



# 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

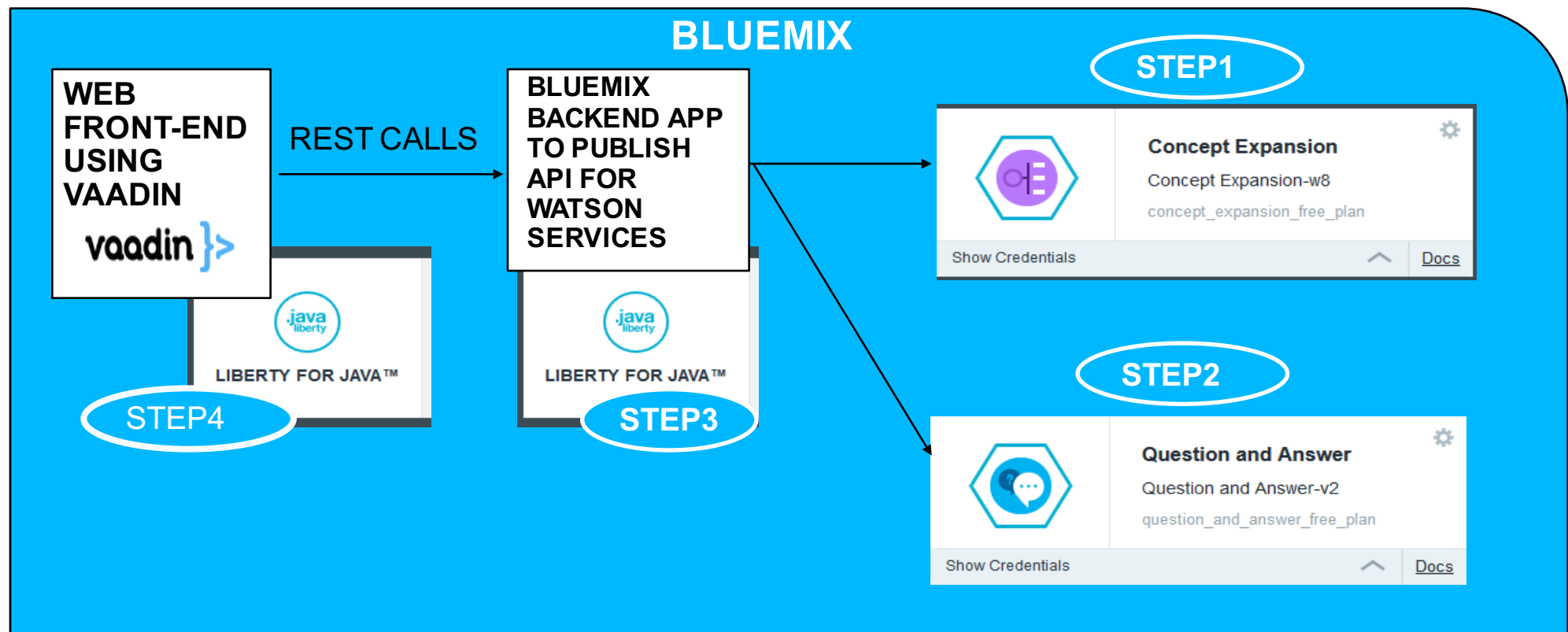
VAADIN BLUEMIX WATSON HEALTHCARE SERVICES SAMPLE PPLICATION

Ask Watson about a Health Symptom?

What is "Headache"?

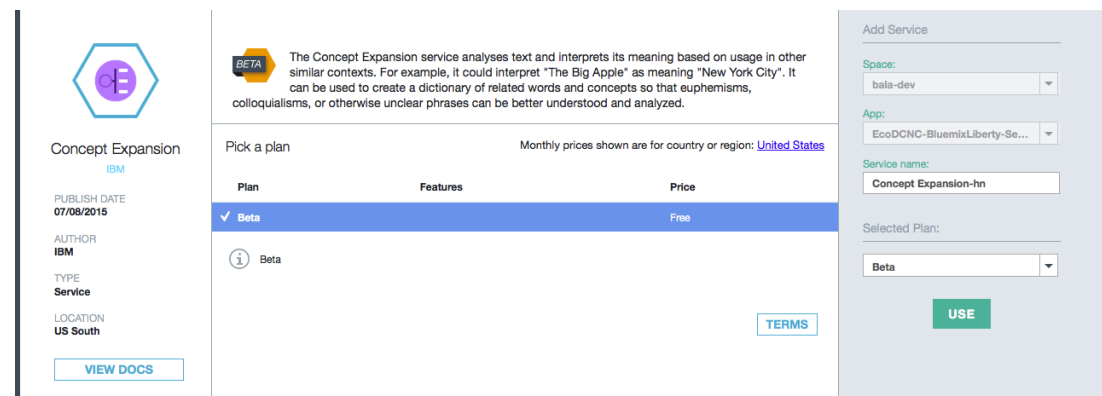
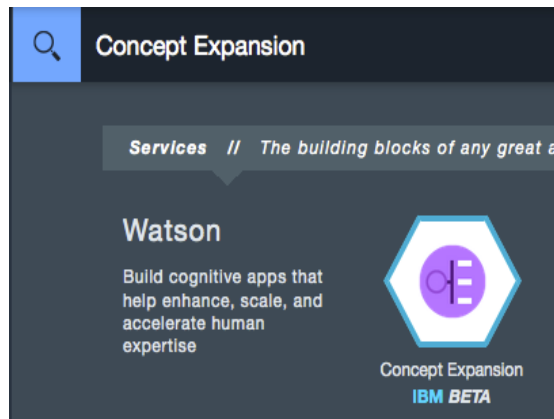
id		answer
1		Symptoms of flu include: fever (usually high), headache, extreme tiredness, dry cough, sore throat, runny or stuffy nose, muscle aches. Stomach symptoms, such as nausea, vomiting, and diarrhea, also can occur but are more common in children than adults. Although the term 'stomach flu' is 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.

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



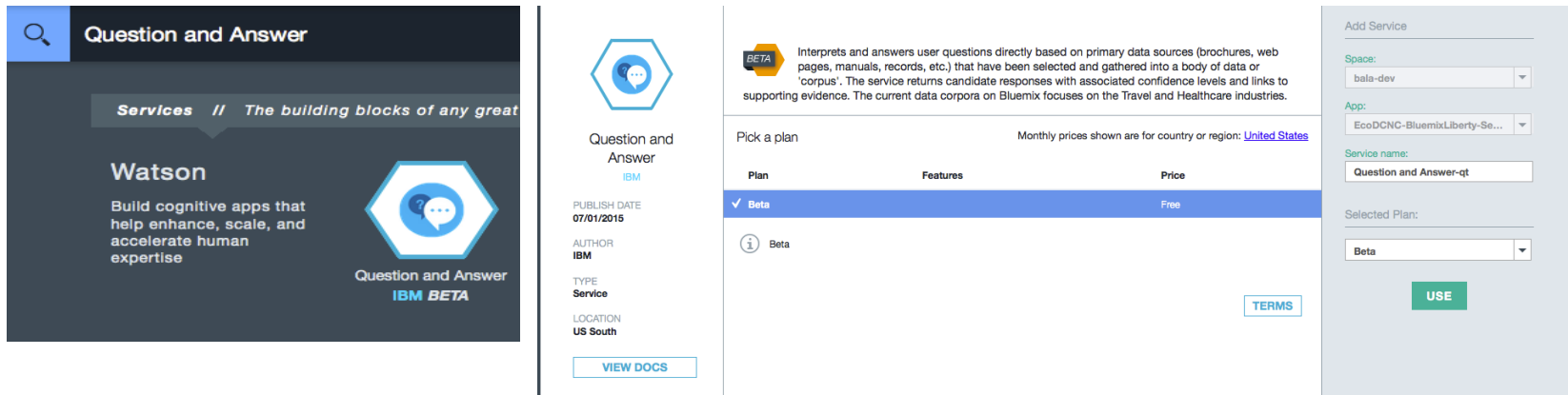
## STEP 1 – Create Watson Concept Expansion Service in Bluemix

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



## STEP 2 – Create Watson Question and Answer Service in Bluemix

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



The screenshot displays the IBM Bluemix console interface for creating a Watson Question and Answer service. The left sidebar shows the 'Question and Answer' service card with the text 'Build cognitive apps that help enhance, scale, and accelerate human expertise' and the 'IBM BETA' logo. The main content area is divided into three sections: a service overview, a plan selection table, and an 'Add Service' sidebar.

**Service Overview:**

- Question and Answer** (IBM BETA)
- PUBLISH DATE:** 07/01/2015
- AUTHOR:** IBM
- TYPE:** Service
- LOCATION:** US South
- [VIEW DOCS](#)

**Plan Selection Table:**

Plan	Features	Price
✓ Beta		Free

**Service Description:** Interprets and answers user questions directly based on primary data sources (brochures, web pages, manuals, records, etc.) that have been selected and gathered into a body of data or 'corpus'. The service returns candidate responses with associated confidence levels and links to supporting evidence. The current data corpora on Bluemix focuses on the Travel and Healthcare industries.

**Monthly prices shown are for country or region: [United States](#)**

**Terms:** [TERMS](#)

**Add Service Sidebar:**

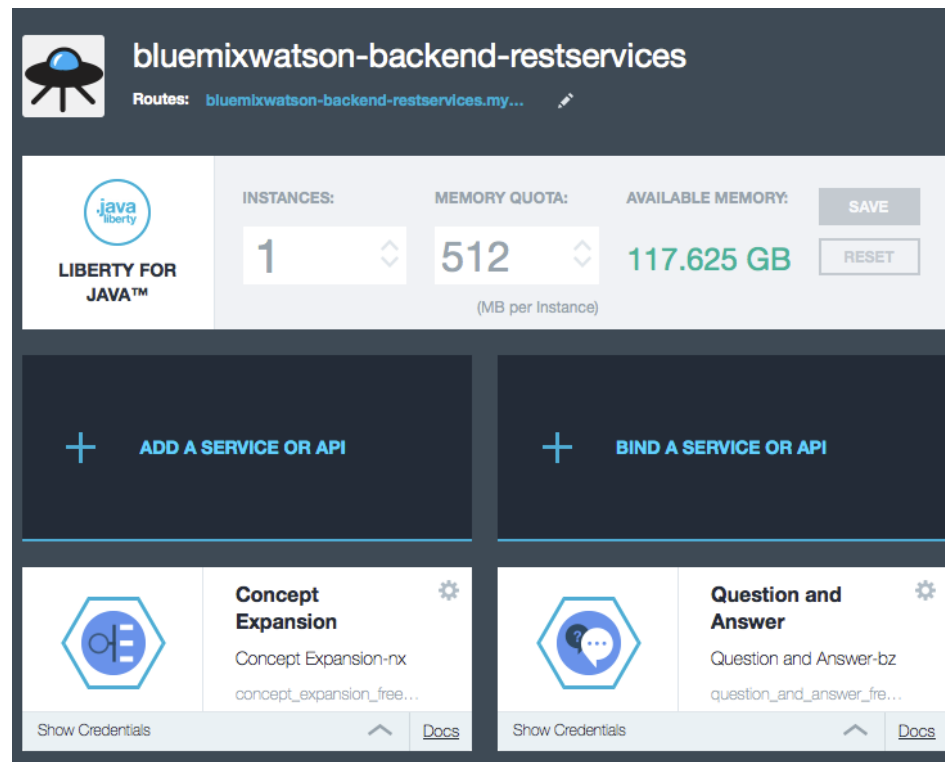
- Space:** bata-dev
- App:** EcoDCNG-BluemixLiberty-Se...
- Service name:** Question and Answer-qt
- Selected Plan:** Beta
- [USE](#)

## 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



The screenshot shows the Bluemix Admin Console interface for an application named "bluemixwatson-backend-restservices". The interface includes a header with the application name and a route. Below this, there is a section for configuration with fields for "INSTANCES" (set to 1), "MEMORY QUOTA" (set to 512 MB), and "AVAILABLE MEMORY" (117.625 GB). There are "SAVE" and "RESET" buttons. Below the configuration section, there are two large buttons: "ADD A SERVICE OR API" and "BIND A SERVICE OR API". At the bottom, there are two service cards: "Concept Expansion" and "Question and Answer". Each card has a "Show Credentials" button and a "Docs" link.

INSTANCES:	MEMORY QUOTA:	AVAILABLE MEMORY:
1	512 (MB per Instance)	117.625 GB

**Services:**

- Concept Expansion**  
Concept Expansion-rx  
concept\_expansion\_fre...  
Show Credentials | Docs
- Question and Answer**  
Question and Answer-bz  
question\_and\_answer\_fre...  
Show Credentials | Docs

## 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**





## 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>

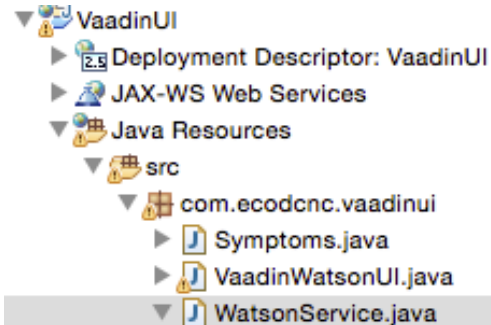
Sample Application URL - <http://vaadin-watson-healthcare.mybluemix.net/>

## 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



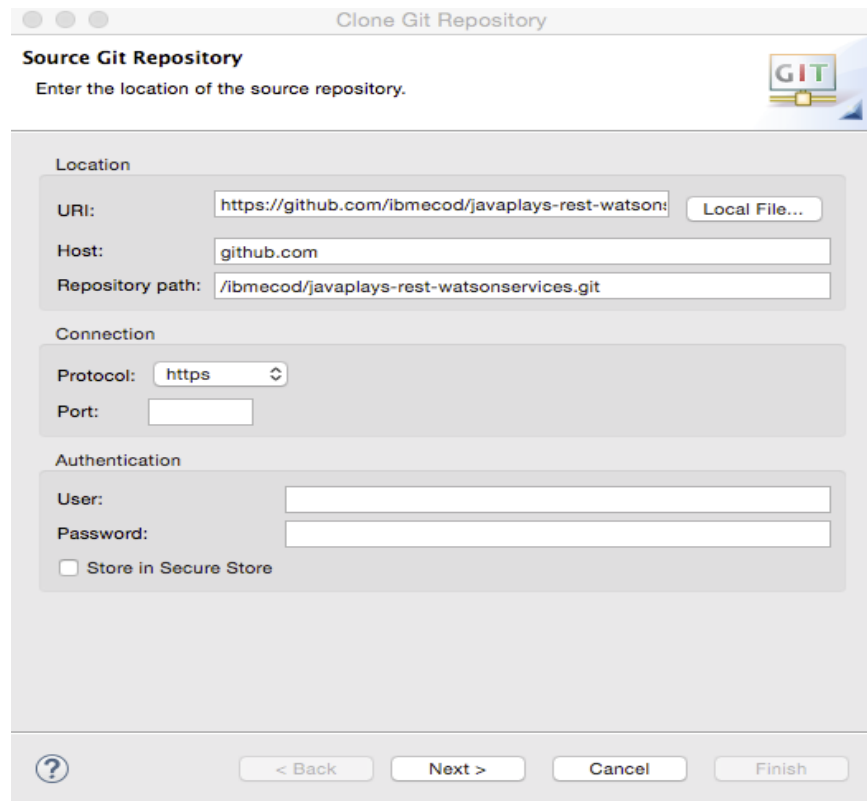
```
public class WatsonService {  
  
    private static final String targetURL = "http://bluemixwatson-backend-restservices.mybluemix.net/api/service/searchtips/";  
    String response;  
  
    public String getResponseFromBluemixWatson(String forminput) {  
        try {
```

- Code Walkthrough → Vaadin UI → Appendix C

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

## 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>



**Clone Git Repository**

Enter the location of the source repository.

**Location**

URI:

Host:

Repository path:

**Connection**

Protocol:

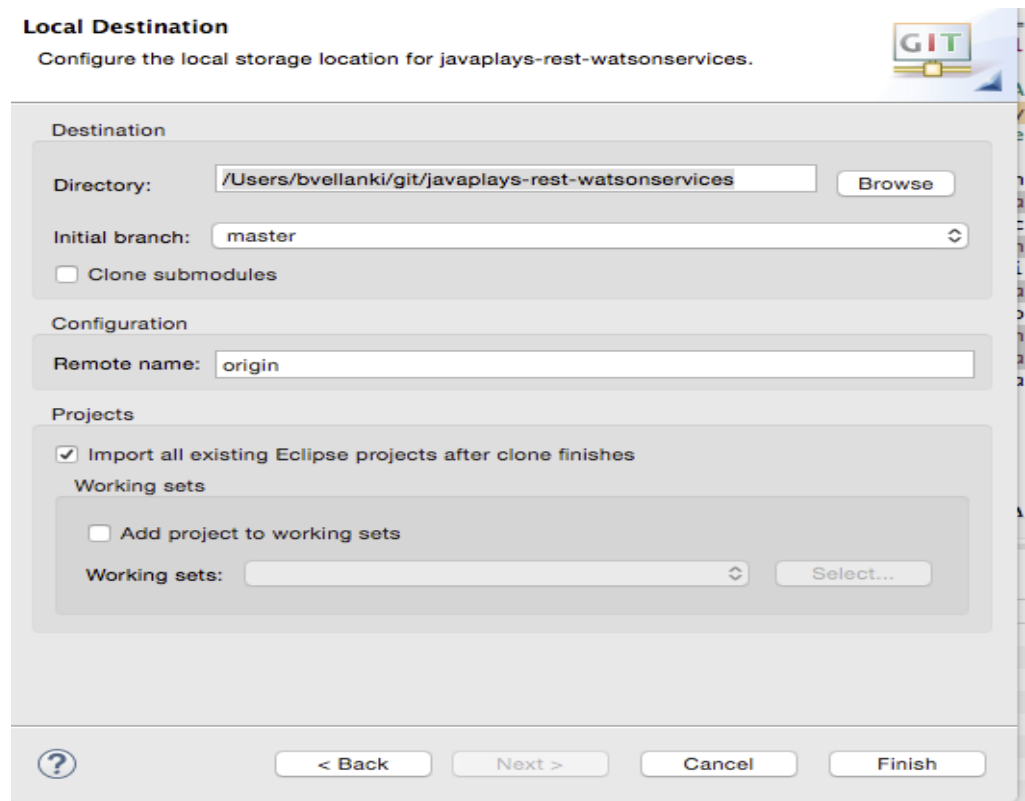
Port:

**Authentication**

User:

Password:

☐ Store in Secure Store



**Local Destination**

Configure the local storage location for javaplays-rest-watsonservices.

**Destination**

Directory:

Initial branch:

☐ Clone submodules

**Configuration**

Remote name:

**Projects**

☒ Import all existing Eclipse projects after clone finishes

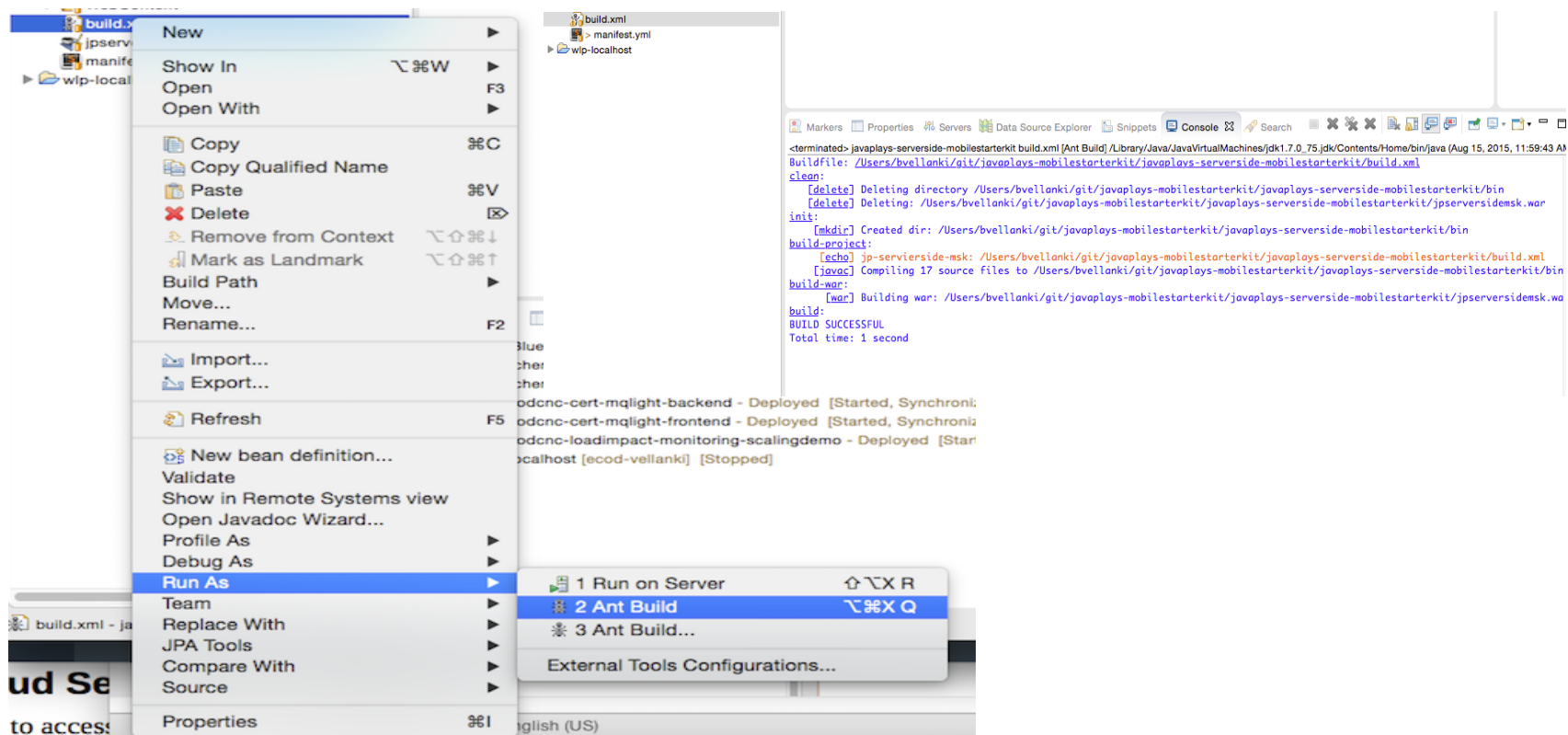
**Working sets**

☐ Add project to working sets

Working sets:

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

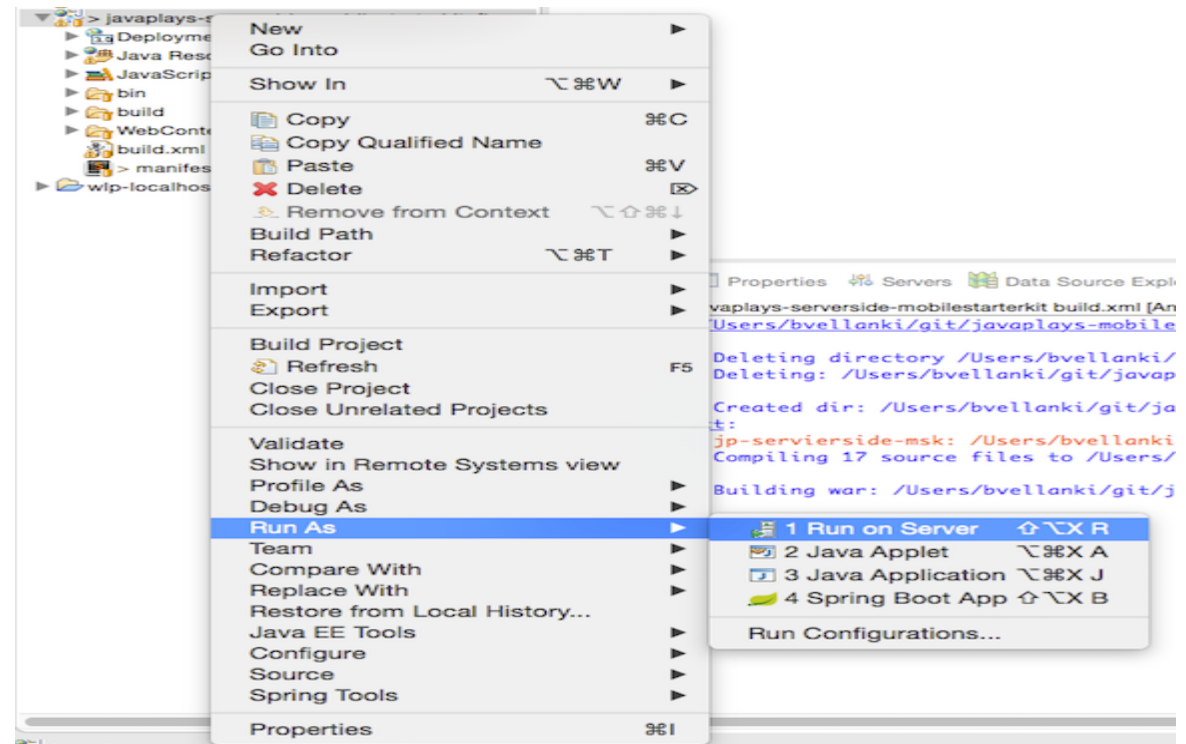
- Build.xml → Run the Ant Build



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

### STEP 1:

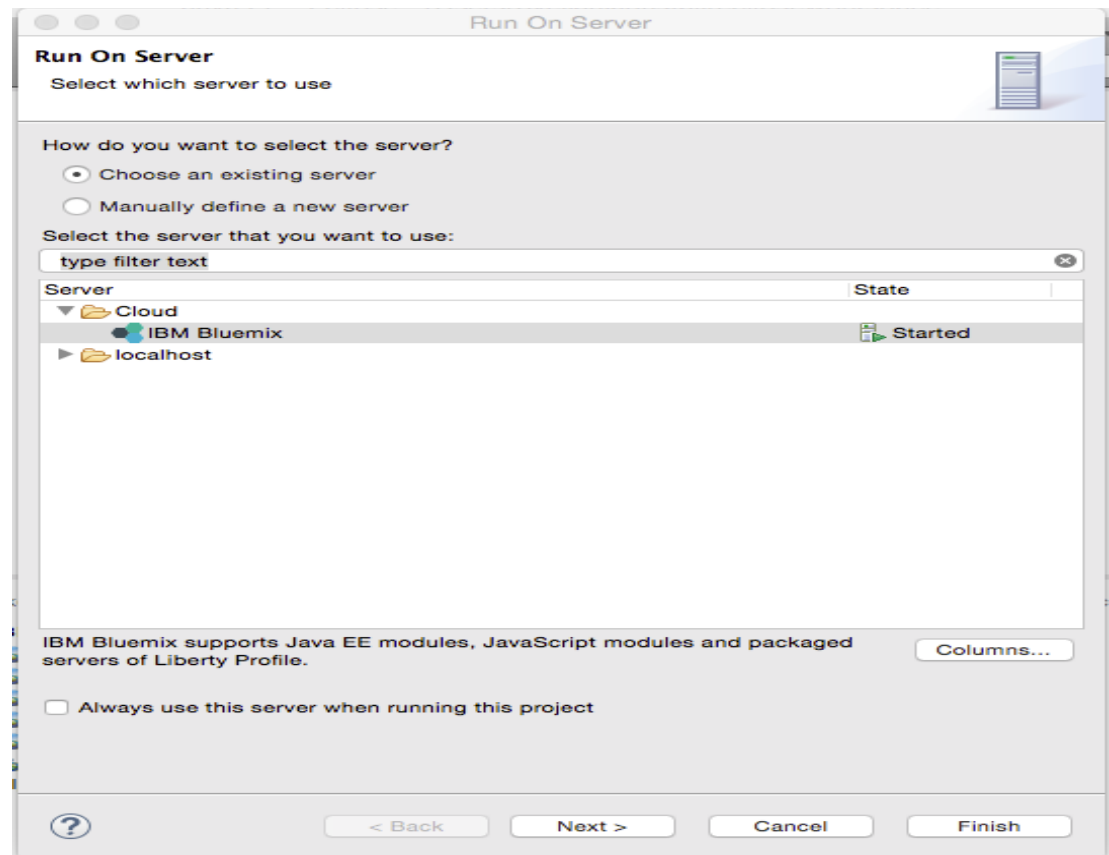
Deploy the application to Bluemix from Eclipse



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

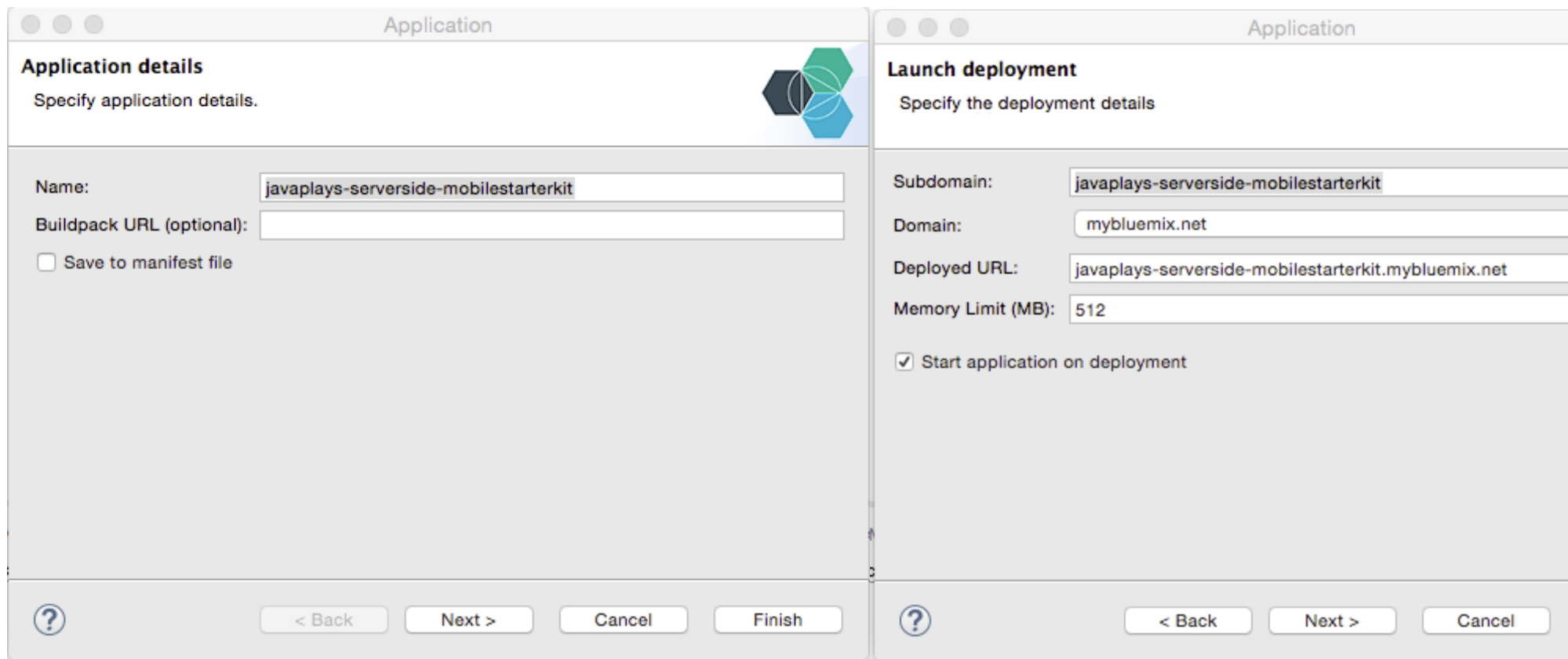
### STEP 2:

Deploy the application to  
Bluemix from Eclipse



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

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



The image shows two side-by-side screenshots of the IBM Cloud Application wizard, specifically the 'Application details' and 'Launch deployment' steps.

**Left Window: Application details**

- Application details**  
Specify application details.
- Name:**
- Buildpack URL (optional):**
- ☐ Save to manifest file

**Right Window: Launch deployment**

- Launch deployment**  
Specify the deployment details
- Subdomain:**
- Domain:**
- Deployed URL:**
- Memory Limit (MB):**
- ☒ Start application on deployment

Both windows have a bottom bar with a help icon, '< Back', 'Next >', 'Cancel', and 'Finish' buttons.



## 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

#### Services selection

Bind or add new services



Select services to bind to the application:

Name	Vendor	Provider	Version
<input type="checkbox"/> Auto-Scaling-74	Auto-Scaling		
<input checked="" type="checkbox"/> Concept Expansion-nx	concept_expan...		
<input checked="" type="checkbox"/> Question and Answer-bz	question_and_a...		
<input type="checkbox"/> ecodcnc-cert-mqlightservice	mqlight		
<input type="checkbox"/> ecodcnc-cloudant-cloudantNoSQLDB	cloudantNoSQ...		
<input type="checkbox"/> ecodcnc-loadimpact	loadimpact		
<input type="checkbox"/> ecodcnc-mqlight-alchemy	mqlight		
<input checked="" type="checkbox"/> ecodcnc-mysql-mobilestarter	cleardb		
<input type="checkbox"/> ecodmonitoringdemo-DataCache	DataCache	IBM	1.0



< Back

Next >

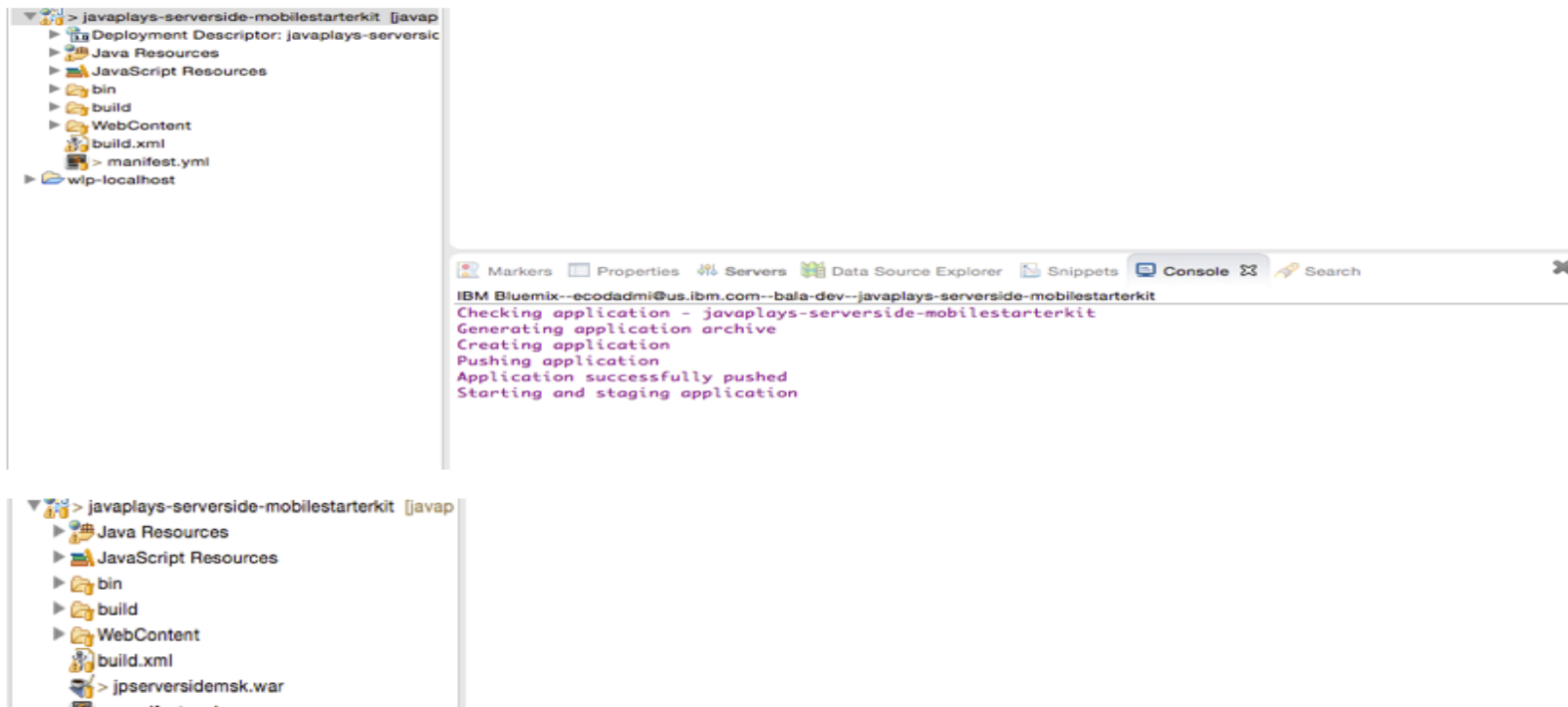
Cancel

Finish

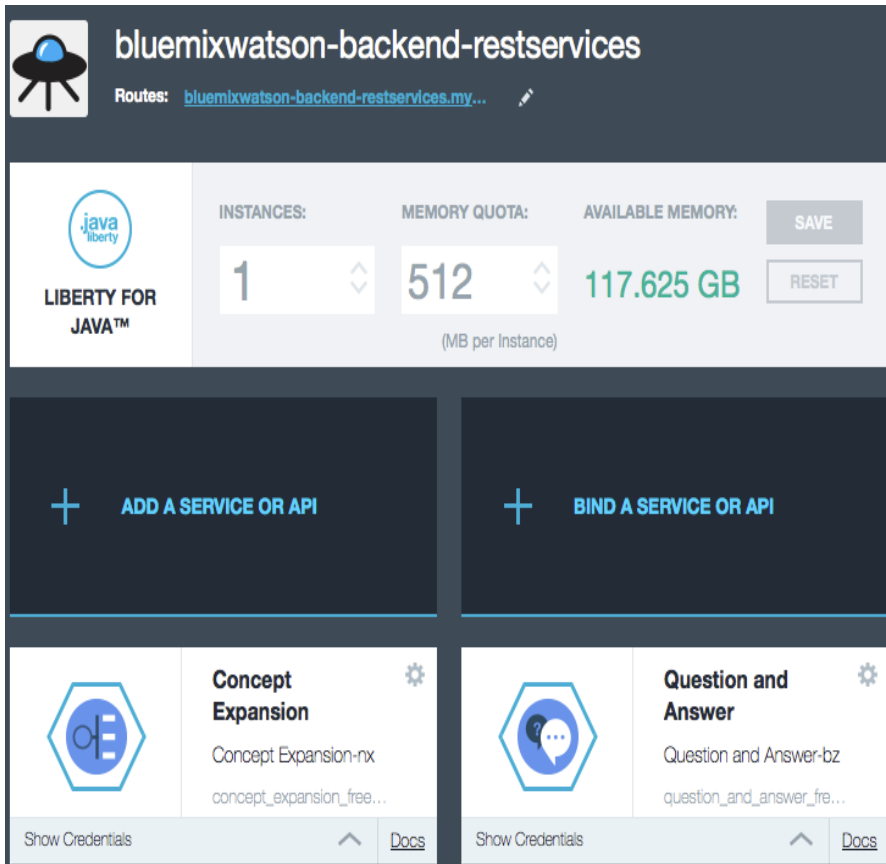
## STEP 4 – APPENDIX A - BLUEMIX BACKEND APP TO PUBLISH RESTFUL API FOR WATSON



STEP 4:

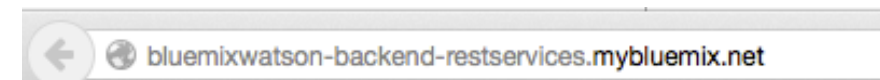
Deploy the application to



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



The screenshot shows the IBM Bluemix console interface for the application **bluemixwatson-backend-restservices**. The top bar displays the application name and its routes: `bluemixwatson-backend-restservices.my...`. Below this, the configuration section shows the application is using **LIBERTY FOR JAVA™** with **1** instance, a **512** MB memory quota, and **117.625 GB** of available memory. There are **SAVE** and **RESET** buttons for these settings. The main area contains two large buttons: **+ ADD A SERVICE OR API** and **+ BIND A SERVICE OR API**. At the bottom, there are two service cards: **Concept Expansion** (with icon ) and **Question and Answer** (with icon ). Each card shows the service name and a truncated instance ID, along with **Show Credentials** and **Docs** links.



Hello!!! Welcome IBM Bluemix Watson REST Services Sample Application

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

## 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

## 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 mysqlbkey, BasicDBObject vcapobj) {  
    BasicDBList mysqlblist = (BasicDBList) vcapobj.get(mysqlbkey);  
    vcapobj = (BasicDBObject) mysqlblist.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

## 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 be passed as an output to the /searchtips rest call.
- The results are displayed on the Vaadin UI Screen

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



## 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 PPLICATION"));
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 using different  
layouts

## 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

# VAADIN – BLUEMIX – WATSON HEALTHCARE SAMPLE APP

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



WELCOME TO IBM VAADIN CHALLENGE

VAADIN BLUEMIX WATSON HEALTHCARE SERVICES SAMPLE PPLICATION

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.

# Questions?