IBM VAADIN CHALLENGE

LAB → VAADIN – BLUEMIX – WATSON SAMPLE APP

Presented by:

IBM EcoD

IBM Cloud

VAADIN – BLUEMIX – WATSON HEALTHCARE SAMPLE APP

http://vaadin-watson-healthcare.mybluemix.net/

WELCOME TO IBM VAADIN CHALLENGE

VAADIN BLUEMIX WATSON HEALTHCARE SERVICES SAMPLE PPLLICATION

Headache

Ask Watson about a Health Symptom?

What is "Headache"?

id	answer
1	Symptoms of flu include: fever (usually high). headache. extreme tiredness. dry cough. sore throat. runny or stuffy nose. muscle aches. Stomach symptoms, such as nausea, vomiting, and diarrhea, also can occur but are more common in children than adults. Although the term 'stomach flu' is sometimes used to describe vomiting, nausea, or diarrhea, these illnesses are caused by certain other viruses, bacteria, or possibly parasites, and are rarely related to influenza.
2	Therefore, workers should be educated on the need to prevent the spread of influenza viruses from ill persons to pigs. Workers also should be trained to recognize influenza-like illness signs and symptoms in humans. These include fever, cough, sore throat, runny or stuffy nose, body aches, headache, chills, fatigue, and possibly vomiting or diarrhea. A worker who has been diagnosed with influenza, or has similar influenza-like illness symptoms, or reports contact with others who have similar illness (listed above) should avoid contact with pigs.
3	In clinical treatment studies of persons with uncomplicated influenza, the frequencies of adverse events were similar for persons receiving inhaled zanamivir and for those receiving placebo (i.e., inhaled lactose vehicle alone) [15, 16, 142]. The most common adverse events reported by both groups were diarrhea, nausea, sinusitis, nasal signs and symptoms, bronchitis, cough, headache, dizziness, and ear, nose, and throat infections. Each of these symptoms was reported by less than 5% of persons in the clinical treatment studies combined [156]. Inhaled zanamivir does not impair the immunologic response to TIV [224].
4	Instruct workers to watch for influenza-like illness signs and symptoms for 7 days after exposure to pigs that are suspected or known to be ill with influenza. The signs and symptoms of illness caused by swine influenza A virus infection in people are similar to the signs and symptoms of seasonal influenza. These can include fever, cough, sore throat, runny or stuffy nose, body aches, headache, chills, fatigue, and possibly diarrhea and vomiting. Employers should consider making arrangements for appropriate medical follow up and treatment so that ill workers can take the following steps: Notify their supervisor and their employer's health and safety representative that they are ill.

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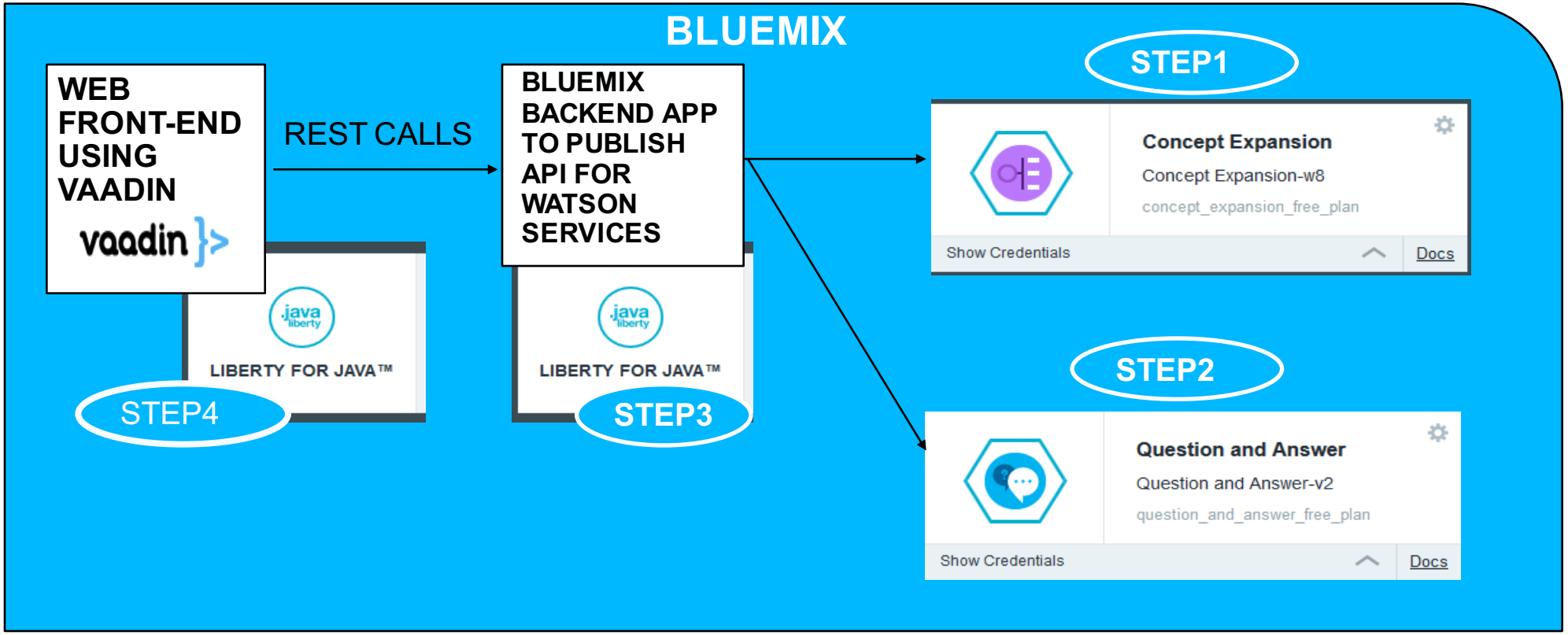
VAADIN – BLUEMIX – WATSON SAMPLE APP → LOGICAL FLOW → STEPS FOR THE LAB



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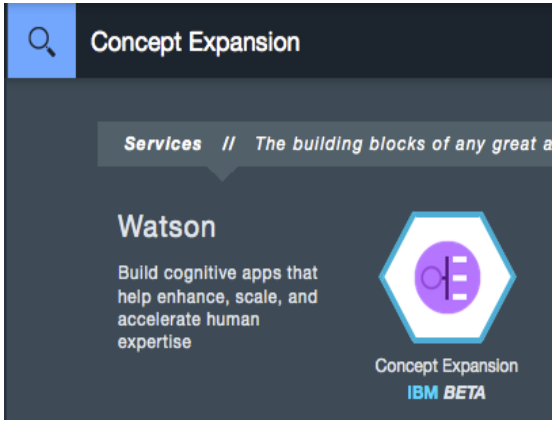
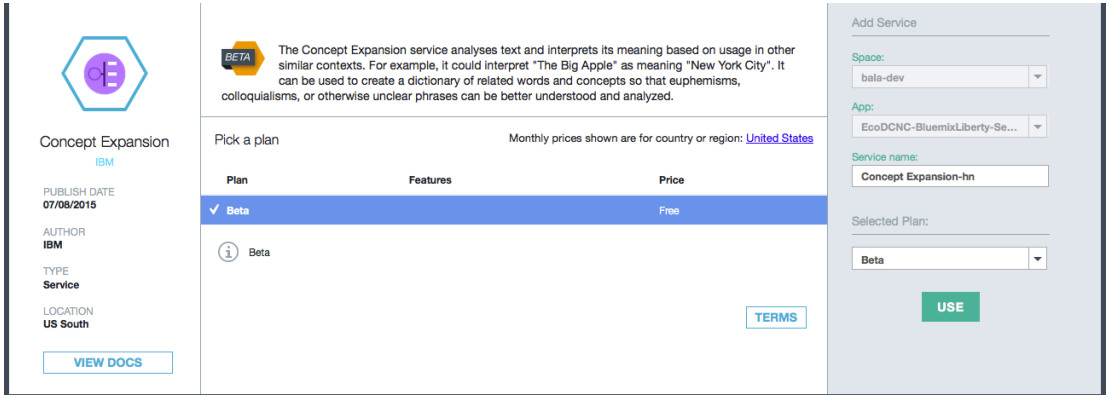
STEP 1 – Create Watson Concept Expansion Service in Bluemix

- Login to Bluemix → Select Catalog → Search Concept Expansion→ Click Create





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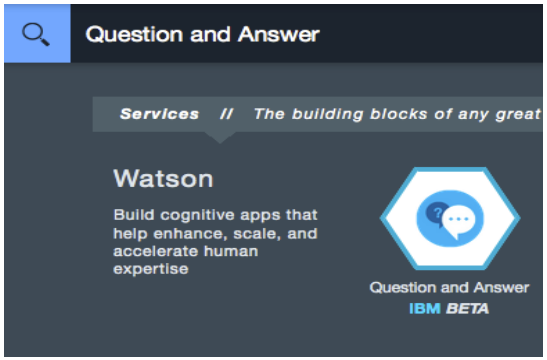
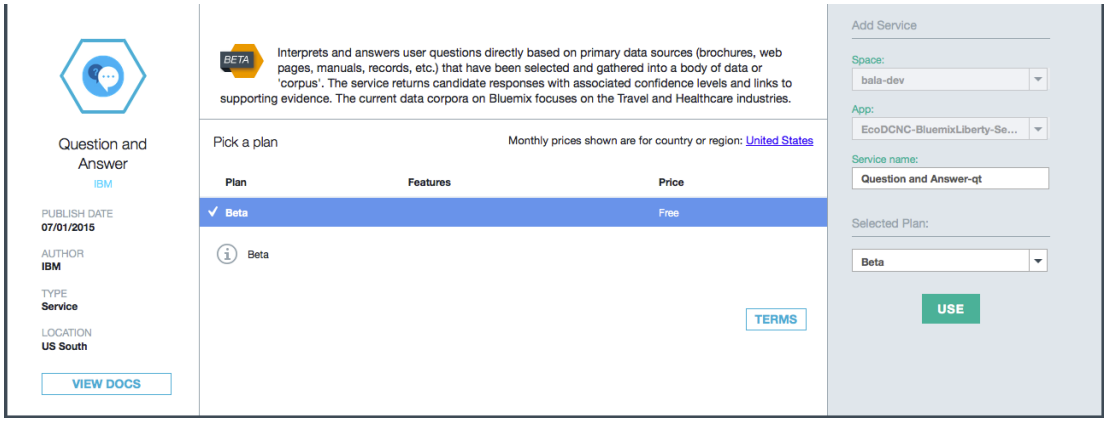
STEP 2 – Create Watson Question and Answer Service in Bluemix

- Login to Bluemix → Select Catalog → Search Watson Q and A→ Click Create



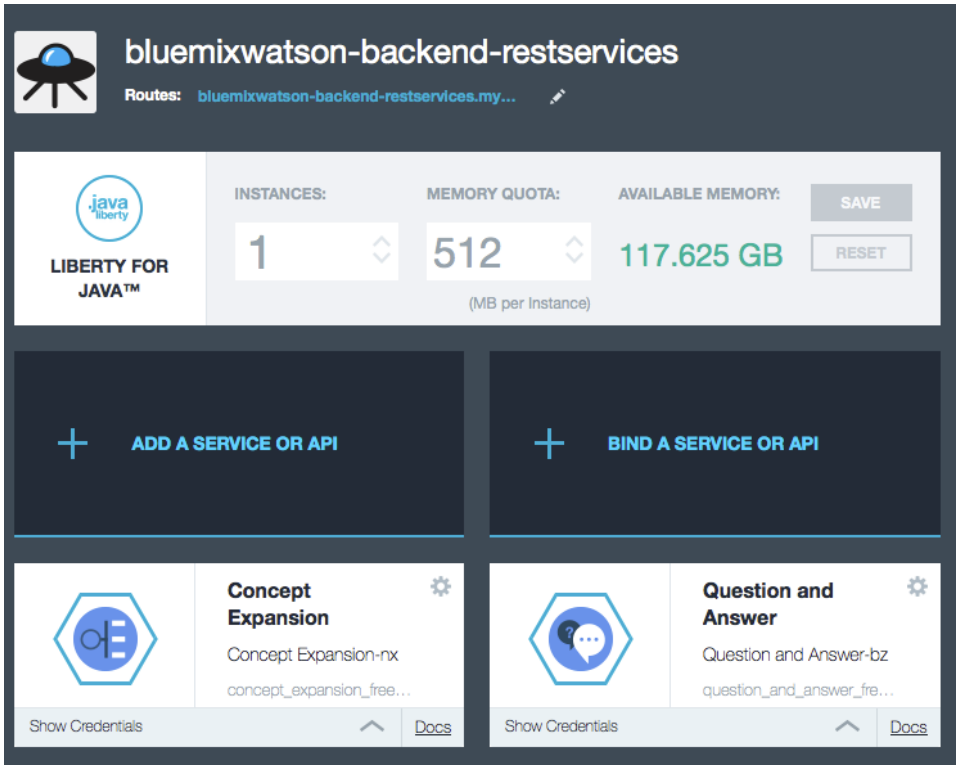


STEP 3 – CREATE AND DEPLOY BLUEMIX RESTFUL SERVICES WATSON APP via COMMAND LINE

- Download the war file from
  - https://github.com/ibmecod/javaplays-rest-watsonservices/blob/master/jprestjavafullmsk.war
- Login to Bluemix via cmdline
  - cf login <endpoint> (Example:https://api.ng.bluemix.net)
  - Select the space in Bluemix
- Push the application to Bluemix
  - cf push <appname> -p jprestjavafullmsk.war (appname → can be anyname you want to name your application. Example : bluemixwatson-backend-restservices)

STEP 3 – DEPLOY BLUEMIX RESTFUL SERVICES WATSON APP via COMMAND LINE – Cont'd

Open Bluemix Admin Console → Click on the application Deployed →Bind the Services configured in Step1 and 2 → For this application



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STEP 3 – DEPLOY BLUEMIX RESTFUL SERVICES WATSON APP via COMMAND LINE – Cont'd

- Get the name of the route from Bluemix after the application is started → Ready TO GO !!!
- Note down the URL for use in Step 4
  - Sample Application URL for Backend - http://bluemixwatson-backend-restservices.mybluemix.net/
- Review, Change, Deploying the code → Follow the steps in Appendix A and B sections below

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STEP 4 – CREATE AND PUSH VAADIN USER INTERFACE APPLICATION TO BLUEMIX

- Download the war file from
  - https://github.com/ibmecod/vaadin/blob/master/vaadin-bluemixwatson.war
- Login to Bluemix via cmdline
  - cf login <endpoint>, Select the space in Bluemix
- Push the application to Bluemix
  - cf push <appname> -p vaadin-bluemixwatson.war
- Get the name of the route from Bluemix after the application is started → Ready TO GO !!!

http://<appname>.mybluemix.net

Sample Application URL - http://vaadin-watson-healthcare.mybluemix.net/

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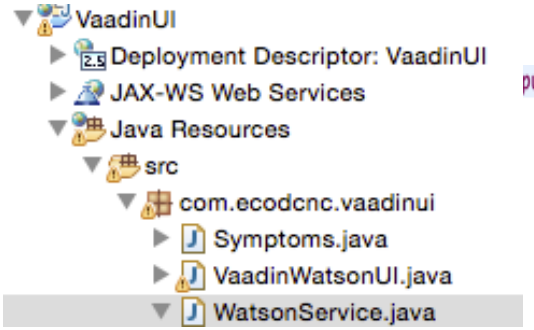
STEP 4 (Not Mandatory) – Review, Change and Deploy the Code

- Import the code from Github
  - https://github.com/ibmecod/vaadin.git → vaadinUI-bluemixwatson-app
- Import the project in to Eclipse à Open WatsonServices.java → Update the URL with BackEnd REST Services URL mentioned in Step 3




```
public class WatsonService {

    private static final String targetURL = "http://bluemixwatson-backend-restservices.mybluemix.net/api/service/searchtips/";
    String response;

    public String getResponseFromBluemixWatson(String forminput) {
            try {
```

- Code Walkthrough → Vaadin UI → Appendix C

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APPENDIX A – BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON – PULL THE CODE TO ECLIPSE

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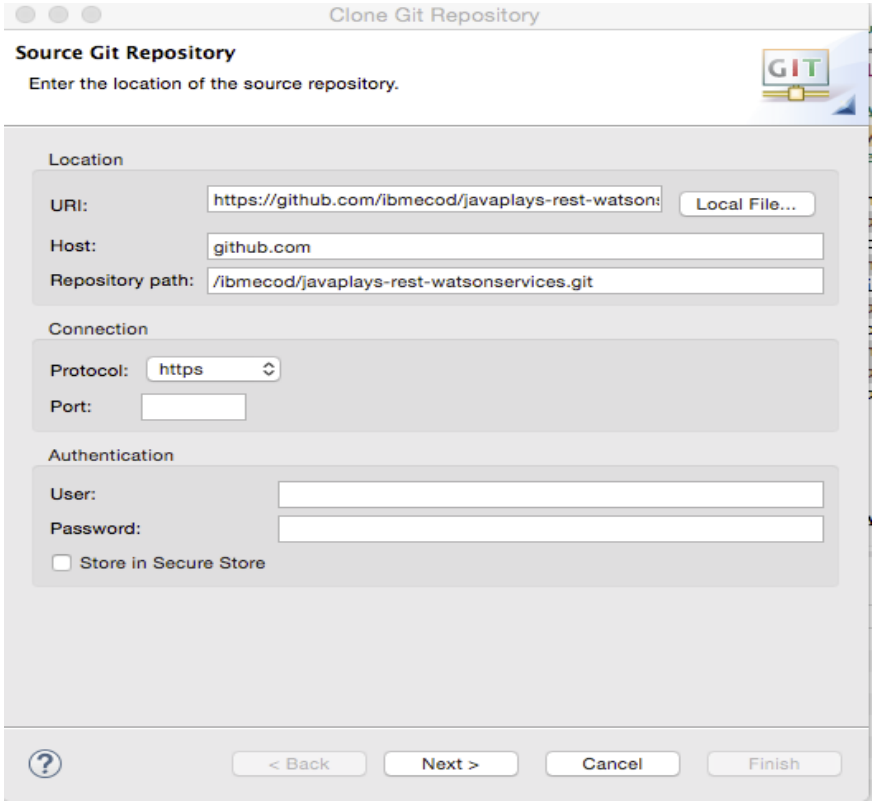
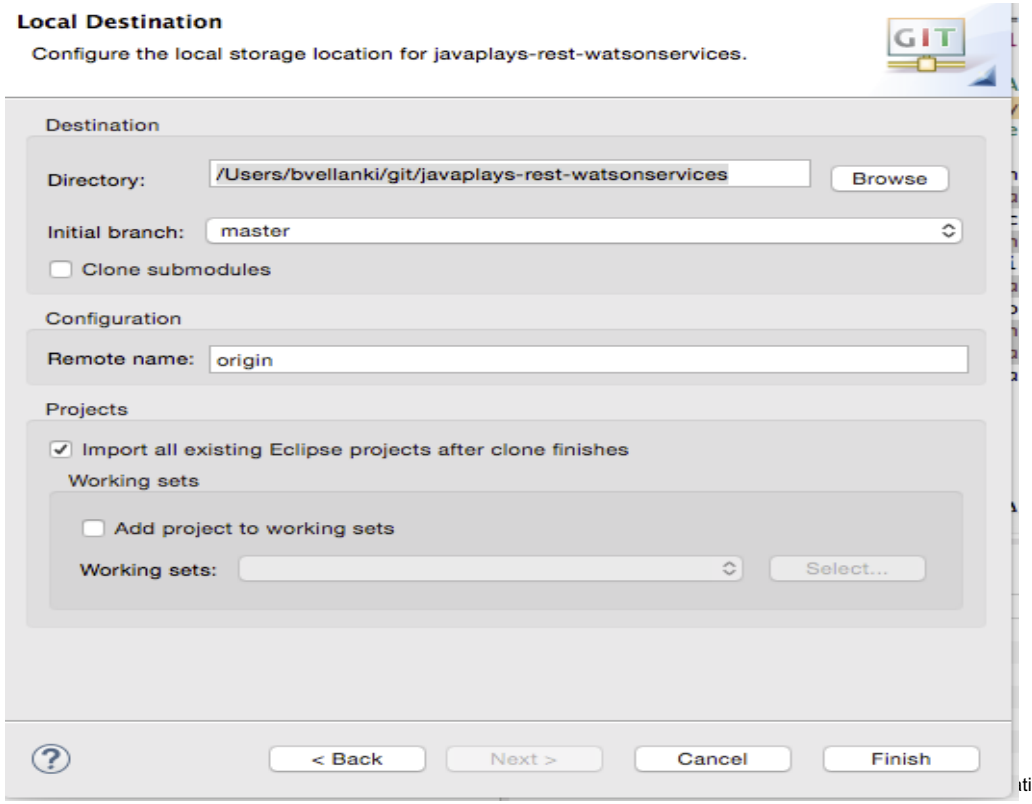
APPENDIX A - BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON

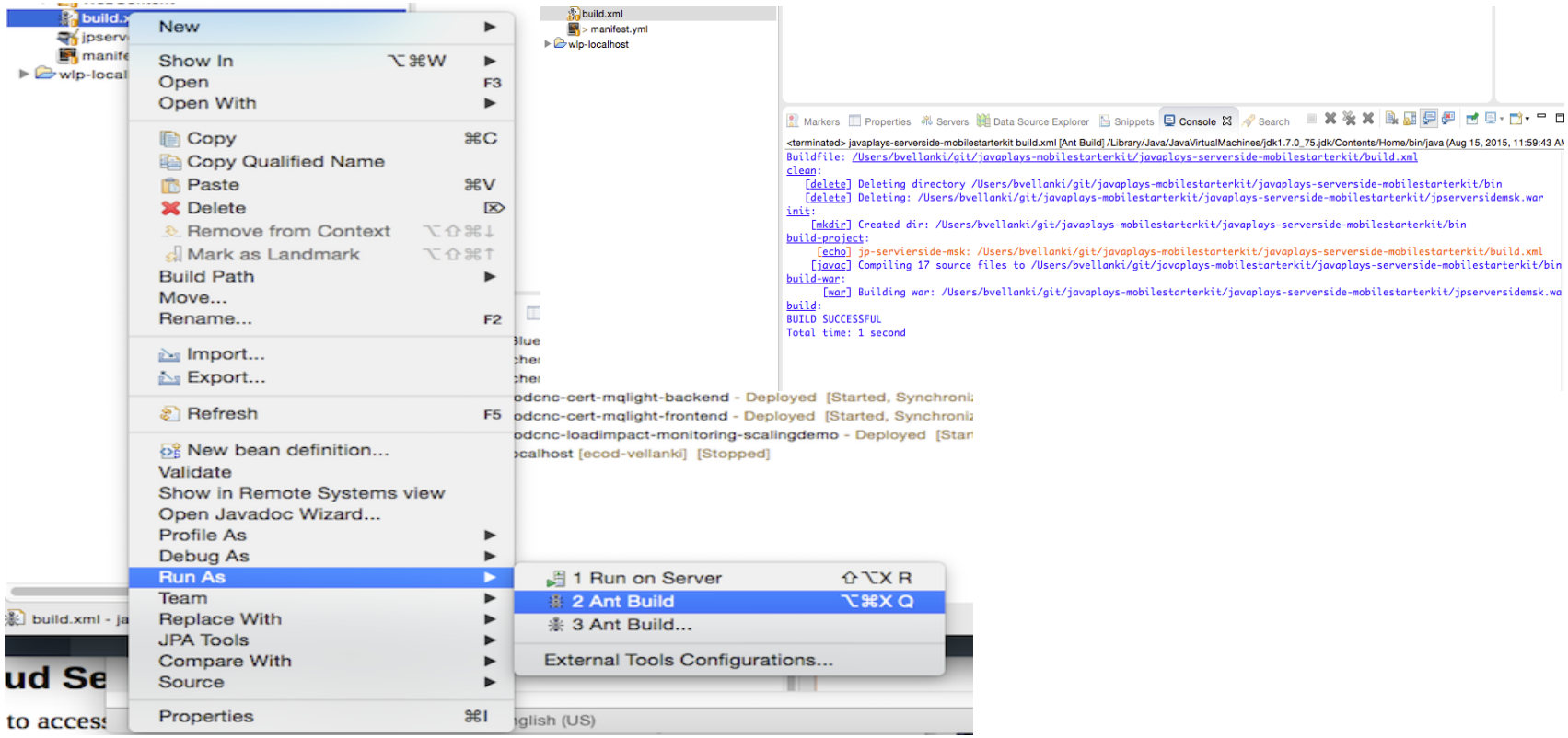
- **Import the Code from Git in to your eclipse workspace for development**
  - https://github.com/ibmecod/javaplays-rest-watsonservices.git





APPENDIX A - BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON

- Build.xml →Run the Ant Build



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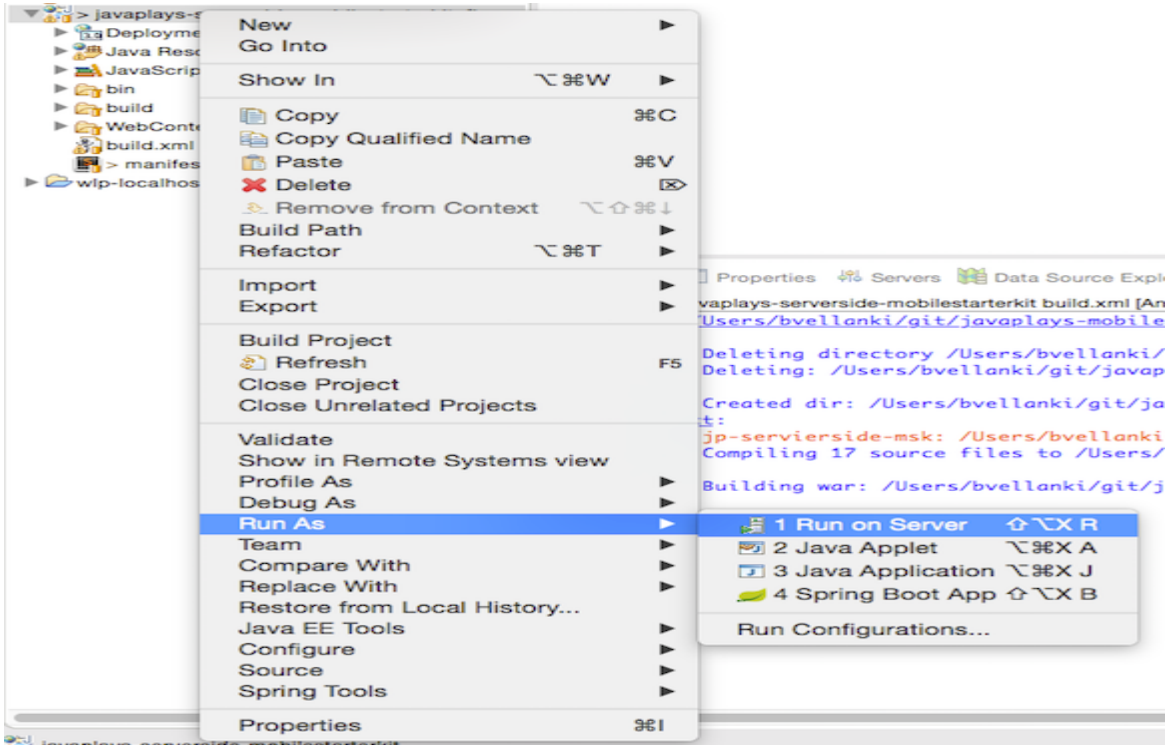
APPENDIX A - BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON

STEP 1:

Deploy the application to Bluemix from Eclipse



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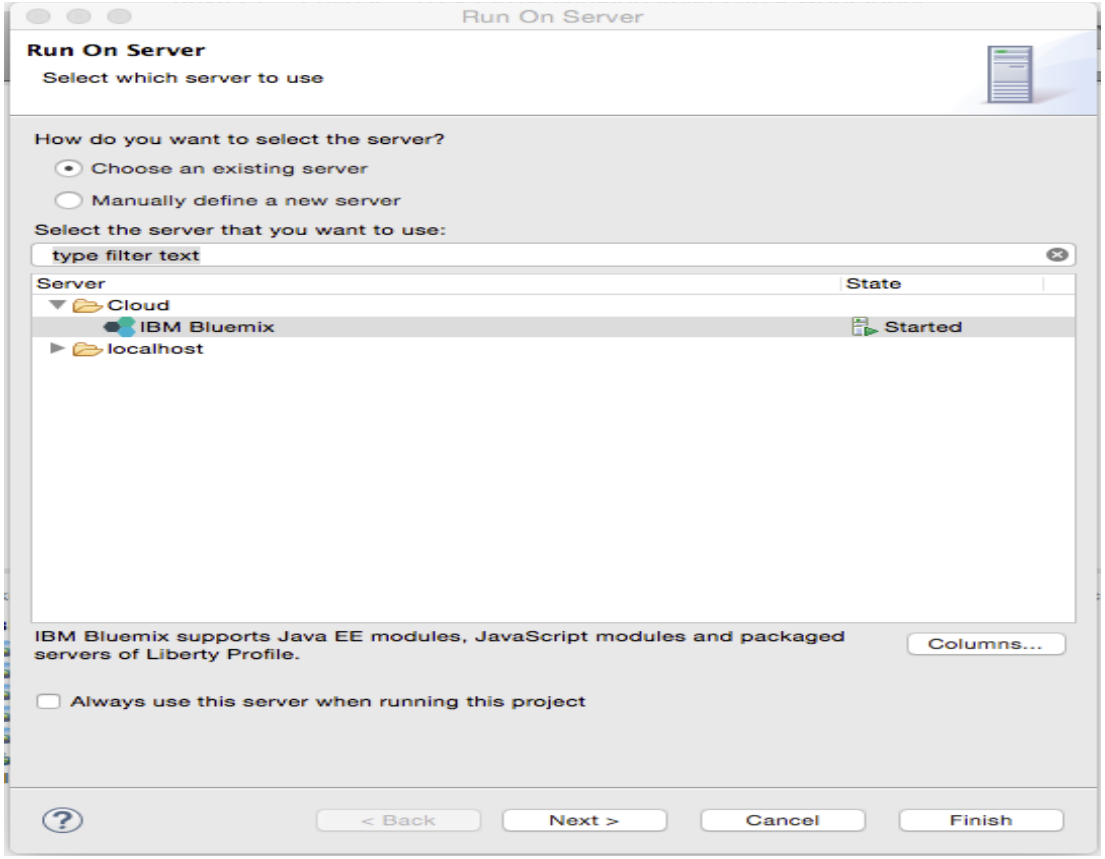
APPENDIX A - BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON

STEP 2:

Deploy the application to Bluemix from Eclipse



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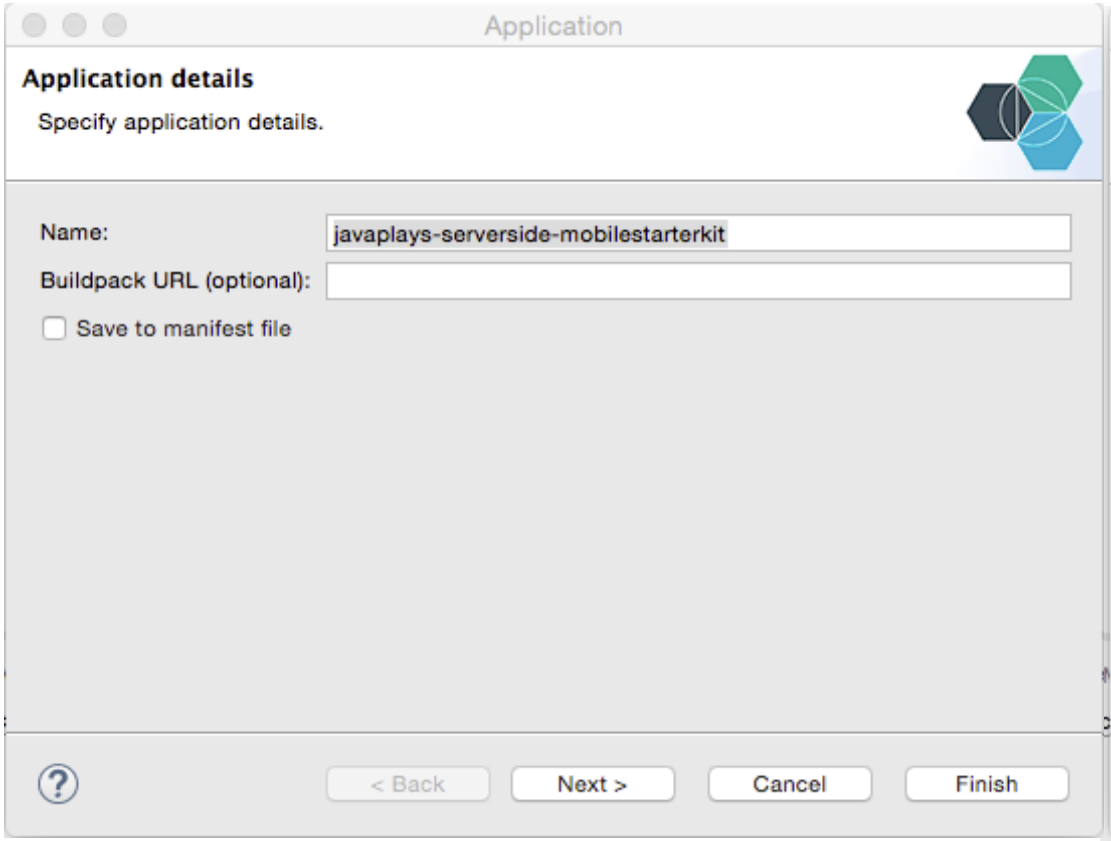
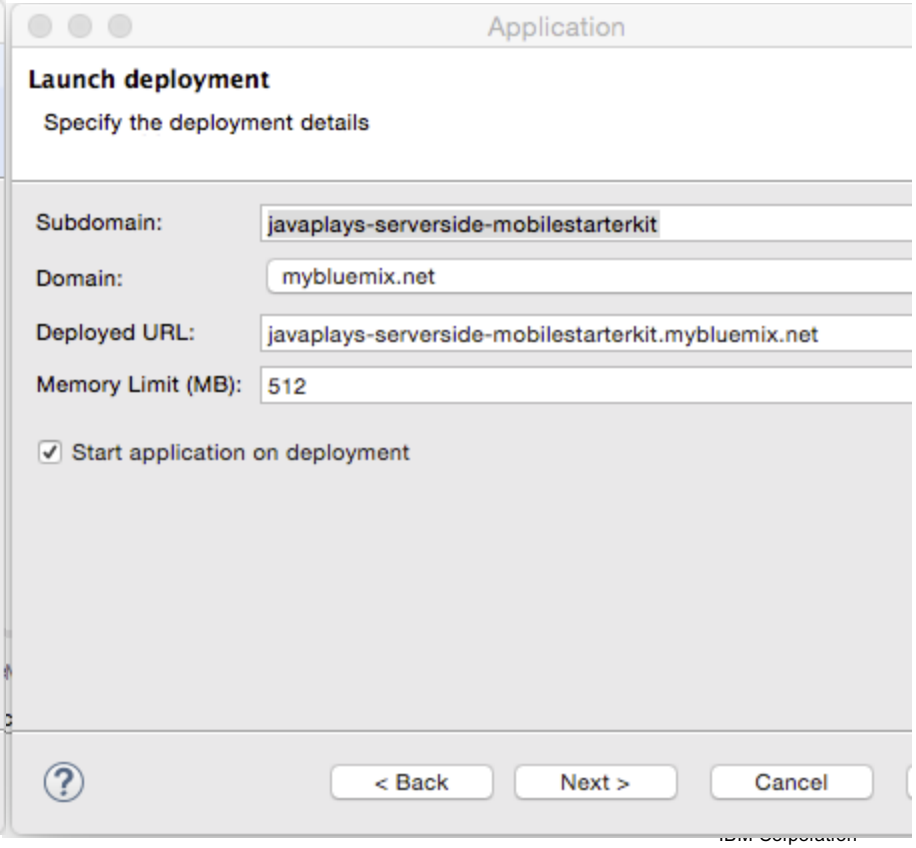
APPENDIX A - BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON

STEP 3: Deploy the application to Bluemix from Eclipse – Step3

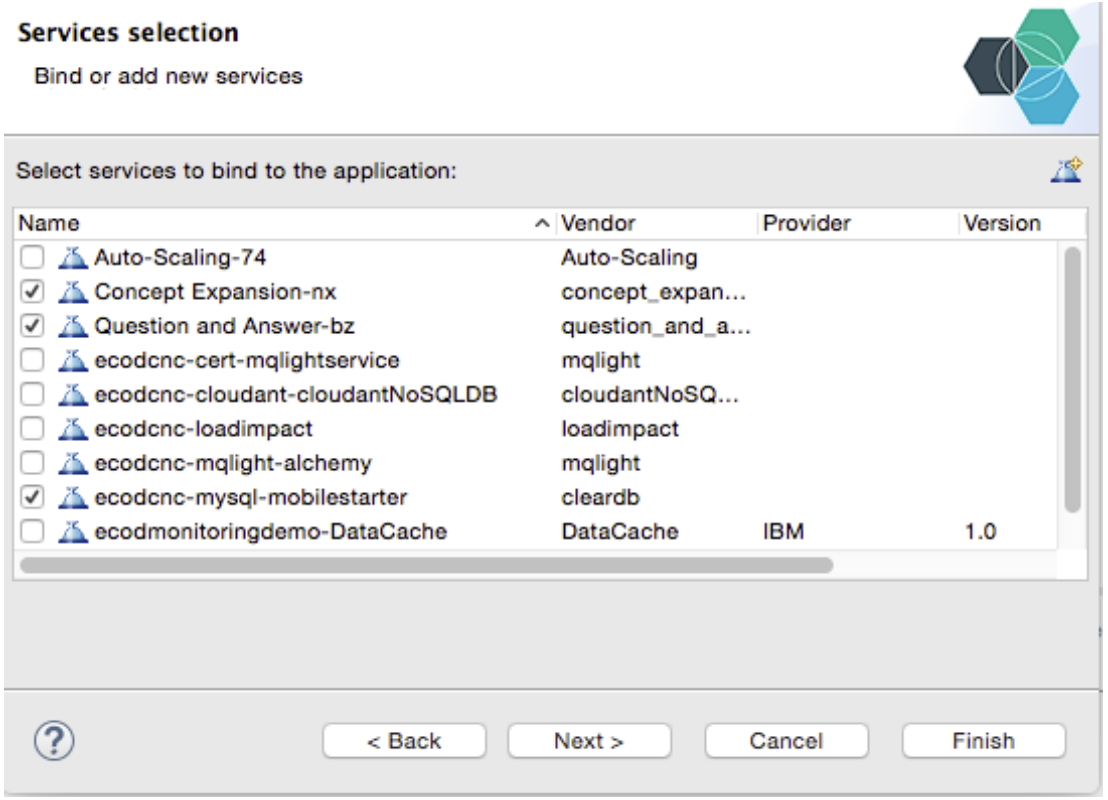




APPENDIX A - BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON

STEP 4:

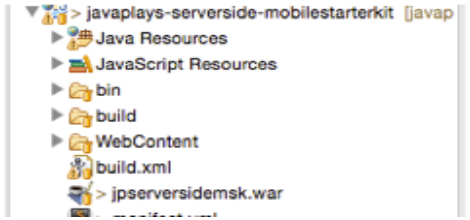
Deploy the application to Bluemix from Eclipse – Configure Services for the application → Select Services shown



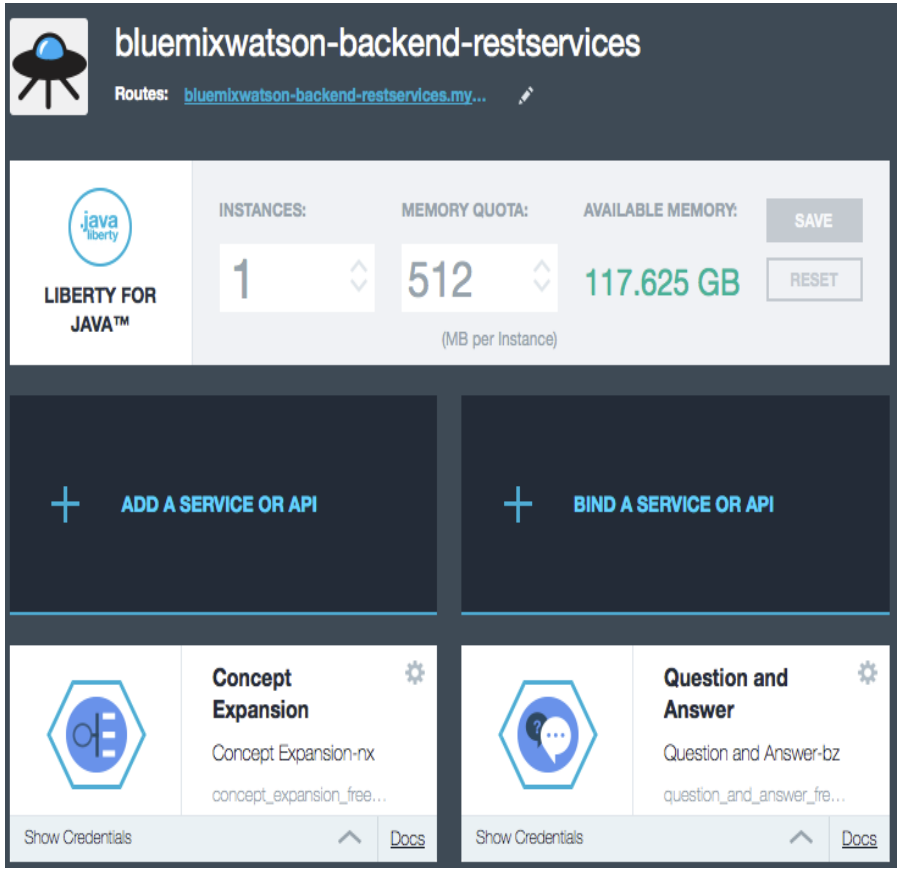
STEP 4 – APPENDIX A - BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON

STEP 4:

Deploy the application to



STEP 4 – BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON



APPENDIX B – CODE WALKTHROUGH - BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON

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Bluemix Watson Backend Application – How to READ VCAP Environment Variables

- ServiceDiscovery.java – Read VCAP environment variables

```
public void processVCAP() {

    String MySQL_Service_Name = "cleardb";
    String WatsonConceptExpansion_Service_Name = "concept_expansion";
    String WatsonQandA_Service_Name = "question_and_answer";

    // VCAP_SERVICES is a system environment variable
    // Parse it to obtain the for DB2 connection info
    String VCAP_SERVICES = System.getenv("VCAP_SERVICES");
    if (VCAP_SERVICES != null) {
        // parse the VCAP JSON structure
        BasicDBObject obj = (BasicDBObject) JSON.parse(VCAP_SERVICES);
        String thekey = null;
        Set<String> keys = obj.keySet();
        // Look for the VCAP key that holds the SQLDB information
        for (String eachkey : keys) {
            // Just in case the service name gets changed to lower case in
            // the future, use toUpperCase
            if (eachkey.contains(MySQL_Service_Name)) {
                thekey = eachkey;
                getDBConnectionParams(thekey, obj);
            } else if (eachkey
                    .contains(WatsonConceptExpansion_Service_Name)) {
                thekey = eachkey;
                getWatsonConceptExpansionParams(thekey, obj);
            } else if (eachkey.contains(WatsonQandA_Service_Name)) {
                thekey = eachkey;
                getWatsonQandAParams(thekey, obj);
            }
        }
    }
}
```

Service Discovery class → com.ibm.bluemix.startkit.services

- The process VCAP method in the service class reads all the VCAP environment various defined for that application.
- There are three services configured in Bluemix for this application
  - Concept Expansion
  - Question and Answer

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Bluemix Watson Backend Application – Connect to Services

- Service Discovery.java – Read Bluemix Services environment variables

```
private void getWatsonQandAParams(String qakey, BasicDBObject vcapobj) {

    BasicDBList qadblist = (BasicDBList) vcapobj.get(qakey);
    vcapobj = (BasicDBObject) qadblist.get("0");
    // parse all the credentials from the vcap env variable
    vcapobj = (BasicDBObject) vcapobj.get("credentials");

    setQAURL((String) vcapobj.get("url"));
    setQAUserName((String) vcapobj.get("username"));
    setQAPassword((String) vcapobj.get("password"));

}

private void getWatsonConceptExpansionParams(String cekey,
        BasicDBObject vcapobj) {

    BasicDBList cedblist = (BasicDBList) vcapobj.get(cekey);
    vcapobj = (BasicDBObject) cedblist.get("0");
    // parse all the credentials from the vcap env variable
    vcapobj = (BasicDBObject) vcapobj.get("credentials");
    setCEURL((String) vcapobj.get("url"));
    setCEUserName((String) vcapobj.get("username"));
    setCEPassword((String) vcapobj.get("password"));
}

@SuppressWarnings("unchecked")
public void getDBConnectionParams(String mysqldbkey, BasicDBObject vcapobj) {

    BasicDBList mysqldblist = (BasicDBList) vcapobj.get(mysqldbkey);
    vcapobj = (BasicDBObject) mysqldblist.get("0");
    // parse all the credentials from the vcap env variable
    vcapobj = (BasicDBObject) vcapobj.get("credentials");
    setDBHostName((String) vcapobj.get("hostname"));
    setDBName((String) vcapobj.get("name"));
    setDBPort((String) vcapobj.get("port"));
    setDBUser((String) vcapobj.get("username"));
    setDBPassword((String) vcapobj.get("password"));

}
```

- getWatsonQandAParams → This method retrieves all the VCAP environment variables available for Watson Q and A Service in Bluemix
- getWatsonConceptExpansionParams → This method retrieves all the VCAP environment variables available for Watson Concept Expansion Service in Bluemix
- getDBConnectionParams → This method retrieves all the VCAP environment variables available for Clear MySQL DB Service in Bluemix

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Bluemix Watson Backend Application – Register New User REST Service

- searchtips REST Service

```
@Path("/searchtips")
@POST
public String searchTips( String params ){

    org.json.JSONObject paramObj = null;

    SearchTipsTask csd = new SearchTipsTask(  );

    csd.createCEService( _ceBaseURL, _ceUsername, _cePassword );
    csd.createQAService( _qaBaseURL, _qaUsername, _qaPassword );


    try{


        paramObj = new JSONObject( params );

        String keyword      = paramObj.getString( "keyword" );
        String searchResult = csd.runSteps( keyword );

        //System.out.println( searchResult );
        return searchResult;

    }
```

- /searchtips REST Call →
  - This rest call communicates with Watson Concept Expansion and Watson Q and A service for the input passed in to the mobile application search screen
  - This call parses and converts the output from the watson services to JSON format
  - The JSON format output will passed as an output to the /searchtips rest call.
  - The results are displayed on the Vaadin UI Screen

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APPENDIX C – CODE WALKTHROUGH – VAADIN UI – FRONT END APPLICATION

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VAADIN UI – Build UI

- VaadinWatsonUI Code

```
34 import com.vaadin.ui.VerticalLayout;
35 import com.vaadin.ui.themes.ValoTheme;
36
37
38 @PreserveOnRefresh
39 @Title("VaadinUI")
40 @Theme("vaadinui")
41
42 public class VaadinWatsonUI extends UI {
43
44     TextField postQuestionText = new TextField();
45     Button postQ = new Button("Ask Watson about a Health Symptom?");
46     String basepath = VaadinService.getCurrent().getBaseDirectory().getAbsolutePath();
47     // Show the image in the application
48     FileResource resource = new FileResource(new File(basepath + "/WEB-INF/images/iconNoCommunityPhoto155.png"));
49     Image image = new Image(null, resource);
50     WatsonService ws = new WatsonService();
51     WatsonResponse wresp = new WatsonResponse();
52     VerticalLayout vlayout = null;
53     Table table1;
54     Table table2;
55
56
57     @Override
58     protected void init(VaadinRequest request) {
59         FormLayout formLayout = new FormLayout();
60         postQ.setStyleName(ValoTheme.BUTTON_PRIMARY);
61         postQ.setClickShortcut(ShortcutAction.KeyCode.ENTER);
62         HorizontalLayout hlayout = new HorizontalLayout(postQ);
63         HorizontalLayout head = new HorizontalLayout();
64         head.addComponent(new Label("WELCOME TO IBM VAADIN CHALLENGE"));
65         head.setWidth("500px");
66         HorizontalLayout head1 = new HorizontalLayout();
67         head1.addComponent(new Label("VAADIN BLUEMIX WATSON HEALTHCARE SERVICES SAMPLE PPLLICATION"));
68         head1.setWidth("700px");
69         hlayout.setSpacing(true);
70         postQuestionText.setImmediate(true);
71         postQuestionText.setInputPrompt("Example: Depression");
72         postQuestionText.setWidth("500px");
73         formLayout.addComponents(image, head, head1, postQuestionText, hlayout);
74         setVisible(true);
75
76         postQ.addClickListener(new Button.ClickListener() {
```

VaadinWatsonUI class → com.ecodcnc.vaadinui.VaadinWatsonUI

This class builds the Vaadin UserInterface uisng different layouts

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VAADIN UI – Talk to Backend Services and Parse

- WatsonService Code →

```
public class WatsonService {

    private static final String targetURL = "http://bluemixwatson-backend-restservices.mybluemix.net/api/service/searcht
    String response;

    public String getResponseFromBluemixWatson(String forminput) {
            try {

            URL restServiceURL = new URL(targetURL);

            HttpURLConnection conn = (HttpURLConnection) restServiceURL.openConnection();
            conn.setDoOutput(true);
            conn.setRequestMethod("POST");
            conn.setRequestProperty("Accept", "application/json");

            String input = "{\"keyword\"" + ":"  + forminput + "}";

            OutputStream os = conn.getOutputStream();
            os.write(input.getBytes());
            os.flush();
            String output;
            if (conn.getResponseCode() != 200) {
                throw new RuntimeException("HTTP GET Request Failed with Error code :" + conn.getResponseCode());
            }

            BufferedReader br = new BufferedReader(new InputStreamReader((conn.getInputStream())));

            System.out.println("Output from Server .... \n");
            while ((output = br.readLine()) != null) {
                setResponse(output.toString());
                System.out.println(output);
            }

            conn.disconnect();

        } catch (MalformedURLException e) {
```

VaadinWatsonUI class → com.ecodcnc.WatsonService

This class make http rest call to Integrate VaadinWatsonUI with the Backend services

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VAADIN – BLUEMIX – WATSON HEALTHCARE SAMPLE APP

http://vaadin-watson-healthcare.mybluemix.net/

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Questions?

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