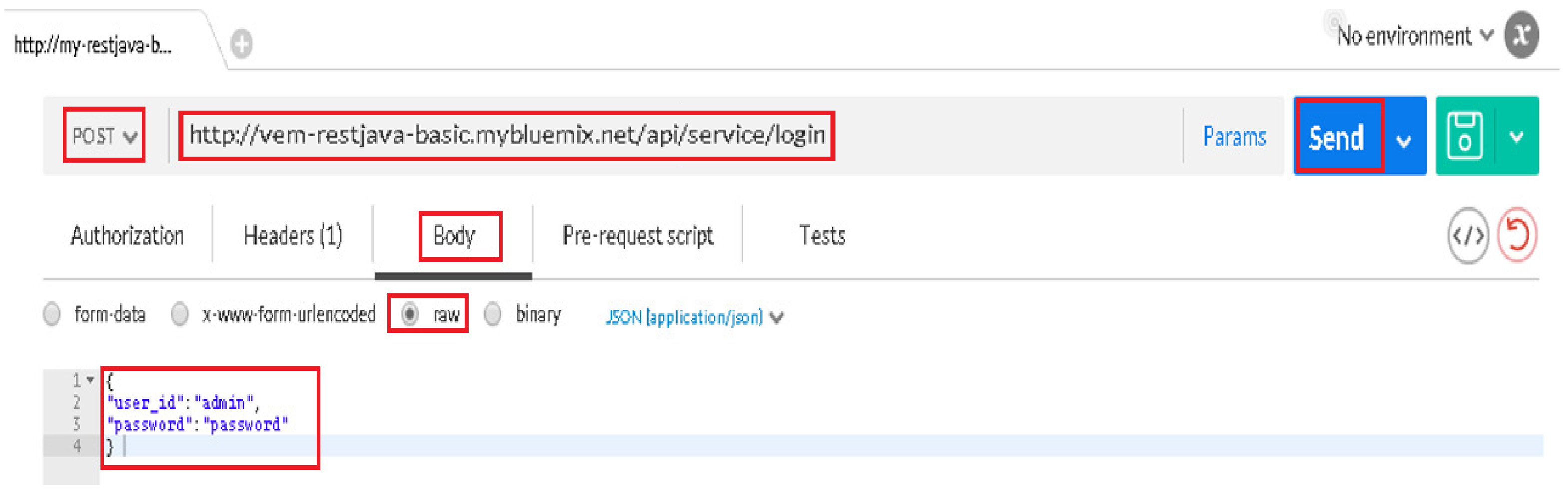
```
IBM Bluemix - ecodadmi@us.ibm.com - vance-dev - https://api.ng.bluemix.net [Started, Synchronized]
    javaplays-restjava-mobilestarterkit-templatecode(javaplays-serverside-mobilestarterkit-template) - Developing vem-restjava-basic [Started, Synchronized]
Web Preview Server [Stopped]
WebSphere Application Server Liberty Profile at localhost [defaultServer] [Stopped]
```

Step 3: Test with Postman

- ❑Open ***Postman*** extension page in Chrome browser
- ❑Change to ***POST*** method
- ❑Enter http://<your hostname>.mybluemix.net/api/service/login
- ❑Click ***Body*** tab
- ❑Select ***raw***
- ❑Enter the following

```
{
        "user_id": "admin",
        "password": "password"
}
```

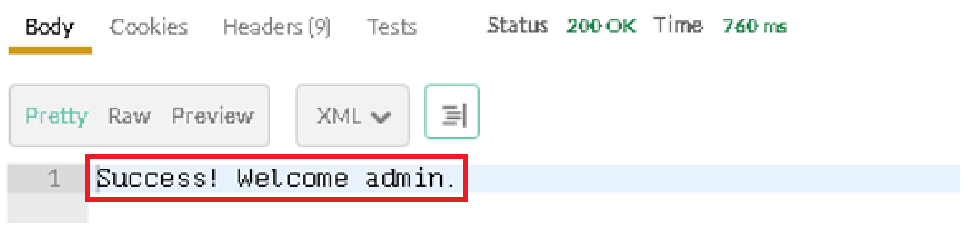
- ❑Click ***Send***



http://vem-restjava-basic.mybluemix.net/api/service/login

```
{
"user_id":"admin",
"password":"password"
}
```

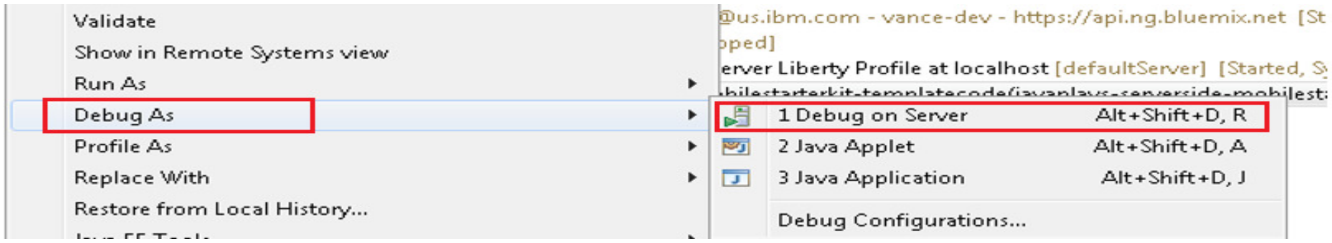
❑Success Message



```
Success! Welcome admin.
```

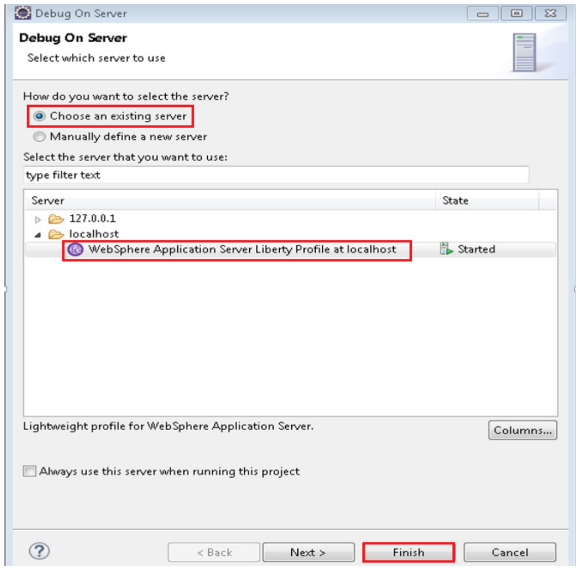
Step 4: Enable Local Debug Mode in Liberty Profile

❑In **Enterprise Explorer** view, right click on project, select ***Debug As > Debug on Server***


Validate
Show in Remote Systems view
Run As
Debug As
Profile As
Replace With
Restore from Local History...
1 Debug on Server Alt+Shift+D, R
2 Java Applet Alt+Shift+D, A
3 Java Application Alt+Shift+D, J
Debug Configurations...

@us.ibm.com - vance-dev - https://api.ng.bluemix.net [St
pped]
erver Liberty Profile at localhost [defaultServer] [Started, S

❑Choose an **existing server**
❑Select ***WebSphere Application Server Liberty Profile at localhost***
❑Click ***Finish***


Debug On Server

Debug On Server
Select which server to use

How do you want to select the server?
(●) Choose an existing server
( ) Manually define a new server

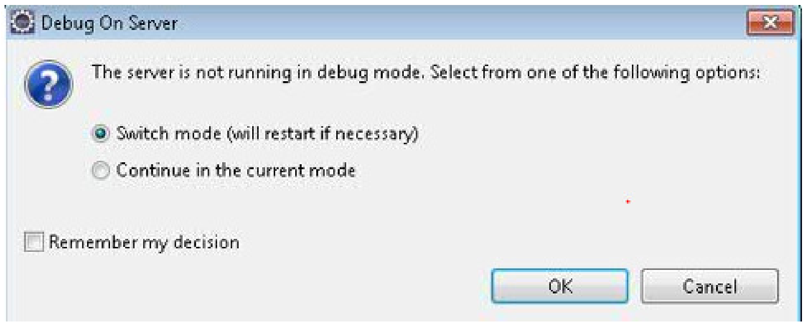
Select the server that you want to use:
type filter text

Server	State
▷ 127.0.0.1	
◢ localhost	
WebSphere Application Server Liberty Profile at localhost	Started

Lightweight profile for WebSphere Application Server.

☐ Always use this server when running this project

- ❑Switch to ***Debug mode***
- ❑*Click **OK***

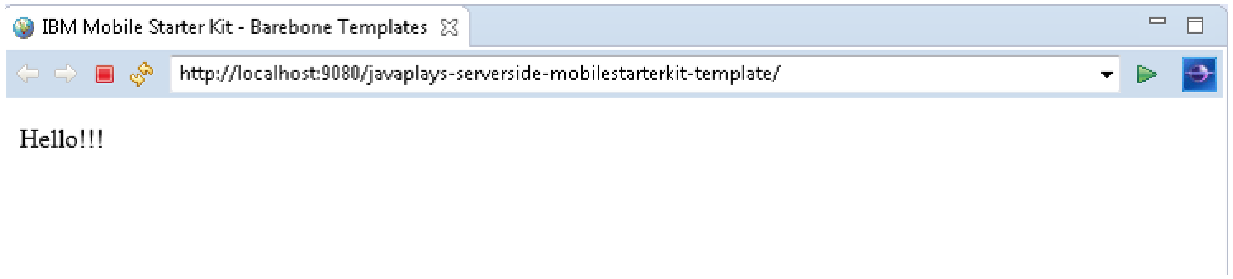


The server is not running in debug mode. Select from one of the following options:

- [✓ Switch mode (will restart if necessary)]
- Continue in the current mode

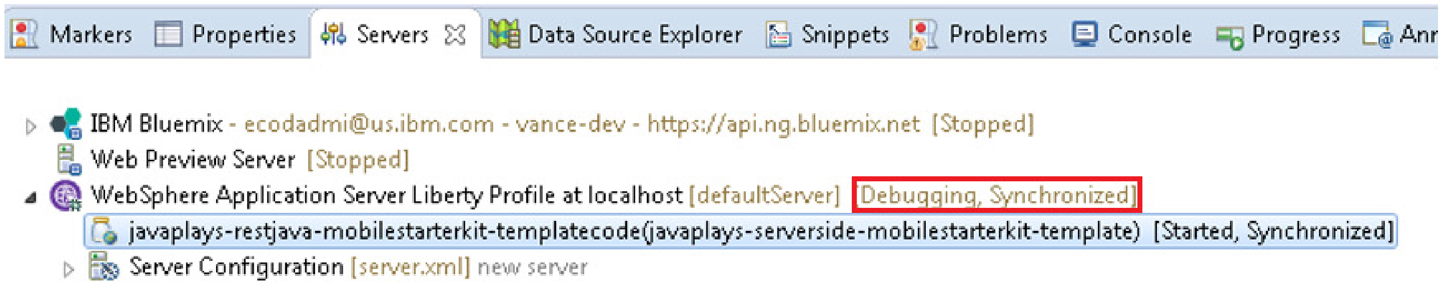
Remember my decision

❑Success Message – Webpage displayed successfully


IBM Mobile Starter Kit - Barebone Templates
http://localhost:9080/javaplays-serverside-mobilestarterkit-template/

Hello!!!

❑Observe local WebSphere Liberty Server status ***[Debugging, Synchronized]***



IBM Bluemix - ecodadmi@us.ibm.com - vance-dev - https://api.ng.bluemix.net [Stopped]
Web Preview Server [Stopped]
WebSphere Application Server Liberty Profile at localhost [defaultServer] [Debugging, Synchronized]
javaplays-restjava-mobilestarterkit-templatecode(javaplays-serverside-mobilestarterkit-template) [Started, Synchronized]
Server Configuration [server.xml] new server

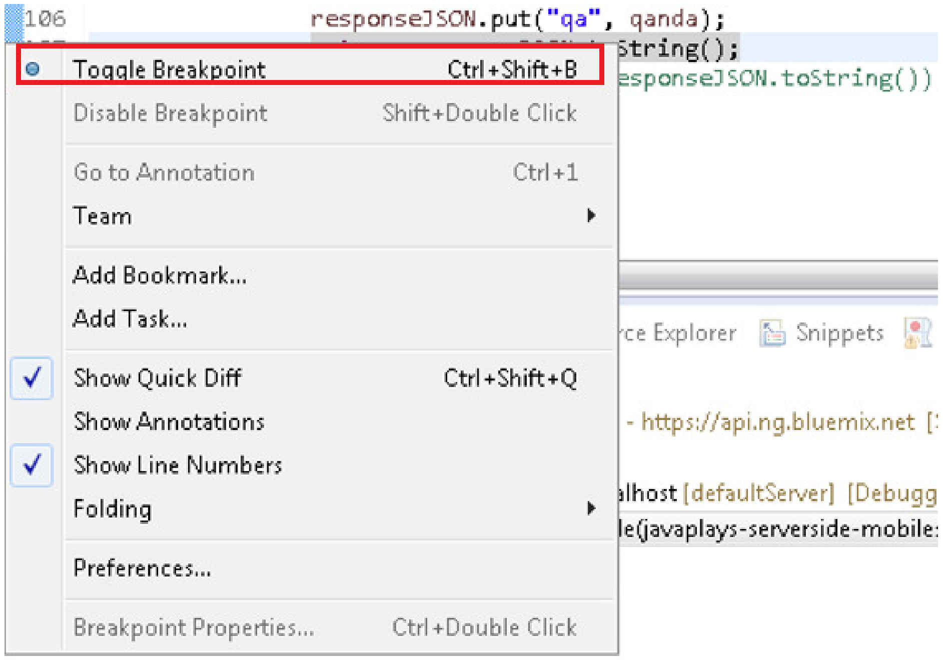
- In **Enterprise Explorer** view, open ***ServiceAPI.java***, and set a ***breakpoint***

- 2 ways to set breakpoint:

  - Right click on the blue sidebar (on the left of line number) and select ***toggle breakpoint***

    OR

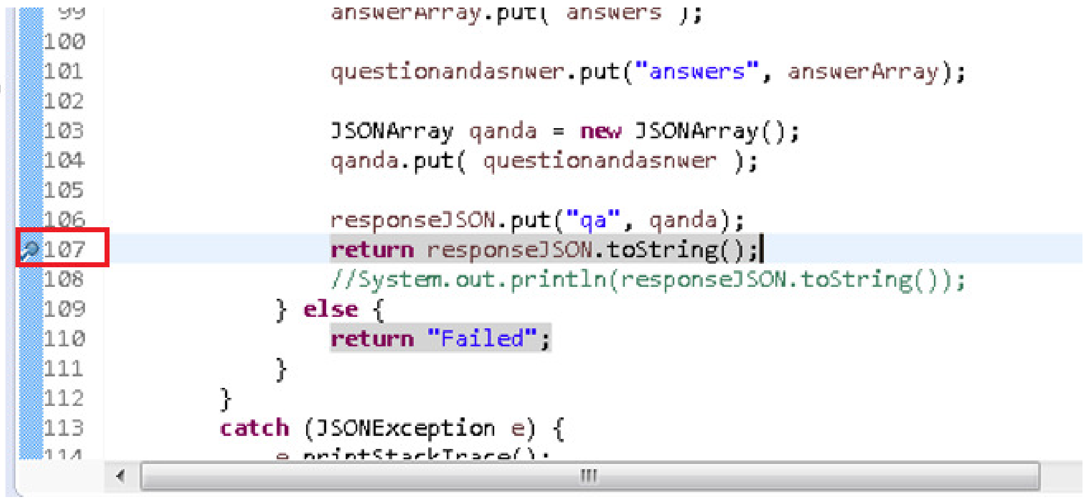
  - Double click on the blue sidebar (on the left of line number)



```
responseJSON.put("qa", qanda);
String();
esponseJSON.toString())
```

Toggle Breakpoint Ctrl+Shift+B
Disable Breakpoint Shift+Double Click
Go to Annotation Ctrl+1
Team
Add Bookmark...
Add Task...
Show Quick Diff Ctrl+Shift+Q
Show Annotations
Show Line Numbers
Folding
Preferences...
Breakpoint Properties... Ctrl+Double Click
ce Explorer
Snippets
- https://api.ng.bluemix.net [
lhost [defaultServer] [Debugg
le(javaplays-serverside-mobile:

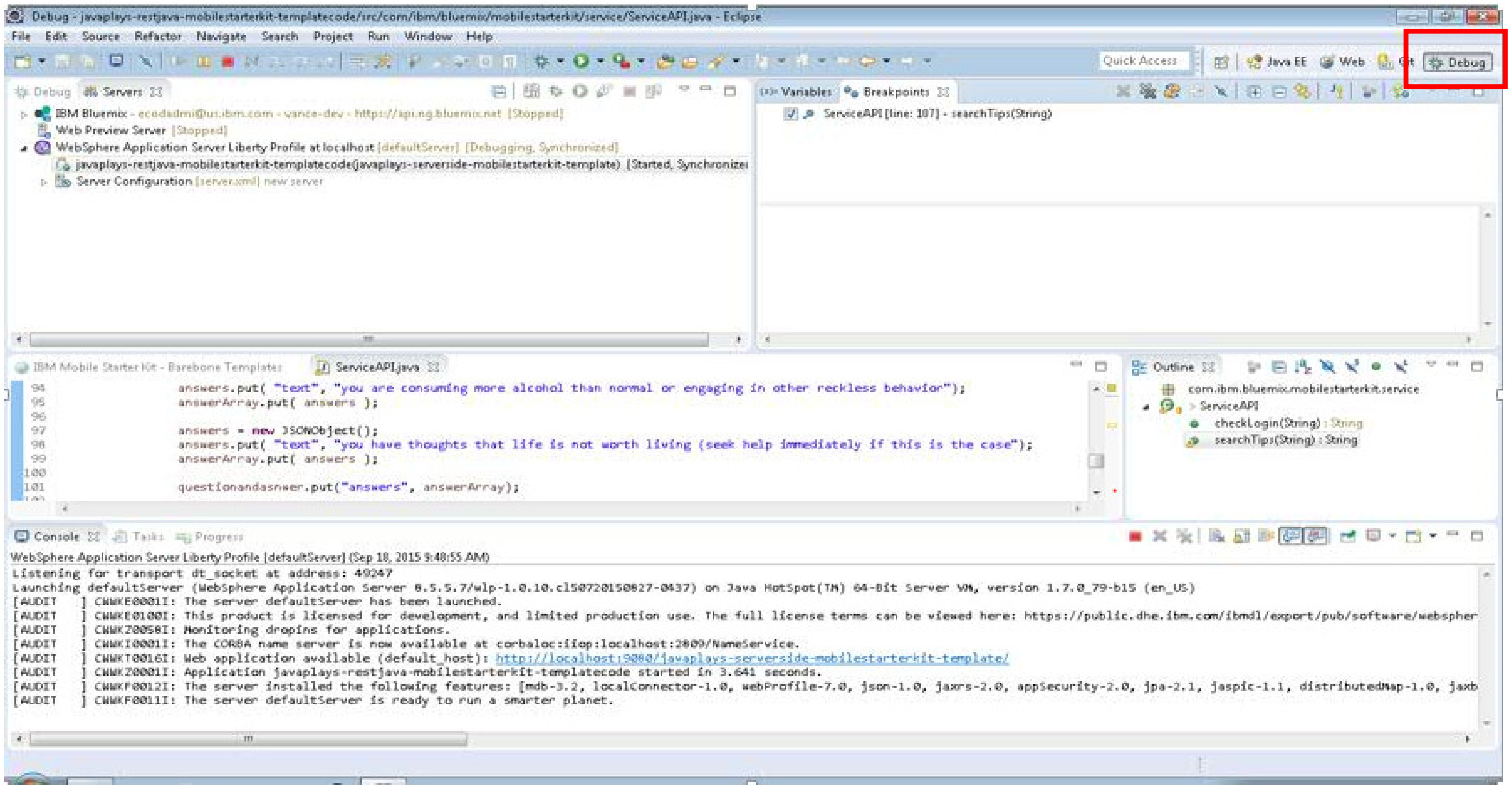
- Output – a blue dart icon appear next to the line



```
                answerArray.put( answers );

                questionandasnwer.put("answers", answerArray);

                JSONArray qanda = new JSONArray();
                qanda.put( questionandasnwer );

                responseJSON.put("qa", qanda);
                return responseJSON.toString();
                //System.out.println(responseJSON.toString());
            } else {
                return "Failed";
            }
        }
        catch (JSONException e) {
            e.printStackTrace();
```

Step 5: Test Local Debug Session

❑Switch to **Debug Perspective**


Debug - javaplays-restjava-mobilestarterkit-templatecode/src/com/ibm/bluemix/mobilestarterkit/service/ServiceAPI.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Quick Access
Java EE
Web
Debug
Debug
Servers
Variables
Breakpoints
Outline
IBM Mobile Starter Kit - Barebone Templates
ServiceAPI.java
Console
Tasks
Progress

IBM Bluemix - ecodadmi@us.ibm.com - vance-dev - https://api.ng.bluemix.net [Stopped]
Web Preview Server [Stopped]
WebSphere Application Server Liberty Profile at localhost [defaultServer] [Debugging, Synchronized]
javaplays-restjava-mobilestarterkit-templatecode(javaplays-serverside-mobilestarterkit-template) [Started, Synchronize
Server Configuration [server.xml] new server

ServiceAPI [line: 107] - searchTips(String)

com.ibm.bluemix.mobilestarterkit.service
ServiceAPI
checkLogin(String) : String
searchTips(String) : String

```
                answers.put( "text", "you are consuming more alcohol than normal or engaging in other reckless behavior");
                answerArray.put( answers );

                answers = new JSONObject();
                answers.put( "text", "you have thoughts that life is not worth living (seek help immediately if this is the case");
                answerArray.put( answers );

                questionandasnwer.put("answers", answerArray);
```

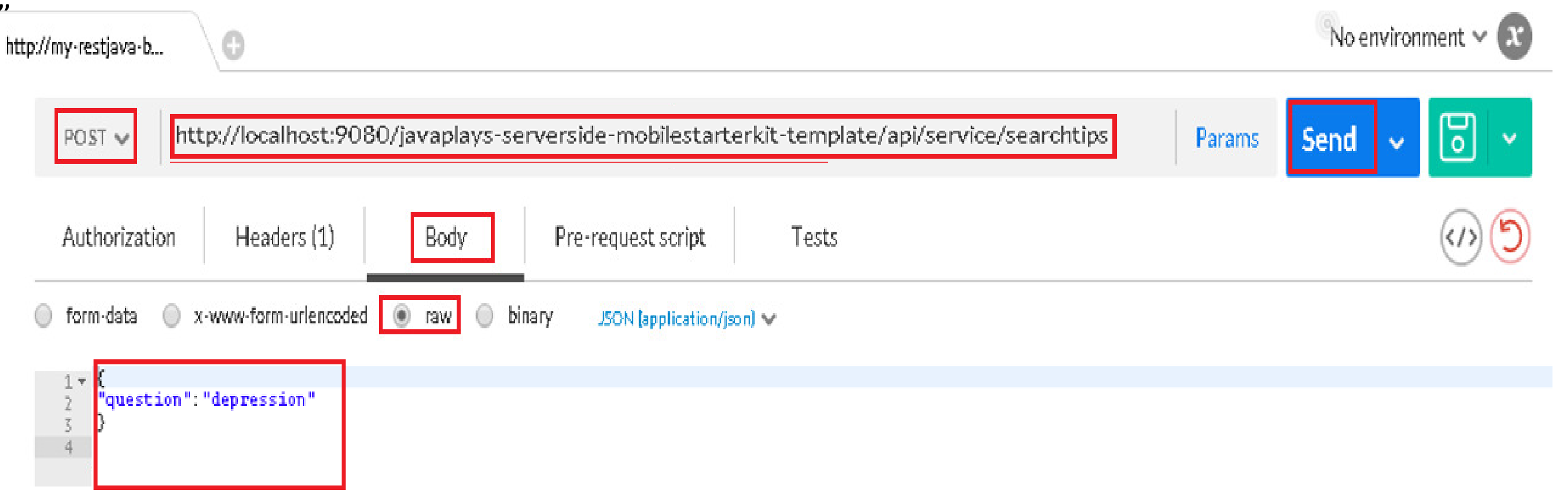
WebSphere Application Server Liberty Profile [defaultServer] (Sep 18, 2015 9:48:55 AM)

```
Listening for transport dt_socket at address: 49247
Launching defaultServer (WebSphere Application Server 8.5.5.7/wlp-1.0.10.cl50720150827-0437) on Java HotSpot(TM) 64-Bit Server VM, version 1.7.0_79-b15 (en_US)
[AUDIT   ] CWWKE0001I: The server defaultServer has been launched.
[AUDIT   ] CWWKE0100I: This product is licensed for development, and limited production use. The full license terms can be viewed here: https://public.dhe.ibm.com/ibmdl/export/pub/software/websphere
[AUDIT   ] CWWKZ0058I: Monitoring dropins for applications.
[AUDIT   ] CWWKI0001I: The CORBA name server is now available at corbaloc:iiop:localhost:2809/NameService.
[AUDIT   ] CWWKT0016I: Web application available (default_host): http://localhost:9080/javaplays-serverside-mobilestarterkit-template/
[AUDIT   ] CWWKZ0001I: Application javaplays-restjava-mobilestarterkit-templatecode started in 3.641 seconds.
[AUDIT   ] CWWKF0012I: The server installed the following features: [mdb-3.2, localConnector-1.0, webProfile-7.0, json-1.0, jaxrs-2.0, appSecurity-2.0, jpa-2.1, jaspic-1.1, distributedMap-1.0, jaxb
[AUDIT   ] CWWKF0011I: The server defaultServer is ready to run a smarter planet.
```

❑Open ***Postman*** extension page in Chrome browser
❑Change to ***POST*** method
❑Enter http://localhost:9080/javaplays-serverside-mobilestarterkit-template/api/service/searchtips
❑Click ***Body*** tab
❑Select ***raw***
❑Enter the following

```
{
        “question” = “depression”
}
```

❑Click ***Send***



POST

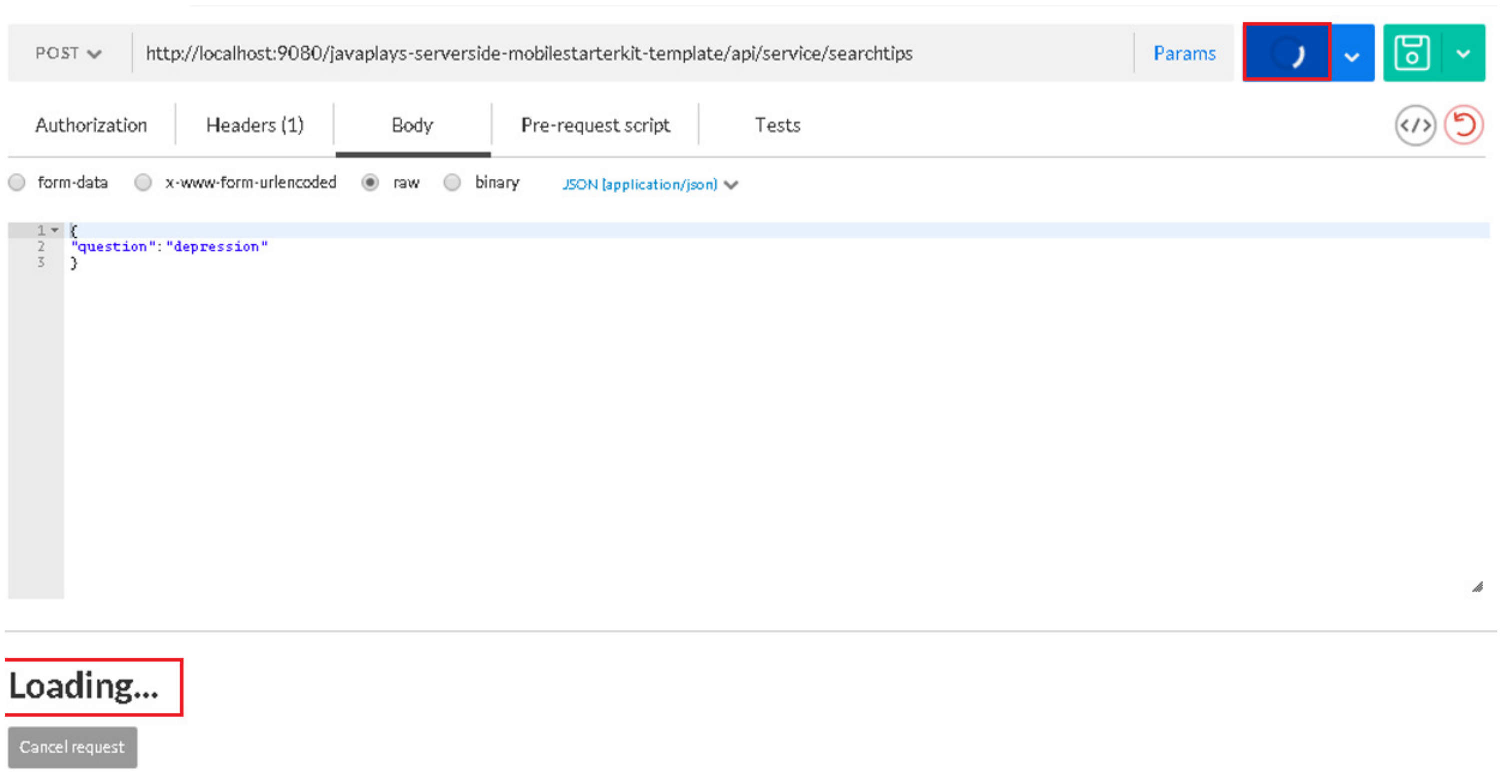
http://localhost:9080/javaplays-serverside-mobilestarterkit-template/api/service/searchtips

Body

raw [✓ raw] JSON (application/json)

```
{
"question":"depression"
}
```

- ❑Output – loading icon
- ❑Will continue to load until we go back to Eclipse to resume the process

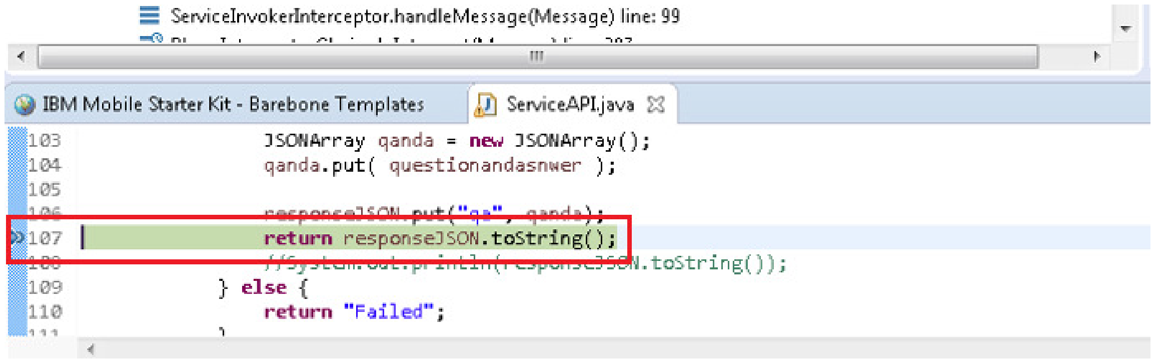


POST http://localhost:9080/javaplays-serverside-mobilestarterkit-template/api/service/searchtips

Body: raw — JSON (application/json)

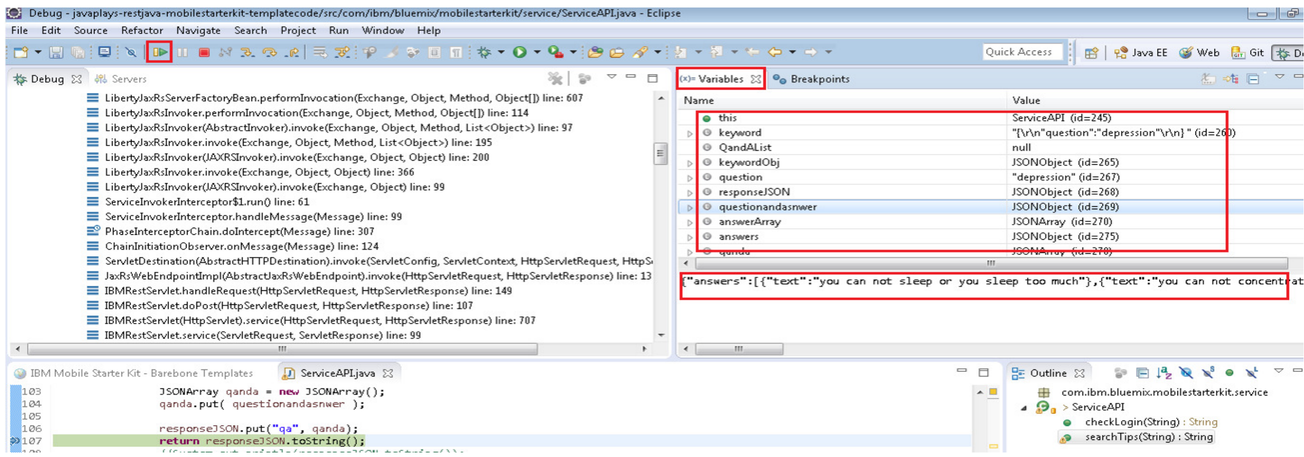
```
{
"question":"depression"
}
```

- ❑Back to **Eclipse**, the line with breakpoint is highlighted


ServiceInvokerInterceptor.handleMessage(Message) line: 99
IBM Mobile Starter Kit - Barebone Templates
ServiceAPI.java

```
                JSONArray qanda = new JSONArray();
                qanda.put( questionandasnwer );

                responseJSON.put("qa", qanda);
                return responseJSON.toString();
                //System.out.println(responseJSON.toString());
            } else {
                return "Failed";
```

- ❑In **Variables** view, validate the variables and their values
- ❑2 ways to resume the operation:
  - ❑ Click ***Resume*** icon
  - ❑ Press F8


Debug - javaplays-restjava-mobilestarterkit-templatecode/src/com/ibm/bluemix/mobilestarterkit/service/ServiceAPI.java - Eclipse
File
Edit
Source
Refactor
Navigate
Search
Project
Run
Window
Help
Quick Access
Java EE
Web
Git
Debug
Servers
Variables
Breakpoints
IBM Mobile Starter Kit - Barebone Templates
ServiceAPI.java
Outline

```
LibertyJaxRsServerFactoryBean.performInvocation(Exchange, Object, Method, Object[]) line: 607
LibertyJaxRsInvoker.performInvocation(Exchange, Object, Method, Object[]) line: 114
LibertyJaxRsInvoker(AbstractInvoker).invoke(Exchange, Object, Method, List<Object>) line: 97
LibertyJaxRsInvoker.invoke(Exchange, Object, Method, List<Object>) line: 195
LibertyJaxRsInvoker(JAXRSInvoker).invoke(Exchange, Object, Object) line: 200
LibertyJaxRsInvoker.invoke(Exchange, Object, Object) line: 366
LibertyJaxRsInvoker(JAXRSInvoker).invoke(Exchange, Object) line: 99
ServiceInvokerInterceptor$1.run() line: 61
ServiceInvokerInterceptor.handleMessage(Message) line: 99
PhaseInterceptorChain.doIntercept(Message) line: 307
ChainInitiationObserver.onMessage(Message) line: 124
ServletDestination(AbstractHTTPDestination).invoke(ServletConfig, ServletContext, HttpServletRequest, HttpS
JaxRsWebEndpointImpl(AbstractJaxRsWebEndpoint).invoke(HttpServletRequest, HttpServletResponse) line: 13
IBMRestServlet.handleRequest(HttpServletRequest, HttpServletResponse) line: 149
IBMRestServlet.doPost(HttpServletRequest, HttpServletResponse) line: 107
IBMRestServlet(HttpServlet).service(HttpServletRequest, HttpServletResponse) line: 707
IBMRestServlet.service(ServletRequest, ServletResponse) line: 99
```

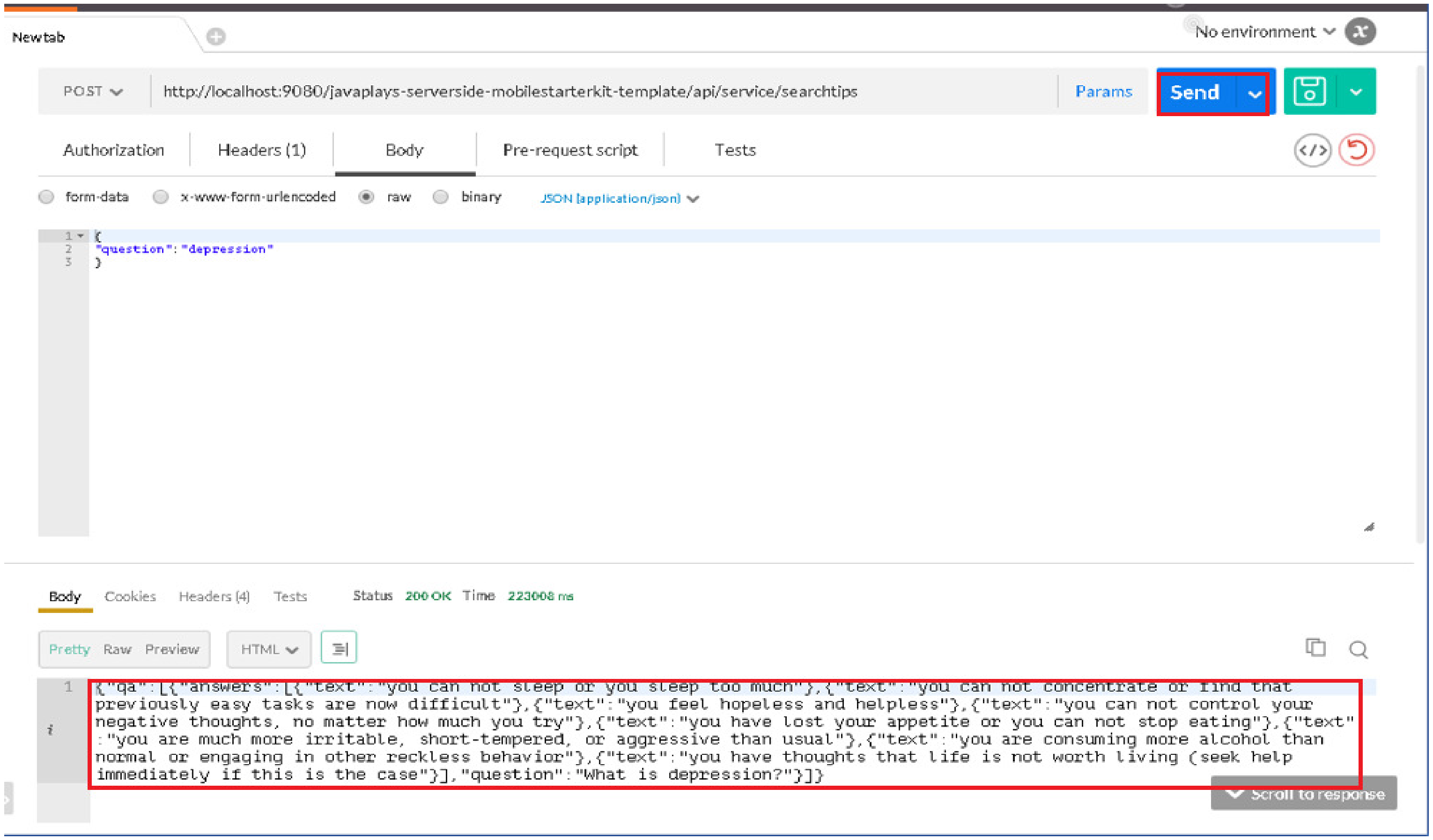
Name	Value
this	ServiceAPI (id=245)
keyword	"{\r\n"question":"depression"\r\n} " (id=260)
QandAList	null
keywordObj	JSONObject (id=265)
question	"depression" (id=267)
responseJSON	JSONObject (id=268)
questionandasnwer	JSONObject (id=269)
answerArray	JSONArray (id=270)
answers	JSONObject (id=275)
qanda	JSONArray (id=278)

```
{"answers":[{"text":"you can not sleep or you sleep too much"},{"text":"you can not concentrat
```

```
                JSONArray qanda = new JSONArray();
                qanda.put( questionandasnwer );

                responseJSON.put("qa", qanda);
                return responseJSON.toString();
```

```
com.ibm.bluemix.mobilestarterkit.service
  > ServiceAPI
      checkLogin(String) : String
      searchTips(String) : String
```

❑Output – loading icon turns to ***Send*** button, and results displayed



```
http://localhost:9080/javaplays-serverside-mobilestarterkit-template/api/service/searchtips
```

```
{
"question":"depression"
}
```

Status 200 OK Time 223008 ms

```
{"qa":[{"answers":[{"text":"you can not sleep or you sleep too much"},{"text":"you can not concentrate or find that
previously easy tasks are now difficult"},{"text":"you feel hopeless and helpless"},{"text":"you can not control your
negative thoughts, no matter how much you try"},{"text":"you have lost your appetite or you can not stop eating"},{"text"
:"you are much more irritable, short-tempered, or aggressive than usual"},{"text":"you are consuming more alcohol than
normal or engaging in other reckless behavior"},{"text":"you have thoughts that life is not worth living (seek help
immediately if this is the case"}],"question":"What is depression?"}]}
```

Summary

In this lab, you learned how to enable remote development mode, which allows incremental pushes to Bluemix server using the **Eclipse Bluemix Plugin**. The same can be achieved by using DevOps to edit, commit, build and deploy the changes.

We also learned to start the local WebSphere Liberty server in debug mode, which allows us to trace errors by validating every single available variable.

Remote debugging in Bluemix server work in a similar way. We need to **Enable application debug**, a menu available when you right click on Bluemix server, in **Servers** view. For more information, please refer to the link below:

https://www.ng.bluemix.net/docs/manageapps/eclipsetools/eclipsetools.html

This ends the Eclipse Lab 3 Local Debugging and Remote Development

Thank you !