Application Update

NOTE: Education materials and other documentation as applicable including programming manuals, operating guides, physical planning manuals and installation manuals related to the IBM Products may be early versions subject to change.

What this exercise is about

WebSphere Application Server v6.0.1 provides various features which can be used to manage your J2EE 1.4 applications. This exercise will have you update a J2EE 1.4 application using various methods.

Lab Requirements

List of system and software required for the student to complete the lab.

- WebSphere Application Server v6.0.1 should be installed. Read the SystemSetup_ReadMe file included with the lab sample code for system setup information.
- Installation of lab sample code into directories
    - Windows workstation: **C:\Labfiles60**

- z/OS server system: **/etc/Labfiles60**

- Experience with previous versions of WebSphere Application Server and the J2EE programming model is also helpful.

What you should be able to do

At the end of this lab you should be able to:

- Update your application in WebSphere Application Server v6.0.1.
- Initiate a partial application update within WebSphere Application Server v6.0.1.

Introduction

The J2EE 1.4 application which you will be updating is a simple banking application named WebSphereBank. It is composed of EJB, Web, and Application Client modules. In the EJB module there is a session bean and an entity bean.

In this lab, you will be updating the WebSphereBank application running on the WebSphere Application Server v6.0.1. The process you will use to update the application will depend on whether you are performing a full application update, or a partial application update.

Exercise Instructions

Some instructions in this lab may be Windows operating-system specific. If you plan on running the lab on an operating-system other than Windows, you will need to execute the appropriate commands, and use appropriate files(.sh vs. .bat) for your operating system. The directory locations are specified in the lab instructions using symbolic references, as follows:

Location Reference	Windows example	z/OS example
<WAS_HOME>	C:\WebSphere\AppServer\	/etc/c6cellB/AppServer
<HOST_NAME>	localhost	mvs22x.rtp.raleigh.ibm.com
<SERVER_NAME>	Server1	C6Server01
<HOST_LAB_FILES>		/etc/LabFiles60
<LOCAL_LAB_FILES>	C:\LabFiles60	

**** NOTE ** Solution instructions are normally provided at the end. The solution is not provided in this case because you need to do the exercises in order to understand Java tools and there is no final solution to import. To go through the lab, start at Part One assuming you have met the requirements in the section "User Requirements" stated above.**

Part 1: Preparing the Environment on Host System

____ 1. You will prepare the lab setup script.

__ a. Telnet to your host system:

```
telnet MVS22x.RTP.RALEIGH.IBM.COM 1023
```

cd /etc/LabFiles60/common

__ b. Within **<HOST_LAB_FILES>/common** directory, edit **labSetup.sh** file to ensure that the variables are correct for WAS_HOME, WAS_USER_SCRIPT, and LAB_FILES. Save the above changes and close the file. If you are running this lab on the class systems, all the information should be correct. So if you don't feel comfortable using vi editor, you can skip this step.

vi labSetup.sh

"j" scrolls down.

":q" quits and ":wq" writes and quits

____ 2. Issue the following commands to ensure the scripts have "execute" rights:

chmod +x labSetup.sh

____ 3. Ensure the server is started

__ a. At the command prompt, navigate to **<WAS_HOME>/profiles/default/bin**

cd /etc/c6cellB/AppServer/profiles/default/bin

__ b. Check to see if the server is running

```
./serverStatus.sh <SERVER_NAME>
```

__ c. If the server status does not indicate STARTED, then start the server:

```
./startServer.sh <SERVER_NAME>
```

Part 2: Creating the BANKDB Cloudscape database

This step demonstrates the creation of the Cloudscape BANKDB database, which you will need for the WebSphereBank application. You will use commands to create the database and tables. The database will be created in the <LAB_FILES>/CloudscapeDB directory.

____ 1. Generate the Cloudscape BANKDB database and tables.

__ a. In a command window, navigate to

/etc/c6cellB/AppServer/cloudscape/bin/embedded

__ b. Issue the Cloudscape **ij** command to start the Cloudscape utility

./ij.sh

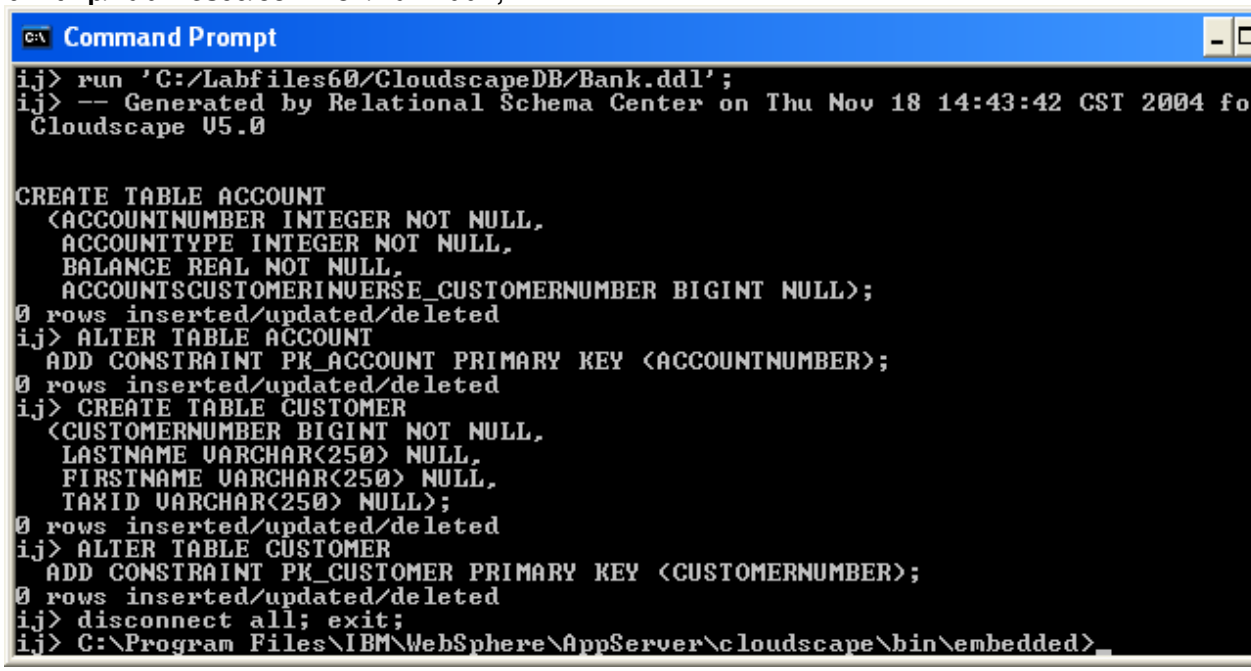
__ c. Issue the following commands, replacing <LAB_FILES> with your lab file path:

mkdir /tmp/LabFiles60/CloudscapeDB

connect 'jdbc:db2j:/tmp/LabFiles60/CloudscapeDB/BANKDB;create=true';

Note: this command may run for 10 to 30 seconds; when the command completes, you will see the "ij>" prompt with no messages

1) **run 'tmp/LabFiles60/common/Bank.ddl';**



2) disconnect all; exit;

3) Go to the <LAB_FILES> directory and issue 'chmod -R 777 CloudscapeDB'

The BANKDB database and tables have been created.

Part 3: Installing the WebSphereBank Application

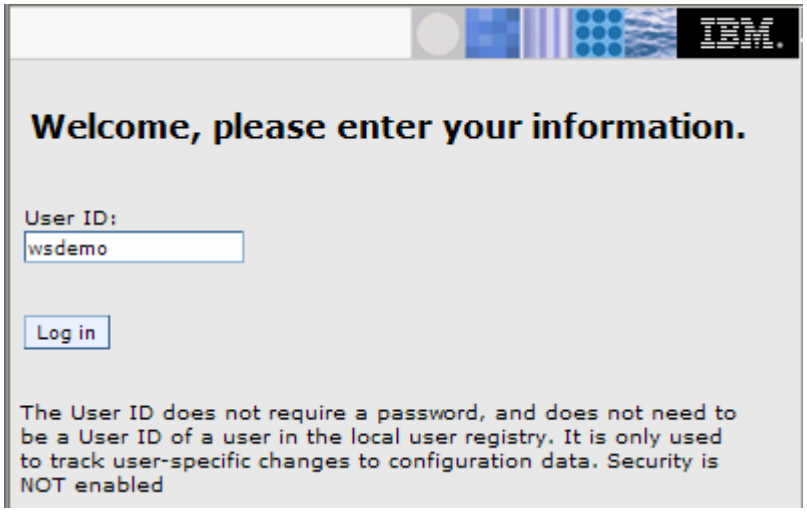
You will install the WebSphereBank ear file that is provided in the WebSphereBank lab file using the WebSphere Application Server Admin Console.

____ 1. Start the Administrative Console.

__ a. Open a Web Browser and navigate to the following URL:

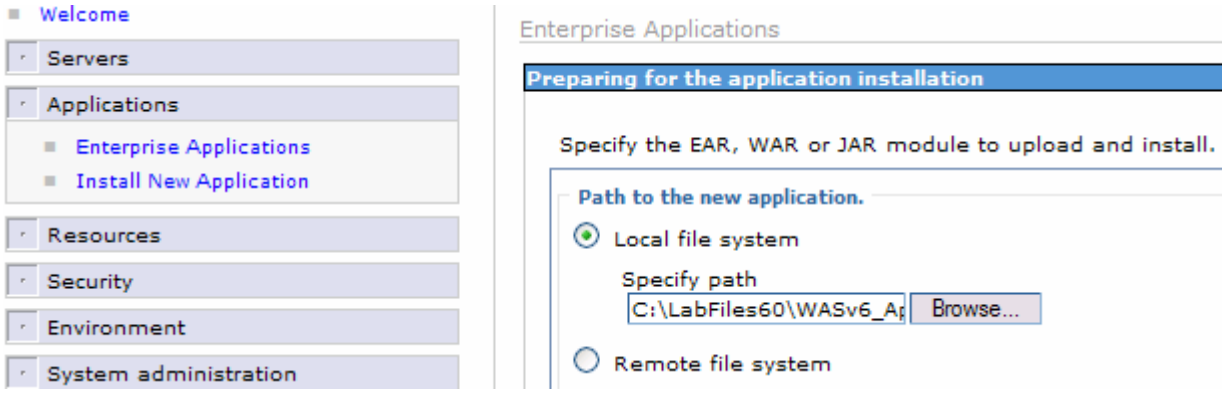
http://<HOST_NAME>:9080/ibm/console

__ b. When prompted for a User ID, enter **wsdemo** to log in.



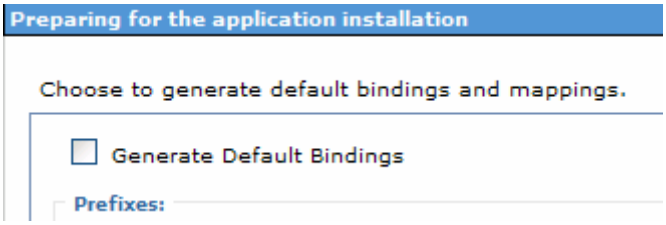
____ 2. Expand **Applications** and click **Install New Application** under Applications on the navigation panel.

____ 3. For path specify **<LOCAL_LAB_FILES>\ApplUpdate\WebSphereBank.ear**.



____ 4. Click **Next**.

____ 5. On the next screen, ensure that “Generate Default Bindings” is unchecked, since all the bindings are configured in the deployment descriptors.



____ 6. Click **Next.**

____ 7. If you see an Application Security Warnings screen, click **Continue**.

____ 8. In **"Step 1: Select installation options"** :

__ a. Ensure that **Deploy Enterprise Beans** is unchecked (we deployed the Enterprise Beans in IRAD)

__ b. Ensure the application name is **WebSphereBank.**

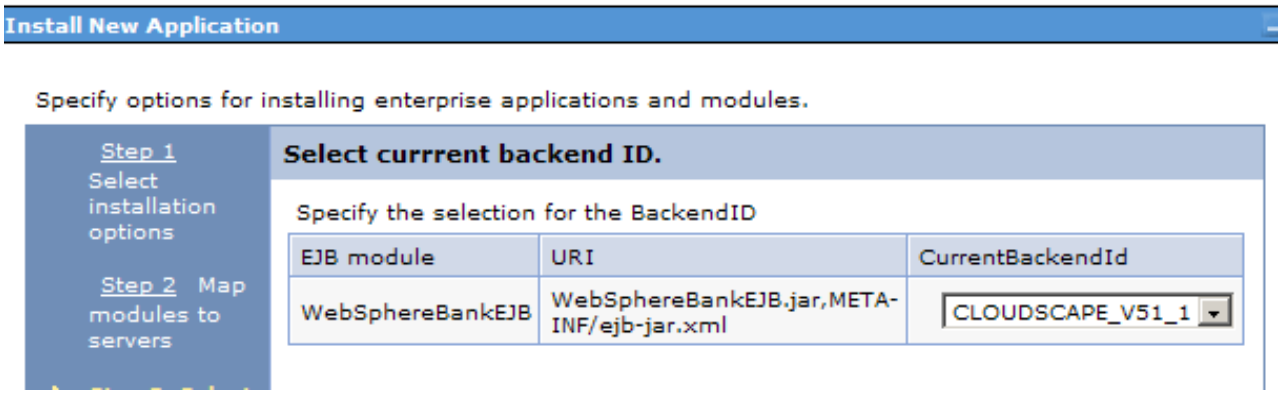
Error! Objects cannot be created from editing field codes.

__ c. Click **Next.**

____ 9. In "**Step 2: Map modules to servers",** accept the default mapping by clicking **Next.**

____ 10. In "**Step 3: Select currrent backend ID.**":

__ a. Verify that **Cloudscape_V51_1** is selected.



This was done in IRAD when we ran the EJBDeploy on the beans. We only have one choice here because we only deployed the beans to the Cloudscape backend. If we had deployed to a variety of backends, there would be more choices here. The Deploy process is specific to a container, and if Container Managed Persistence is used, it is necessary to specify the database as well.

__ b. Click **Next**

____ 11. In **"Step 4: Provide JNDI Names for Beans"** click **Next** to accept the default values for JNDI Names

____ 12. In **"Step 5: Provide default data source mapping for modules containing 2.x entity Beans"**:

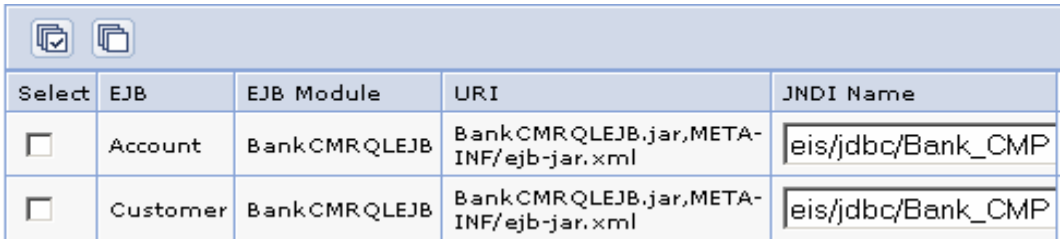
__ a. Note that JNDI name **jdbc/Bank** is the one used while configuring your Data Source.

__ b. Click **Next**

____ 13. If you see any Warnings, click **Continue**.

____ 14. In **"Step6: Map datasources for all 2.0 CMP beans"**:

__ a. Enter **eis/jdbc/Bank_CMP** in the **JNDI Name** field for both EJBs, as follows:



Select	EJB	EJB Module	URI	JNDI Name
☐	Account	BankCMRQLEJB	BankCMRQLEJB.jar,META-INF/ejb-jar.xml	eis/jdbc/Bank_CMP
☐	Customer	BankCMRQLEJB	BankCMRQLEJB.jar,META-INF/ejb-jar.xml	eis/jdbc/Bank_CMP

This JNDI name can be just selected rather than typing as above if you had created a datasource before the installation of the application, and if you click the checkbox *Use this data source for container managed persistence (CMP)* when you create the data source, another reference is created with the name of *eis/jndi_name_of_datasource_CMP*. For example, if a data source has a JNDI name of *jdbc/myDatasource*, the CMP JNDI name is *eis/jdbc/myDatasource_CMP*. This name is used internally by CMP and is provided simply for informational purposes.

__ b. Click **Next** to proceed.

____ 15. If you see any Warnings, click **Continue**.

____ 16. Click on **Step 10** to skip over the remaining steps.

____ 17. In **"Step 10: Summary":**

__ a. Review the values in the screen capture

Summary

Summary of installation options

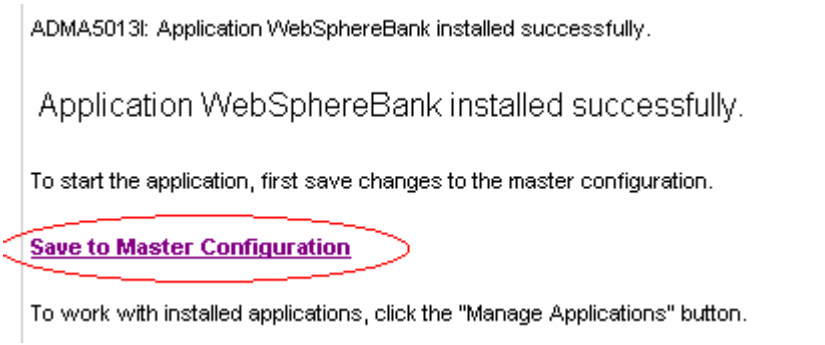
Options	Values
Use Binary Configuration	No
Create MBeans for resources	Yes
Cell/Node/Server	Click here
Reload interval in seconds	
Enable class reloading	No
Process embedded configuration	Yes
Application name	WebSphereBank
Validate Input off/warn/fail	warn
Directory to install application	Yes
Distribute application	Yes
Deploy Web services	No
Pre-compile JSP	No
Deploy enterprise beans	No

__ b. Click **Finish**

Note: the step numbers are context sensitive. Which panels are displayed depends on the contents of the EAR file. Other applications may have different step numbers. The steps that were skipped over here were panels where the defaults are taken.

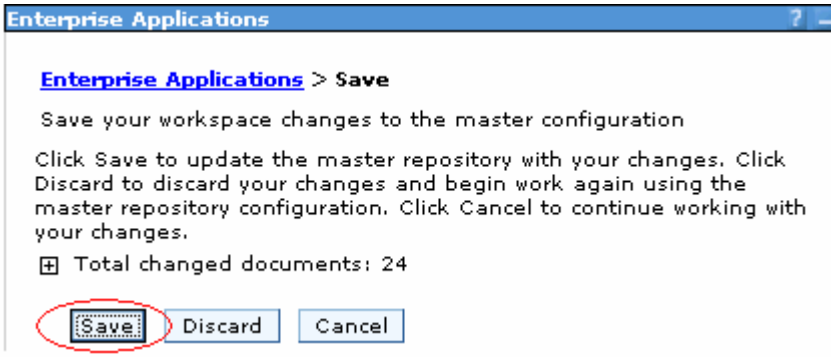
The installation process will take a minute or two. An instance of the workbench is started and the Ejbdeploy process runs, preparing a copy of the EAR file to be installed. Wait for the message that says the application installed successfully

____ 18. After messages indicate installation was successful, you need to **Save to Master Configuration**.



__ a. Click **Save to Master Configuration.**

__ b. Click **Save**.

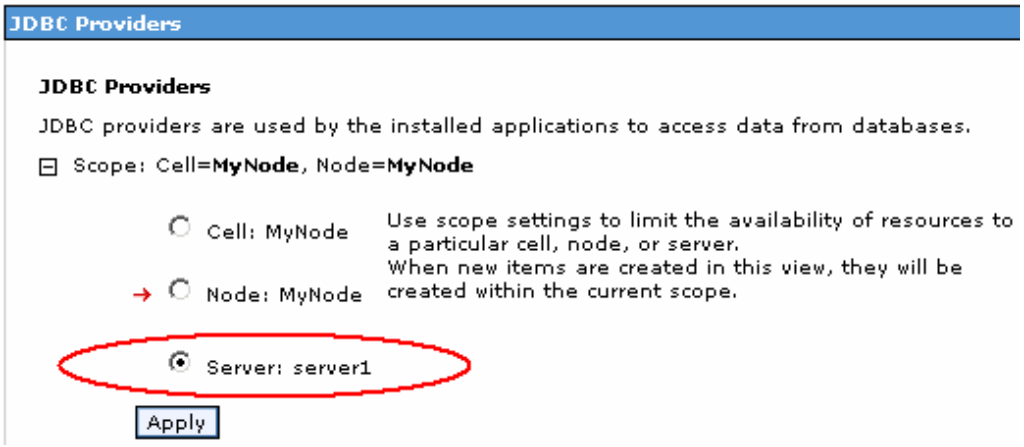


Part 4: Configure a JDBC Driver and a Data Source

You will define and configure the JDBC Driver and Data Source so the WebSphereBank application can access the Cloudscape BANKDB database.

____ 1. Data sources and other resources are organized under the Resources heading. Expand **Resources** and click **JDBC Providers** to configure the data source which the WebSphereBank application will use to store data.

____ 2. The existing JDBC Providers that are configured at the Node level will be displayed. In order to configure a new provider scoped to the Application Server, select **Server: <SERVER_NAME>**.



____ 3. Click **Apply**

Note: the JDBC Providers that are configured at the Server level were not displayed immediately when you clicked <SERVER_NAME>; they were only displayed when you clicked Apply.

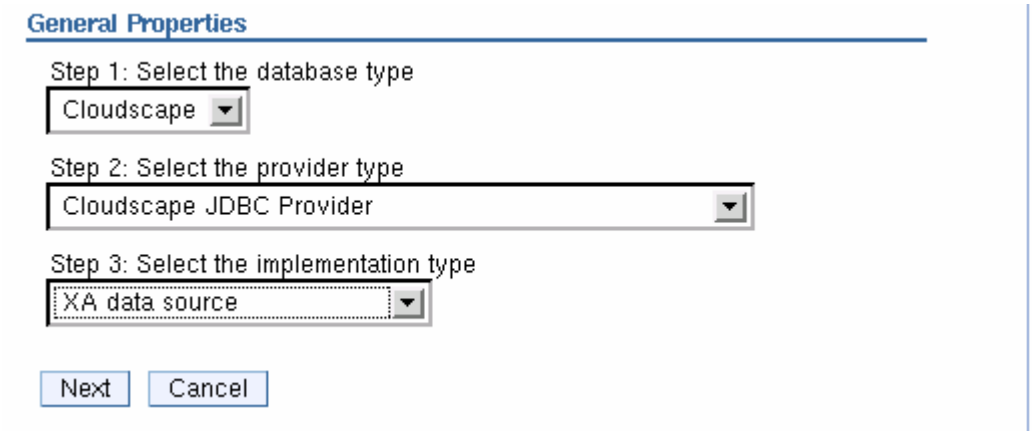
Note: if the node is federated with a Deployment Manager, you will see a browse button and will need to browse to the node before selecting a server.

____ 4. Click **New**. In the **General properties** screen, select:

__ a. Step1: Select the database type as **Cloudscape.**

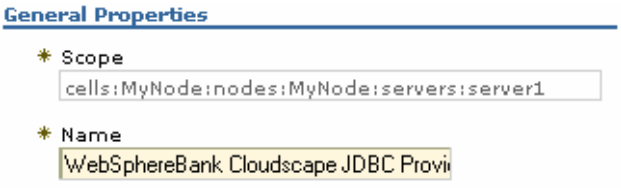
__ b. Step 2: Select the provider type as **Cloudscape JDBC Provider.**

__ c. Step 3: Select the implementation type as **XA data source**.

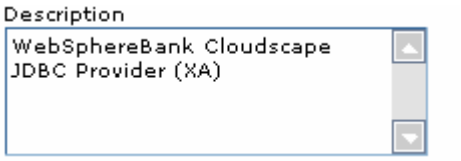


____ 5. Click **Next**.

____ 6. In this screen change the provider name to **WebSphereBank Cloudscape JDBC Provider (XA)**



____ 7. Change the description to WebSphereBank Cloudscape JDBC Provider (XA)



____ 8. Click **OK**. The list of JDBC Providers configured at the server scope will be displayed.

____ 9. Click **Save** in the banner at the top of the page.

____ 10. Click the **Save** button.

____ 11. Click **WebSphereBank Cloudscape JDBC Provider (XA)**

____ 12. Click **Data Sources** under Additional Properties on the right side of the window.

____ 13. Click **New** to create a Data Source.

____ **14.** The empty configuration properties for the data source will be displayed. Enter the following:

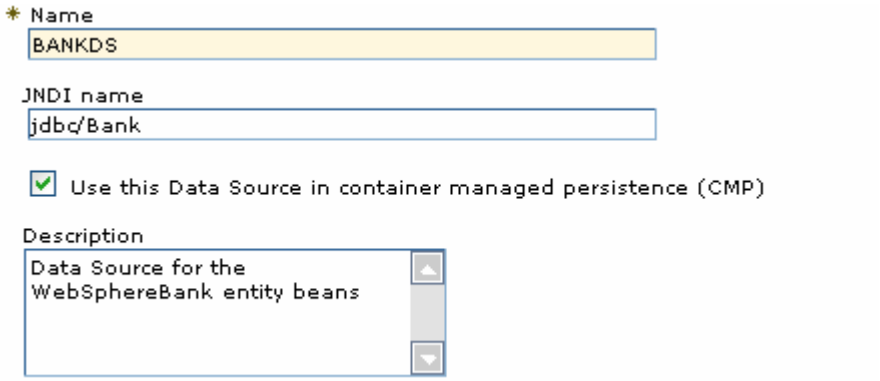
__ a. Name: **BANKDS**

__ b. JNDI name**:** **jdbc/Bank**

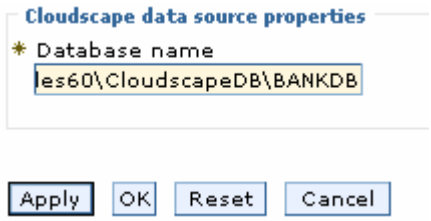
__ c. Make sure there is check next **to "Use this Data Source in container managed persistence (CMP)"**

Note: If this box is not checked, you will have problems at runtime because the corresponding connection factory will not be created.

__ d. Description: Data Source for the WebSphereBank entity beans



__ e. Near the bottom of the same screen under Cloudscape data source properties type the **Database name** as **<HOST_LAB_FILES>/CloudscapeDB/BANKDB** (Ex. /etc/LabFiles60/CloudscapeDB/BANKDB):



____ 15. Click **OK**; the data source BANKDS will appear within the list of data sources.

____ 16. Click **Save** in the banner at the top of the page.

____ 17. Click the **Save** button.

____ 18. Click **BANKDS.**

____ 19. On the right hand side click on **Custom properties.**

__ a. Click **connectionAttributes.**

__ b. Enter the value **upgrade=true.**

Note: The value “upgrade=true” will cause Cloudscape database version to be checked. If it is at an earlier version level, the database will be converted to the current level.

__ c. Click **OK.**

____ 20. Your Data Source is completely defined. With WebSphere Application Server v6.0, configuration changes to your server, such as defining a JDBC Provider and Data Source, must be saved with a explicit call to the Save operation in the Administrative console.

____ 21. Click **Save** in the banner at the top of the page.

____ 22. Click the **Save** button.

____ 23. Log out of the Admin Console.

__ a. Click the **Logout** link in the header.

____ 24. Stop and restart the server from you telnet session.

__ a. Stop the server

```
./stopServer.sh <SERVER_NAME>
```

__ b. Start the server

```
./startServer.sh <SERVER_NAME>
```

Note: There are two reasons for stopping and restarting the application server at this point. The first is that changes to Data Sources are picked up at startup. The second is that there is a naming issue in the Beta with EJBs not being removed from the namespace when the application stops. If the Samples had been installed, installing and starting WebSphereBank at this point would result

____ 25. Test the application.

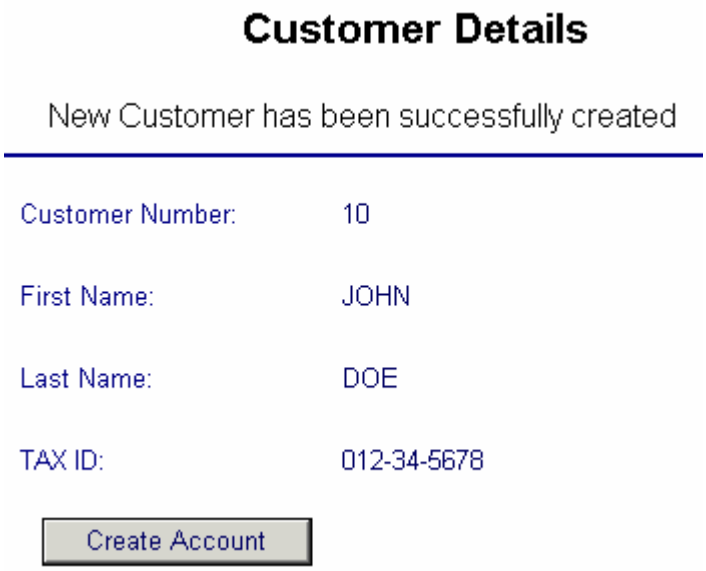
__ a. Open a browser.

__ b. Enter the URL **http://<hostname>:9080/WebSphereBankWeb/.**

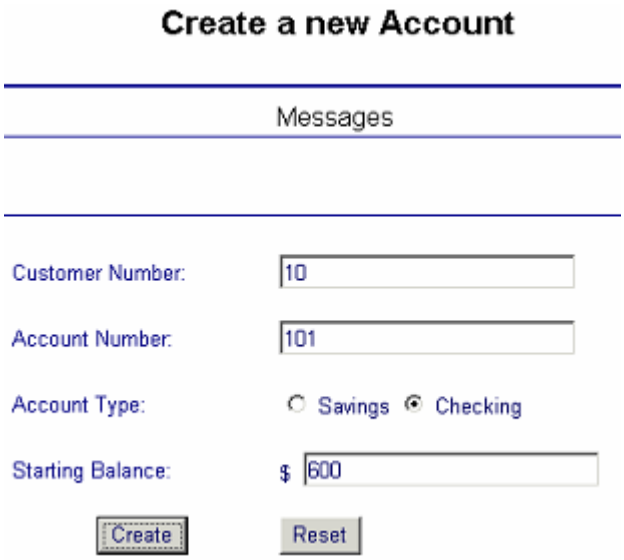
__ c. Click on Create Customer.

__ d. Enter Customer Number, Name and Tax ID. Click **Create**.

____ 26. You will see details for customer created. Click **Create Account**.



____ 27. Enter **101** for the Account Number, **Checking** for account type and **600** for the starting balance. Click **Create**.



____ 28. Create a second account.

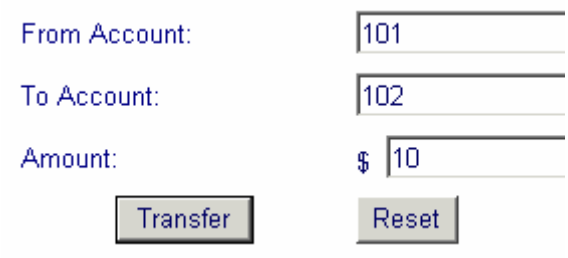
__ a. Enter **102** for the Account Number, **Savings** for account type and **400** for the starting balance. Click **Create**.

If the accounts are created without generating errors, then the Data Source is working otherwise make sure the **databasename** is correct in datasource properties and make sure to test the datasource.

____ 29. Test transferring funds.

__ a. Click **Transfer Funds**.

__ b. For the From Account enter **101,** for the To Account enter **102**, and for the amount enter **10**.

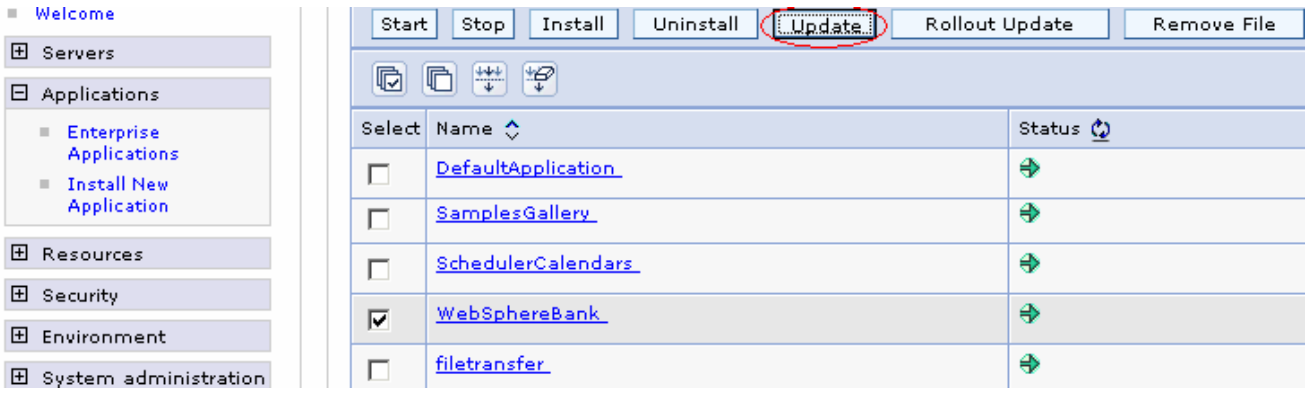


__ c. Click **Transfer**.

__ d. You will notice that the messages reflect the transfer amount.

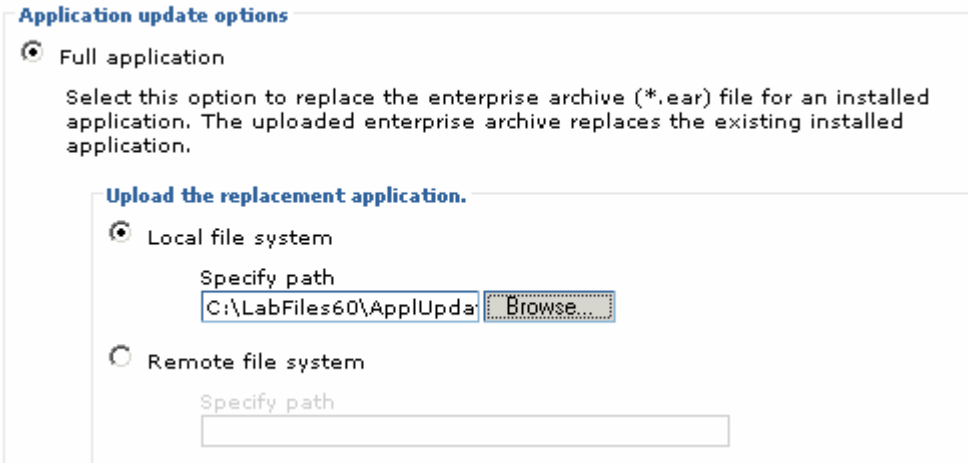
Part 5: Full Application Update

____ 1. In the Admininstrative console, under **Applications > Enterprise Applications**, select the **WebSphereBank** application and click on **Update**.



____ 2. In update window, select **Full application**.

____ 3. For path specify **<LOCAL_LAB_FILES>\ApplUpdate\WebSphereBank2.ear**.

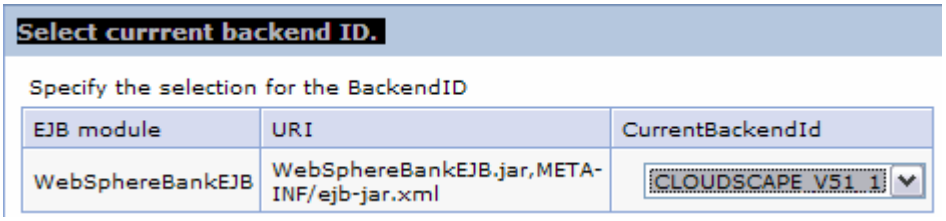


____ 4. Click **Next**.

____ 5. On the next panel, click **Next**.

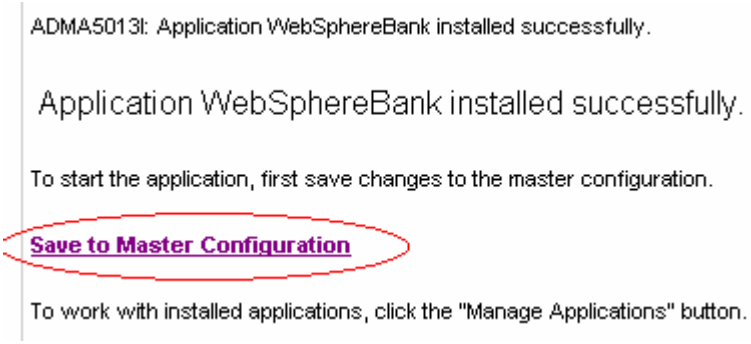
____ 6. Click **Step 3 Select current backend ID**.

____ 7. Verify **CLOUDSCAPE_V51_1** is selected for **Database type** and click **Next**.



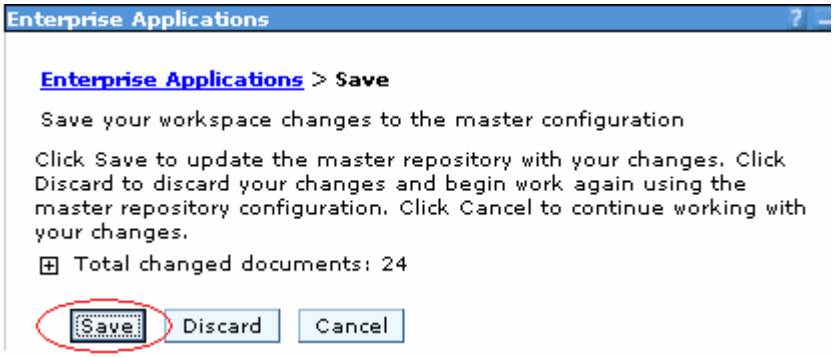
____ 8. Click **Step 10 Summary**, then click **Finish**.

____ 9. After messages indicate installation was successful, you need to **Save to Master Configuration**.



__ a. Click **Save to Master Configuration.**

__ b. Click **Save**.



____ 10. Test the updated application.

__ a. Open a Web Browser and navigate to the following URL:

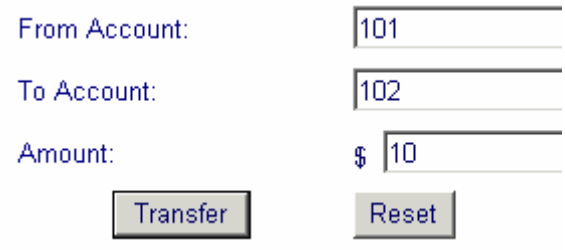
`http://<hostname>:9080/WebSphereBankWeb`

__ b. Click **Get Balance**.

__ c. For the Account Number enter **101,** note account balance _____.

__ d. Click **Transfer Funds**.

__ e. For the From Account enter **101,** for the To Account enter **102**, and for the amount enter **10**.

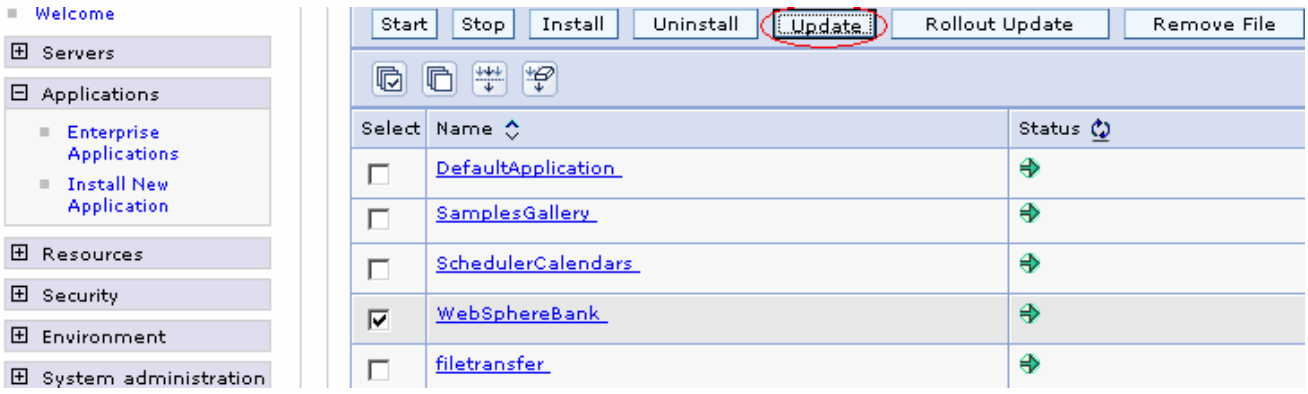


__ f. Click **Transfer**.

__ g. You will notice that the messages indicate an incorrect transfer amount. An extra $10 was transferred. Also, “Massages” is spelled incorrectly. Let’s fix the spelling.

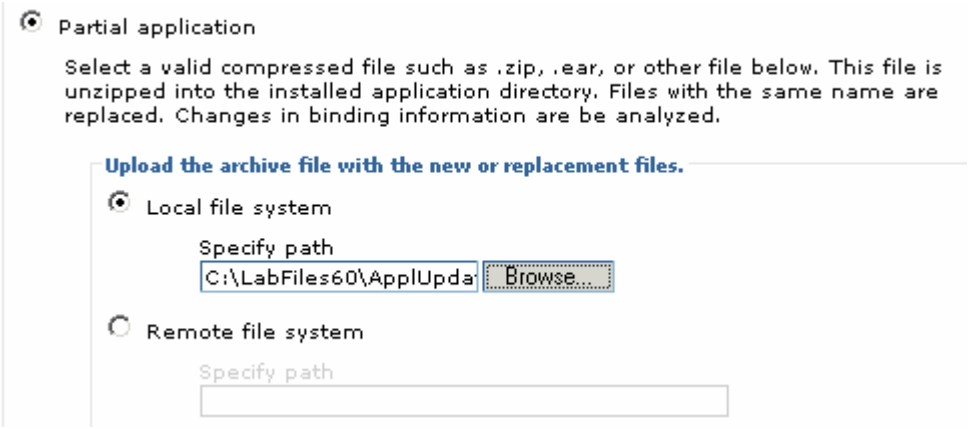
Part 6: Partial Application Update Using ZIP File

____ 1. In the Admin console, under **Applications > Enterprise Applications**, select the **WebSphereBank** application and click on **Update**.



____ 2. In update window, select **Partial application**.

____ 3. For path specify **<LOCAL_LAB_FILES>\ApplUpdate\WebSphereBank3.zip**.

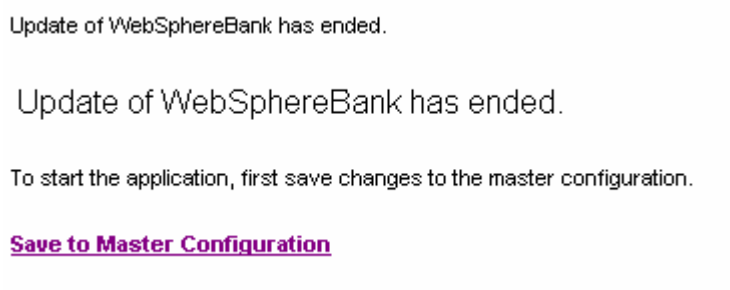


____ 4. Click **Next**.

____ 5. On the next panel click **OK**.

Notice how much faster this update is versus the full application update you did earlier.

____ 6. After messages indicate update has ended, you need to **Save to Master Configuration**.



__ a. Click **Save to Master Configuration.**

__ b. Click **Save**.

____ 7. Test the updated application.

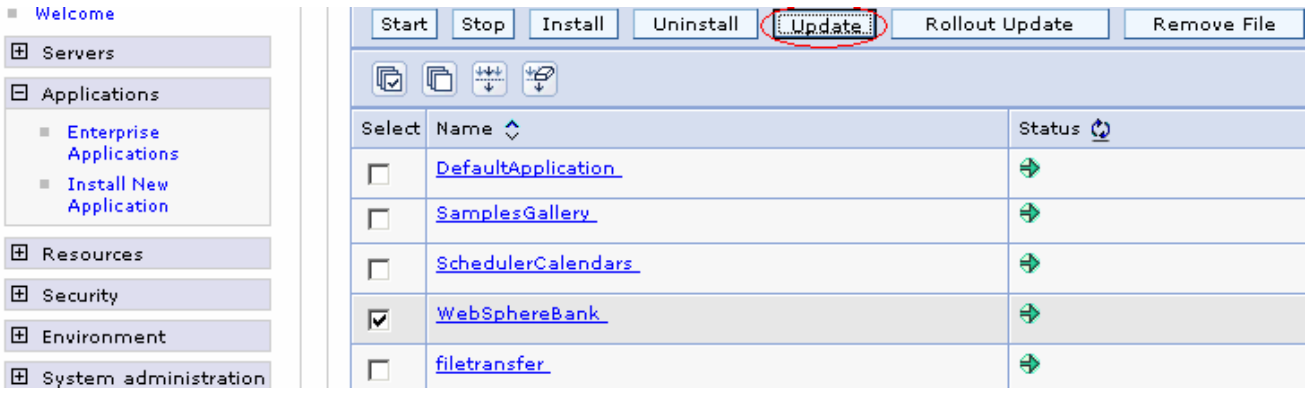
__ a. Back in the WebSphereBank window, refresh your screen.

__ b. You will notice that “Masseges” is now “Transaction Messages”, and the WebSphere Bank gif has been changed to include shadows.

__ c. Let’s change “Transaction Messages” back to “Messages”.

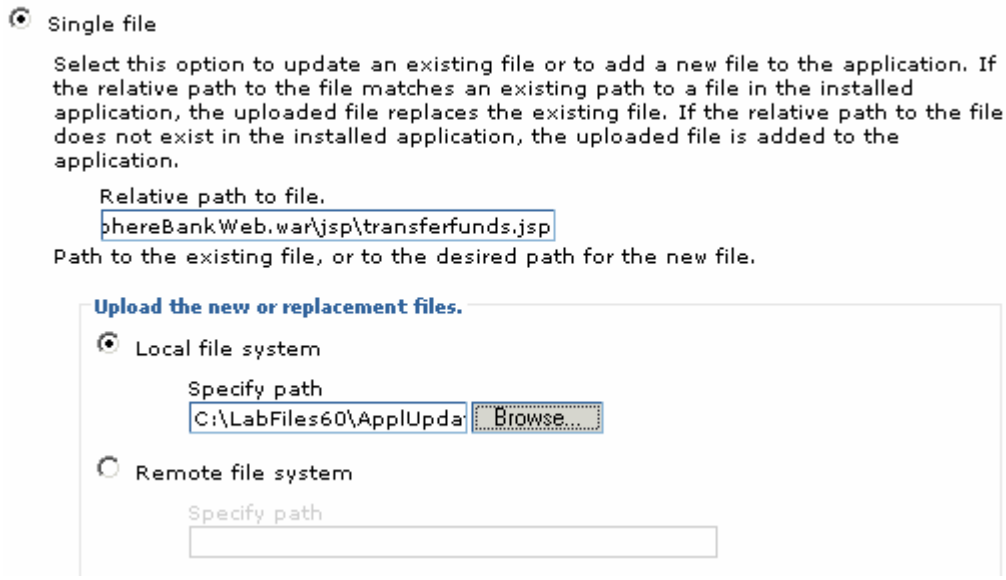
Part 7: Single File Application Update

____ 1. In the Admin console, under **Applications > Enterprise Applications**, select the **WebSphereBank** application and click on **Update**.



____ 2. In update window, select **Single file**. For **Relative path to file,** specify **WebSphereBankWeb.war/jsp/transferfunds.jsp.**

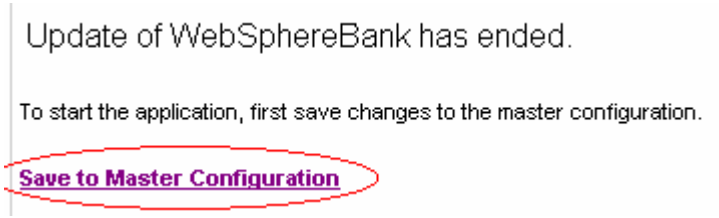
____ 3. For path specify **<LOCAL_LAB_FILES>\ApplUpdate\transferfunds4.jsp**.



____ 4. Click **Next**.

____ 5. On the next panel, click **OK**.

____ 6. After messages indicate update has ended, you need to **Save to Master Configuration**.



__ a. Click **Save to Master Configuration.**

__ b. Click **Save**.

____ 7. Test the updated application.

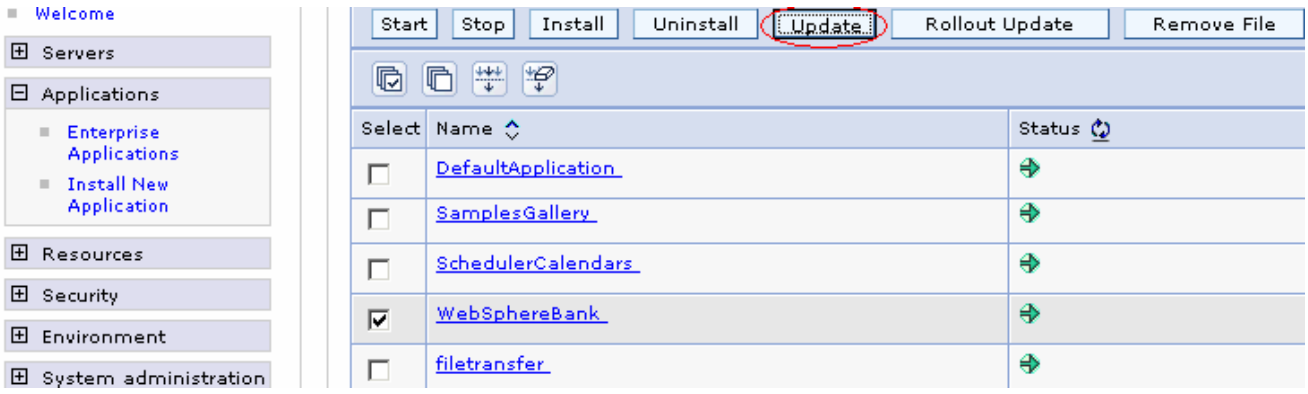
__ a. Back in the WebSphereBank window, refresh your screen or click **Transfer Funds** again.

__ b. Notice that “Transaction Messages” is back to “Messages”.

____ 8. We still need to fix the transfer problem. Let’s do that next.

Part 8: Single Module Application Update

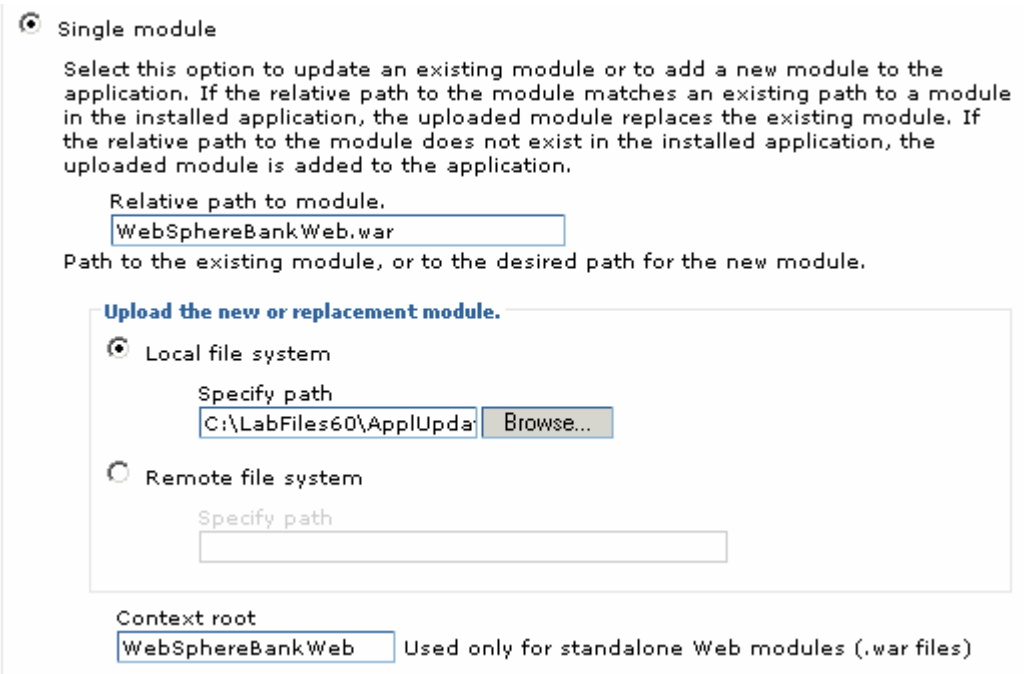
____ 9. In the Admin console, under **Applications > Enterprise Applications**, select the **WebSphereBank** application and click on **Update**.



____ 10. In update window, Select **Single module**. For **Relative path to file,** specify **WebSphereBankWeb.war**.

____ 11. For path specify **<LOCAL_LAB_FILES>\ApplUpdate\WebSphereBankWeb5.war**.

____ 12. For Context root specify **WebSphereBankWeb.**



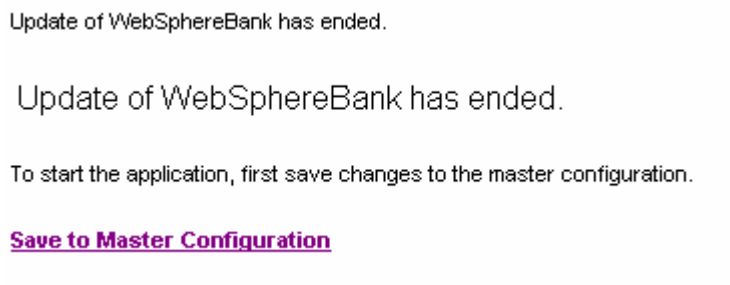
____ 13. Click **Next**.

____ 14. On the next panel, click **Next**.

____ 15. On the next panel, click **Continue**.

____ 16. On the next panel, click **Step 5 Summary**, then click **Finish**.

____ 17. After messages indicate update has ended, you need to **Save to Master Configuration**.



__ a. Click **Save to Master Configuration.**

__ b. Click **Save**.

____ 18. Test the updated application.

__ a. Return to the WebSphereBank **Transfer Funds** window.

__ b. For the From Account enter **101,** for the To Account enter **102**, and for the amount enter **10**.

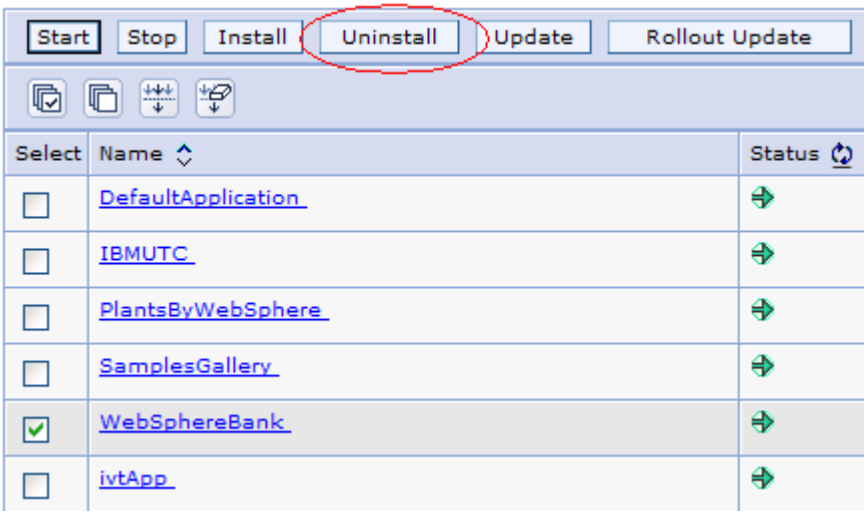
__ c. Click **Transfer**.

__ d. Notice the correct amount is transferred. The application update is complete.

Part 9: Cleanup

In this section you will uninstall the WebSphereBank application.

____ 1. In the Admininstrative console, under **Applications > Enterprise Applications**, select the **WebSphereBank** application and click on **Uninstall**.



____ 2. Click **OK**.

____ 3. Click **Save** in the banner at the top of the page.

____ 4. Click the **Save** button.

____ 5. You can now close your browser.

What you did in this exercise

In this exercise, you updated a J2EE 1.4 application using both partial(.war, .zip and single file) and full(.ear file) update methods.