

Lab SL05
WebSphere Application Server - Express V5:
Configuration and Administration



ITSO iSeries Technical Forum 2003

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Lab 1

WebSphere Application Server Express for iSeries Administration Lab

Objectives

The objective of this lab is to familiarize yourself with the newly announced WebSphere Application Server Express for iSeries (WAS Express) product. WAS Express is a highly functional, easy to implement Web application server for allowing iSeries customers to quickly and affordably Web enable their business applications and data for competitive advantage and seizing new business opportunities.

Each student team will create their own WAS Express environment and explore many of its capabilities. You will get a chance to deploy applications, understand the different administrative tools and learn how to administer WAS Express in your own environment. Each team will be operating in their own unique WAS Express environment (often referred to as an instance) on the same iSeries server. This replicates a 'real world' scenario where there is a need for separate production, development and test environments to be maintained.

For most WAS Express configuration and administrative tasks, you can use the browser based HTTP administration console (you may have used in other projects). WAS Express also includes its own full function, browser based administrative console. You will use both console applications as part of this lab.

Refer to your tent card or lab setup sheet for the system name, user ID, password, ports, etc. to use in this lab.

Lab environment

The following infrastructure has been set up for you:

- ▶ an iSeries server capable of running WAS Express for iSeries
- ▶ OS/400 V5R2 with the latest cumulative PTF package
- ▶ IBM HTTP Server Powered by Apache (5722-DG1)
- ▶ WAS Express for iSeries (5722-IWE) base, and options 2 & 3
- ▶ WAS Express for iSeries PTF package (SF99271)

Time required

The time required to efficiently complete this lab project is 3-4 hours, depending on your current skill level with WebSphere Application Server concepts.

Task summary

In this lab, you perform the following tasks:

1. Create your own WAS Express and Apache HTTP server instances
2. Test your instance via the WAS Express Internal HTTP Server
3. Test your instance, the Apache HTTP server
4. Familiarize yourself with the integrated WAS Express administrative console
5. Install a prebuilt database query application
6. Create a JDBC datasource
7. Activate the full function WAS Express administrative console
8. Setup your WAS Express Instance to enable multiple language encodings (needed for WebFacing)
9. Restart your WAS Express Instance and verify it is operating properly
10. Test the database query application
11. View the iSeries job information
12. View the WAS Express log files.
13. Regenerate the HTTP server plugin from the full function administrative console
14. Create a JDBC provider & datasource to support WebSphere Studio Version 4 applications
15. Install a prebuilt WebSphere Studio Version 4 application
16. Restart your WAS Express Instance & verify that the database query application works
17. Familiarize yourself with the IBM Telephone Directory Application
18. Familiarize yourself with the management scripts
19. Familiarize yourself with the WAS Express Trace facility

Task 1: Create your own WAS Express and Apache HTTP server instances

You will create your own WAS Express and HTTP Server instance via the HTTP Server administration application you should already be familiar with:

- ___ 1. Open up a Web browser session on your workstation. Go to the following URL:
<http://server:2001> (where server is the iSeries host or TCP/IP address)
- ___ 2. You should be at the iSeries Tasks Web page, as shown in Figure 1-1.



Figure 1-1 iSeries HTTP Administration Application

- ___ 3. Click the **IBM HTTP Server for iSeries** link.
- ___ 4. Note the different page tabs (Welcome, Setup, Manage, TCM and Related Links). Select the **Setup** tab, if it is not already selected.
- ___ 5. At the Setup page, observe the navigation frame on the left side. Locate the **Tasks and Wizards** category and click the links a few times to familiarize yourself with how to expose and hide the various options (see Figure 1-2).



Figure 1-2 Tasks and Wizards show/hide options

- ___ 6. Select the **Create New Express Server** option from the Tasks and Wizards category.
- ___ 7. You should see a **Create New Express Server** welcome type page, with sections entitled Virtual Hosts, Install Application, and Data Sources and JDBC Providers. Click the **Next** button.
- ___ 8. The next screen lets you specify your application server name. Enter your particular server name (i.e. WASXX where XX is your team number) and click the **Next** button.

Note: Make sure you use upper case letters for the server name. Server name is case sensitive.

- ___ 9. The next screen lets you specify if you want to create a new Apache HTTP server or use an existing one. Select the default to create a new HTTP server.
- ___ 10. Click the **Next** button
- ___ 11. Specify your HTTP server name and the associated TCP/IP port (i.e. apachexx & 5xx00 as shown in Figure 1-3, where xx is your team number). Refer to your lab setup sheet if necessary.

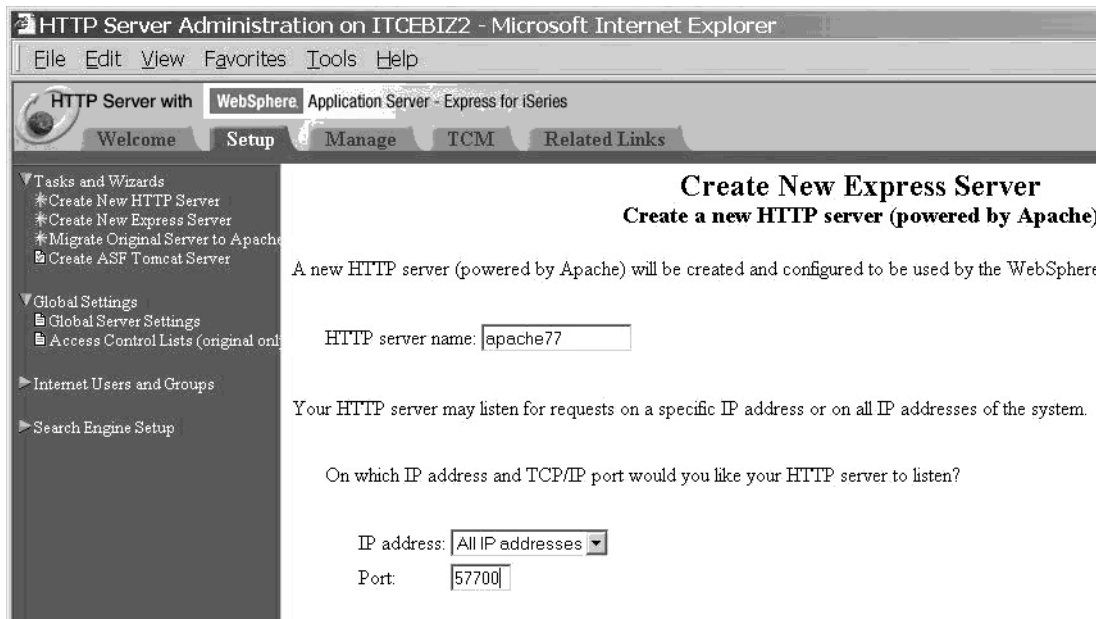


Figure 1-3 Define HTTP Server Port

- ___ 12. Click the **Next** button.
- ___ 13. The next screen lets you specify the TCP/IP ports your WAS Express instance will use. Note that WAS Express requires 12 consecutive, unused ports for its internal operation. Enter your particular starting port number, as indicated on your tent card or lab setup sheet (i.e. 5xx01, where xx is your team number).
- ___ 14. Click the **Next** button.
- ___ 15. The next screen lets you specify which business and sample applications you want to install. Ensure you select the **ExpressSamples** and **IBM Telephone Directory** applications.
- ___ 16. Click the **Next** button.
- ___ 17. The next screen lets you verify your WAS Express application server settings. Double-check your application server name and the TCP/IP port settings to ensure they are correct. You should see a screen similar to one shown in Figure 1-4.

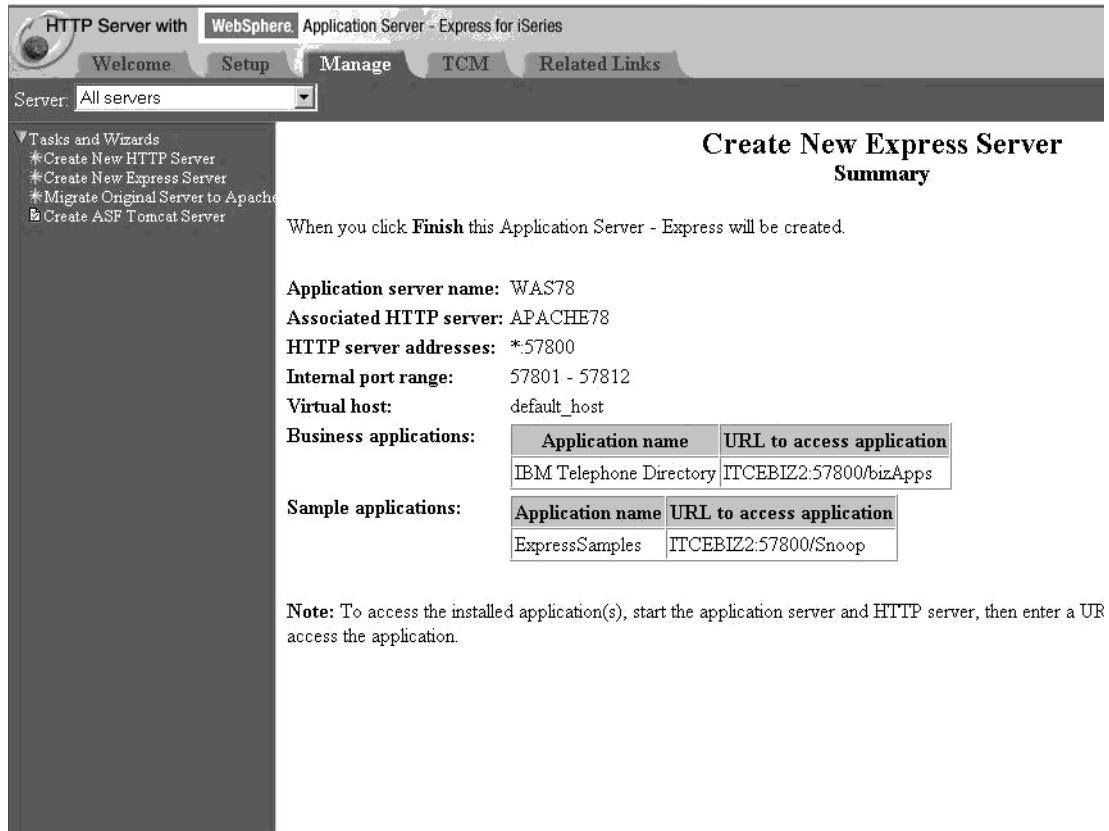


Figure 1-4 Create New Express Server Summary

- ___ 18. After verifying your settings are correct, click the **Finish** button.
- ___ 19. Depending on the size of the iSeries server used in the class and how many other students are doing the lab, it may take 5 or more minutes for your instance to be created. Now would be a good time to take a look at the WAS Express infrastructure that has already been set up for you.

Intermediate Step - Verify System Prerequisites

For this lab, WAS Express and all necessary prerequisite software such as PTF's have been installed. The next few steps will walk you through ensuring the infrastructure is set up properly for getting WAS Express operational on your iSeries server.

Refer to your tent card or lab setup sheet for your specific team number, the system name, user ID, password, ports, etc.:

- ___ 1. Sign on to a 5250 session on the iSeries server being used for this class. At the command line, enter **GO LICPGM** and press enter.
- ___ 2. Select option 10 (Display installed licensed programs) and press enter.
- ___ 3. At the Display installed licensed programs screen, scroll down until you see licensed program **5722IWE**.
- ___ 4. Note that there are two or more items displayed. Press the F11 key once or twice to display the installed release and product options parameters.

- ___ 5. Press the F3 key to exit back to a command line. At the command line, enter **WRKPTFGRP** and press the enter key. Note that there are a number of Group PTF's installed on the server. For OS/400 V5R2, these are some of the important Group PTF's from a WAS Express perspective:
 - i. SF99098 (HTTP Server)
 - ii. SF99169 (Java)
 - iii. SF99271 (WAS Express)

- ___ 6. Press the F3 key to exit back to a command line. At the command line, enter **WRKACTJOB** and press the enter key. Ensure that the QASE5 subsystem is active. The product installation, PTF load/apply and subsystem startup tasks must obviously be done prior to creating your first server instance and WAS Express infrastructure. Nevertheless, it is helpful to review these steps ahead of time because the proper infrastructure must be in place prior to trying to create any WAS Express server instances.

- ___ 7. The HTTP server ADMIN job will be consuming significant processor resources during this instance creation time. Please avoid the temptation to frequently refresh the screen at the WRKACTJOB command while your instance is being created, as it will only prolong the completion.

- ___ 8. After your WAS Express instance has been created, you should be in the Manage screen tab and see the Manage Application Server - Express "yourservername" screen as shown in Figure 1-5. Note that a number of configuration options can be selected from the main panel, in addition to the left navigation frame.

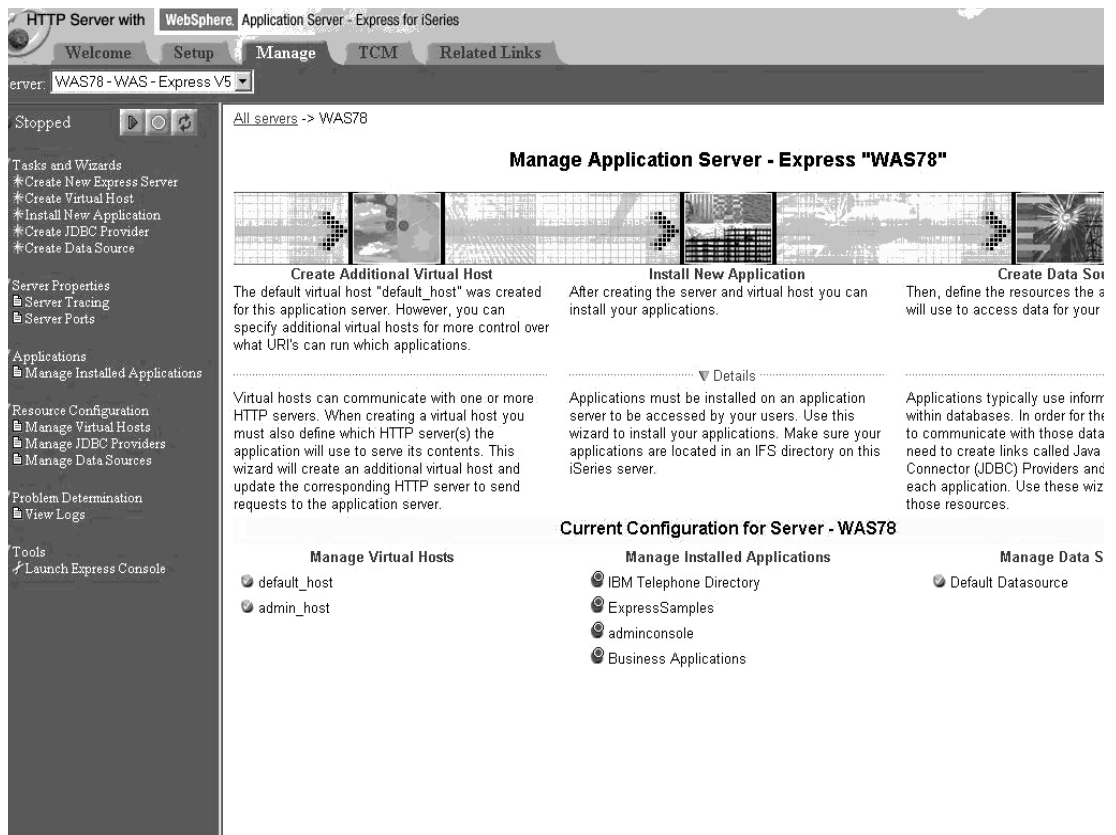


Figure 1-5 Manage the newly created WAS Express server

- ___ 9. Locate the server administration buttons at the top of the left navigation frame (see Figure 1-6).

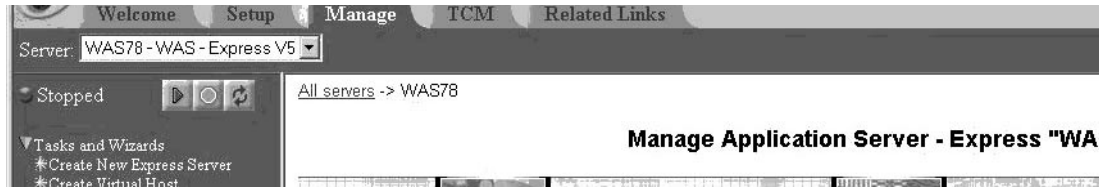


Figure 1-6 WAS Express server administration options

- ___ 10. Click the start button (the one with the green triangle).

Depending on the size of the iSeries server used in the class and how many other students are doing the lab, it will take a minute or two for your instance to start. You can periodically (every 10 seconds or so) click the refresh button to determine when your application server has started.

- ___ 11. If all goes well, your server should now be started (see Figure 1-7).

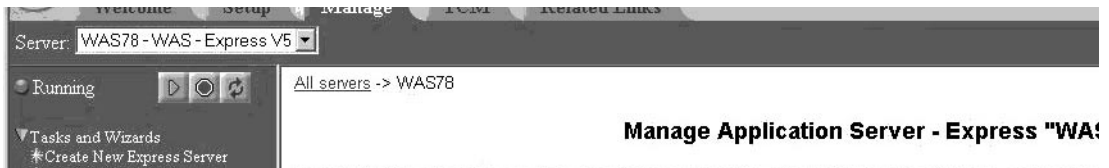


Figure 1-7 WAS Express server has been started

- ___ 12. Your next step is to run a test application to determine if your server was setup correctly.

Task 2: Test your instance via the WAS Express Internal HTTP Server

In this step you will test your Express instance using its internal HTTP server port, and the sample application you installed in Task 1: "Create your own WAS Express and Apache HTTP server instances" on page 2. You will perform this task in two steps. First, you will need to know the internal HTTP server port that your Express instance is using. Second, you will then use this to try running the snoop test servlet.

- ___ 1. At the Express configuration console, click the **Manage Virtual Hosts** option under the Resource Configuration category

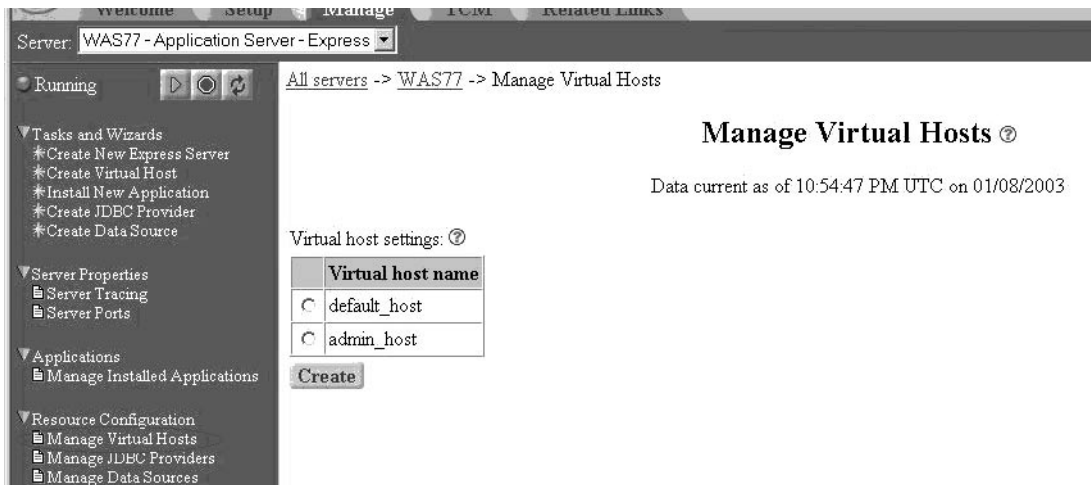


Figure 1-8 Virtual Host Configuration

- ___ 2. You should see two entries - **default_host** and **admin_host**. Select the **default_host** radio button option, then click the **Properties** button.

- ___ 3. You should now see two virtual host ports defined (i.e. 5xx00 & 5xx10).
 The port ending in 00 is for your Apache HTTP server. The port ending in 10 is your WAS Express internal HTTP server port. This is the port you will use to test your application server in the next task.
 Note: If your Apache HTTP server port is not listed or is incorrect, you will need to make the appropriate modifications within the default_host virtual host setting. Contact your instructor if you run into difficulties.

- ___ 4. Click **Manage Installed Applications**.

- ___ 5. You should see several applications (see Figure 1-9).

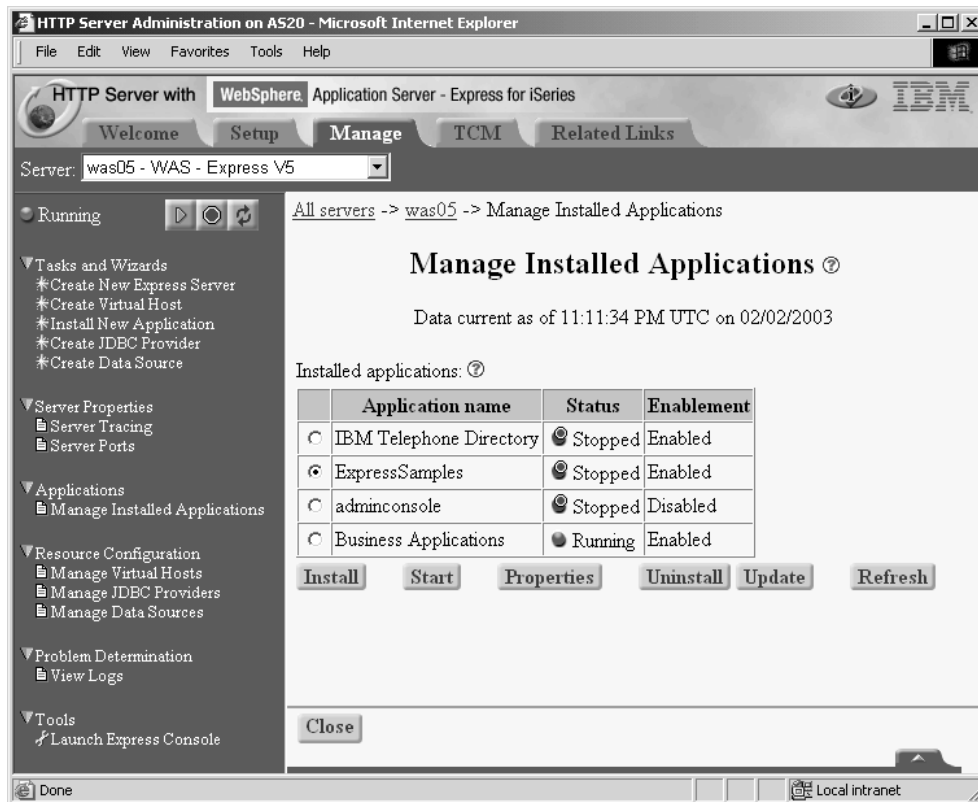


Figure 1-9 Installed applications

- ___ 6. Select **ExpressSamples** and click **Start**, if it's not started.
- ___ 7. Open up another Web browser session on your workstation (keep the current console session active). Go to the following URL to test your application server instance:


```
http://server:wasport/snoop
```

 where *server* is the iSeries host or TCP/IP address and *wasport* is the WAS internal HTTP server port you saw in the previous task.
- ___ 8. If all goes well, you should see the results of the 'snoop' servlet, indicating that your WAS Express instance is setup and operating correctly (see Figure 1-10).

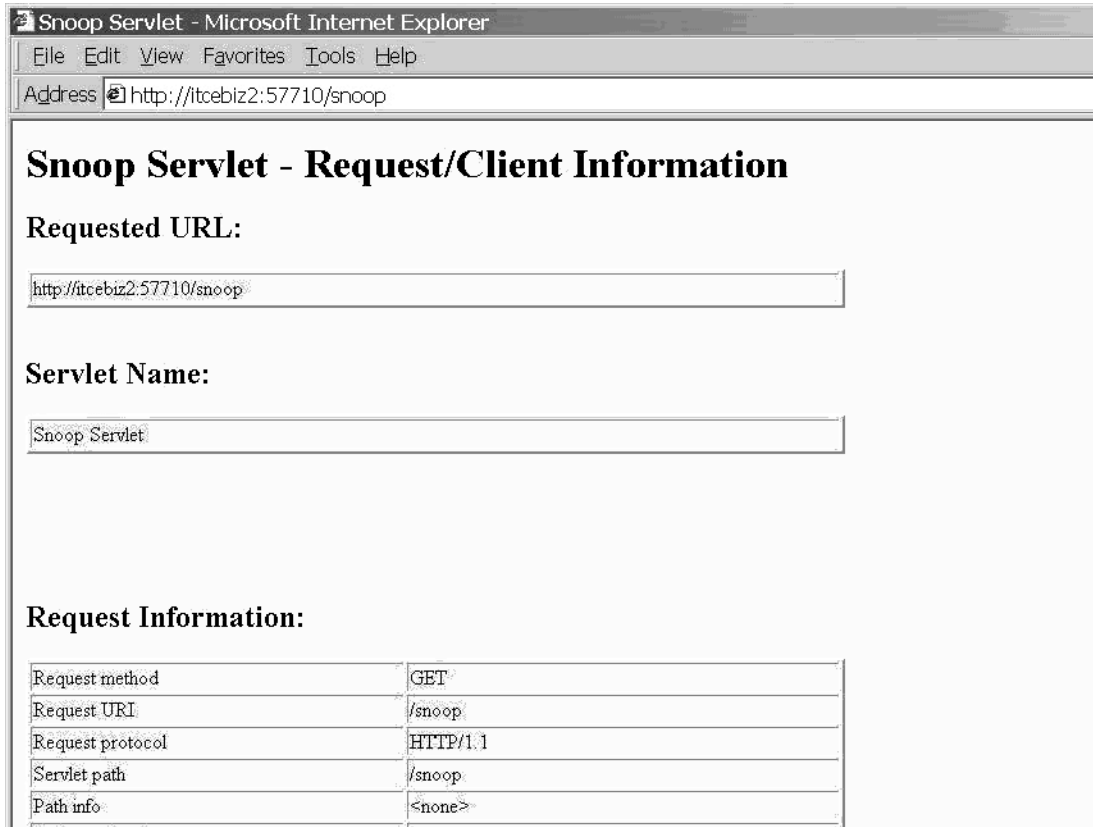


Figure 1-10 Results for the snoop diagnostic servlet

- ___ 9. Your next step is to run the same application, instead using your Apache HTTP server instance.

Task 3: Test your instance via the Apache HTTP server

In this step you will test your Express instance using the Apache HTTP server you created earlier, and the sample application you installed in Task 1: “Create your own WAS Express and Apache HTTP server instances” on page 2. This will determine if the linkage between your Apache HTTP server and WAS Express application server instances is setup and operating correctly.

You can use the same Web browser session you used in Task 2: “Test your instance via the WAS Express Internal HTTP Server” on page 7 to test your instance with the WAS Express internal HTTP server.

Since the IBM HTTP Server for iSeries powered by Apache has not been started, you will need to start it and verify it is operating properly:

- ___ 1. At the Express Administration console locate & select the server drop-down field, and select your HTTP server instance as shown in Figure 1-11

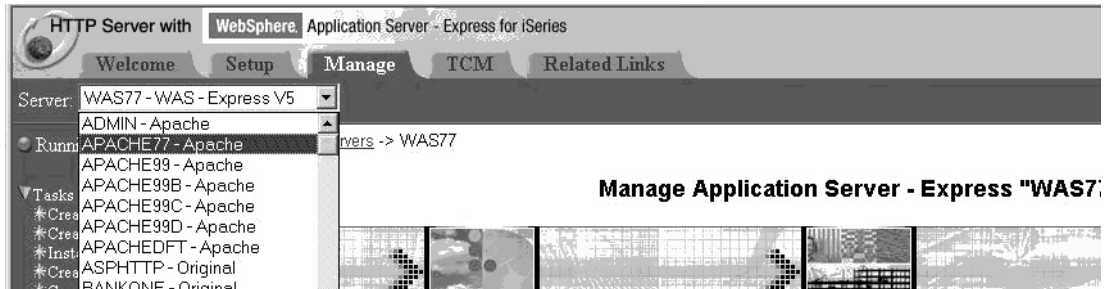


Figure 1-11 Select the appropriate HTTP server

2. You should be at the Manage Apache server screen as shown in Figure 1-12.

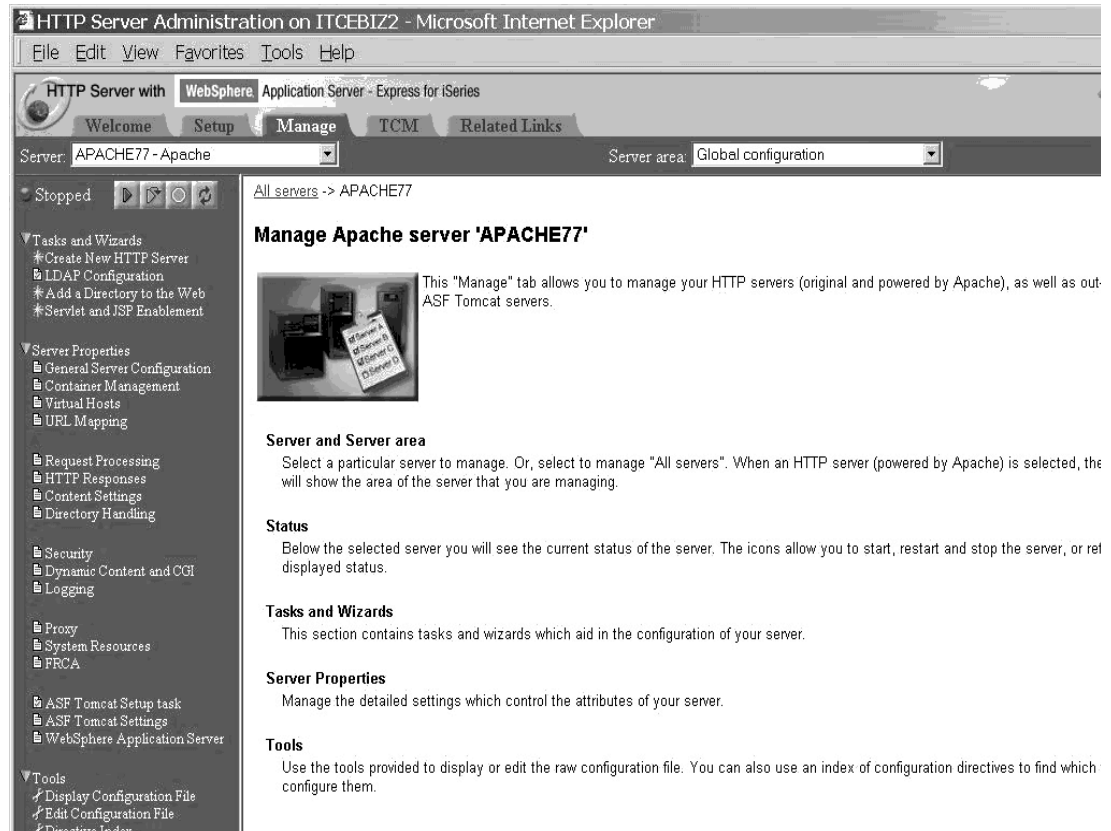


Figure 1-12 HTTP Server Configuration & Management Menu

3. Click the **Start** button (the one with the green triangle).

4. Wait a few seconds, then click the **Refresh** button (the one with blue arrows).

5. Ensure that the server status is **Running** (see Figure 1-13).

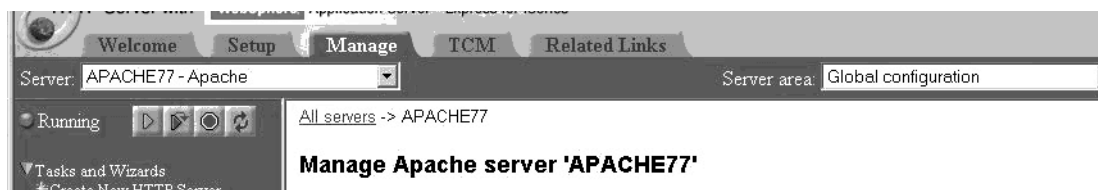


Figure 1-13 HTTP Server has started

- ___ 6. Go to the following URL to test your HTTP server instance:
 http://server:Webport
 where *server* is the iSeries host or TCP/IP address and *Webport* is the port for your Apache HTTP server.
- ___ 7. You should see the Apache HTTP server sample page.
- ___ 8. Next, go to the following URL to test your application server instance:
 http://server:Webport/snoop
 where *server* is the iSeries host or TCP/IP address and *Webport* is the port for your Apache HTTP server.
- ___ 9. If all goes well, you should see the results of the 'snoop' servlet, indicating that your WAS Express instance is setup and operating correctly.
 Note: If this task fails, contact your lab instructor for assistance.
- ___ 10. Your next step is to explore some of the other system administration capabilities within the integrated console application.

Task 4: Familiarize yourself with the integrated WAS Express administrative console

In this step you will look at additional administrative capabilities within the integrated console application:

- ___ 1. From the **Server** pull-down menu select your team's Express instance WASxx (where xx is your team number).
- ___ 2. At the Express configuration console, click the **Manage Installed Applications** option under the Applications category.
- ___ 3. Notice the installed applications and their status. Select the **ExpressSamples** option (see Figure 1-14).

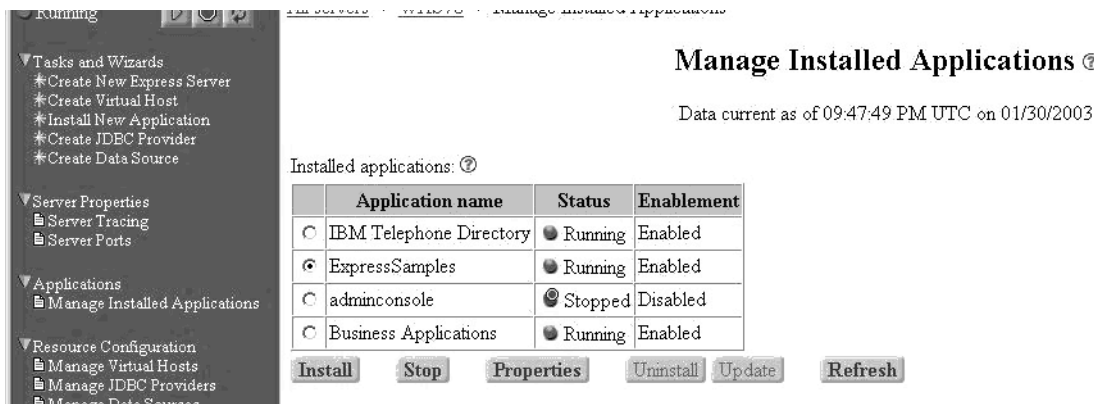


Figure 1-14 Manage Application Server Instance Applications

- ___ 4. Note the additional options for stopping the application or viewing the properties. Click the **Properties** button.

- ___ 5. You should now see an Application Properties page with two tabs - **General & Virtual Host Mapped to Web Modules**. In the General tab, note the location of the installed application.
- ___ 6. Click the **Virtual Host Mapped to Web Modules** tab.
- ___ 7. Notice that there is one Web module. Select the radio button next to the Web module name.
- ___ 8. Notice that you can now assign a different virtual host to this Web module.
- ___ 9. Ensure the virtual host remains **default_host** and then click the **Cancel** button. You may see a popup window asking you to confirm that you will be exiting the form and that any changes will be lost. Click the **OK** button.
- ___ 10. At the Express configuration console, click the **Server Ports** option under the Server Properties category.
- ___ 11. You should see a table listing several services and their associated TCP/IP ports (see Figure 1-15). Notice the two Admin service ports. There are also HTTP transport services for these ports also. This is for the full function browser console. The first port is for HTTP (non-secure), the second port is HTTPS (secure).

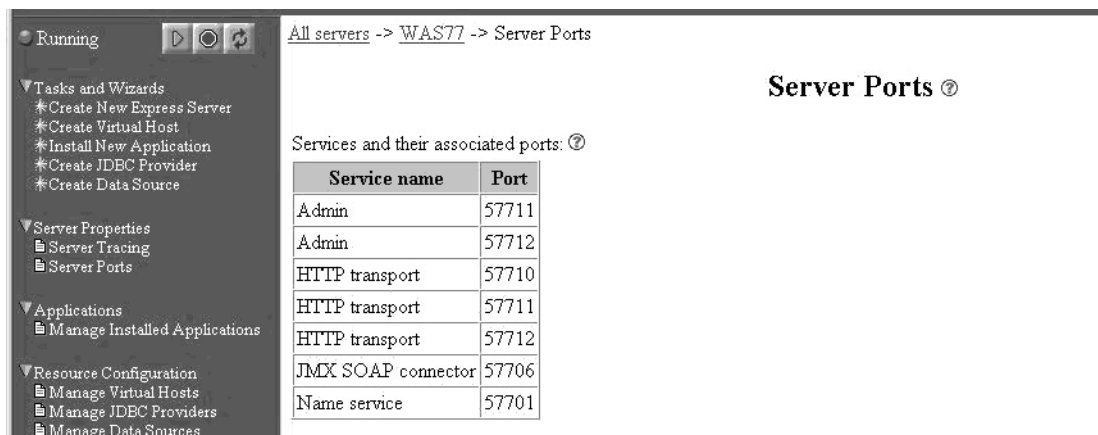


Figure 1-15 View the application server ports

- ___ 12. You should also see the port for your internal WAS Express HTTP server, and a few others.

Task 5: Install a prebuilt database query application

It is assumed that both your WebSphere Application Server and its associated instance of an HTTP Server Powered by Apache are up and running. If they are not, please restart them and ensure that they are operating correctly by executing the snoop Servlet.

A new Web Application needs to be created. In addition, a supporting JDBC Driver and Datasource need to be defined. These tasks will be completed through the use of the OS/400 integrated WebSphere Express administration console application:

- ___ 1. At the Express configuration console, click the **Manage Installed Applications** option under the Applications category.
- ___ 2. Click the **Install** button.

- ___ 3. You should be at the Specify Application Location screen. Click the **Application is contained in a WAR file** radio button. Note that the screen changes, allowing you to specify the IFS path of the WAR file, and context root.
- ___ 4. Click the **Browse** button. Locate the **stdxx_5.war** file in your team's exprXX directory on the iSeries server (see Figure 1-16), where XX is your team number.

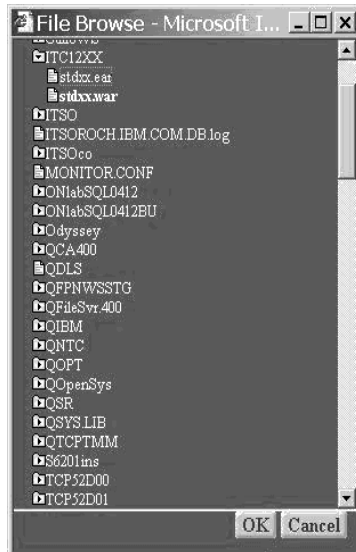


Figure 1-16 Choose the appropriate application archive file

- ___ 5. Click the **OK** button
- ___ 6. You should be at the Specify Application Location screen with the IFS path to the WAR file defined. In the **Context root** field enter `/stdxx_5` (NOTE: USE xx (lowercase), NOT YOUR TEAM NUMBER).
- ___ 7. Verify the context root is actually `/stdxx_5` (again, use xx rather than your team number).
- ___ 8. Click the **Next** button.
- ___ 9. On the options to perform screen, take the defaults and click the **Next** button.
- ___ 10. Accept the **default_host** as the virtual host & click the **Next** button.
- ___ 11. At the summary page click the **Finish** button (see Figure 1-17).

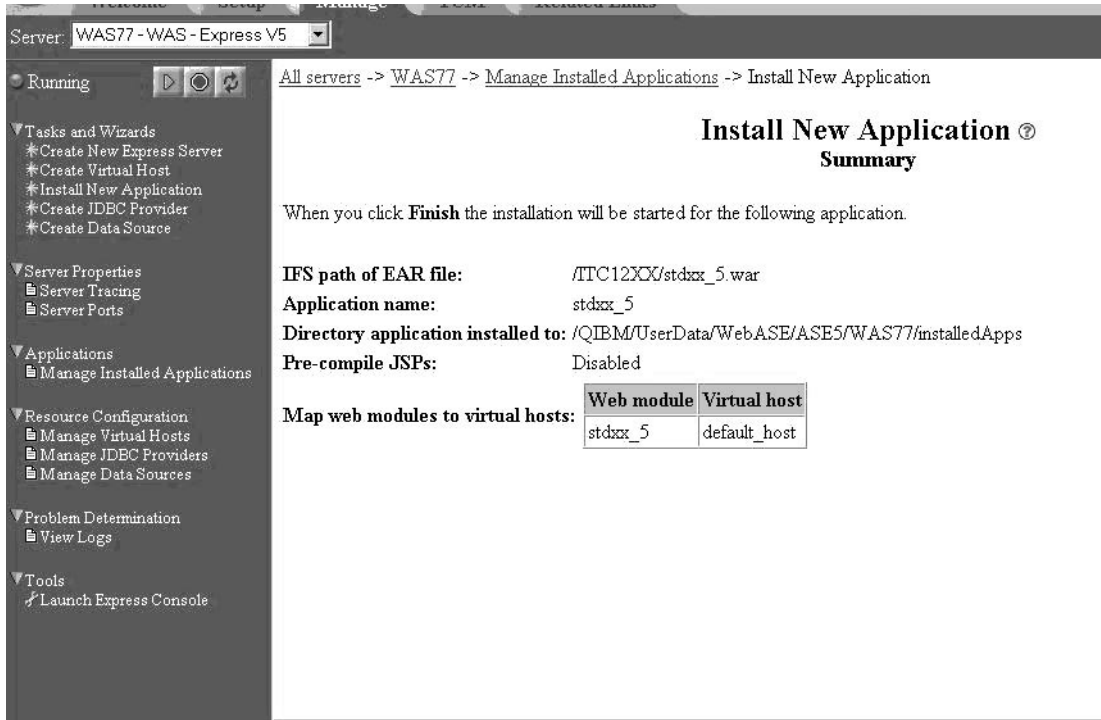


Figure 1-17 Application installation summary

12. The application will now be installed and you should be back at the Managed Installed Applications screen. You should see the application having an 'Installing' status as shown in Figure 1-18.

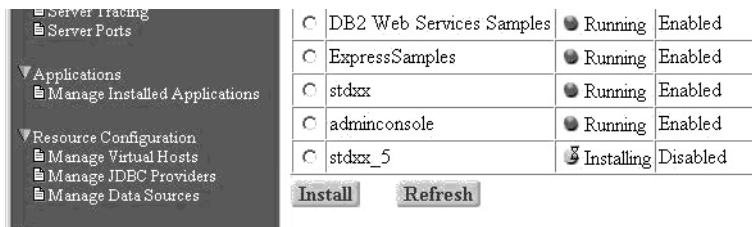


Figure 1-18 Application being installed to the server

13. You can periodically (every 10 seconds or so) click the refresh button to determine when your application has been enabled.
14. After the application has been enabled, select the radio button next to the application name.
15. Click the **Start** button.
16. Depending on the size of the iSeries server used in the class and how many other students are doing the lab, it may take a few seconds for your console application to start. Eventually you should see the status change to **Running**, as shown in Figure 1-19.

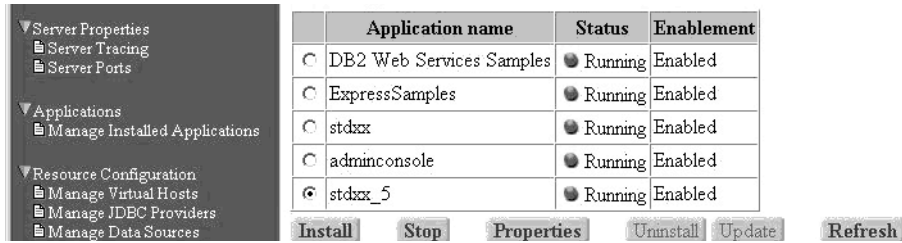


Figure 1-19 Application has started

Task 6: Create a JDBC datasource

Now that the application has been installed and started, you must configure the appropriate JDBC DataSource infrastructure for your WAS Express instance.

Because this application was built with WebSphere Studio Version 5, you can configure the JDBC DataSource infrastructure from either the OS/400 integrated, or the full function WAS Express administrative console. You will use the OS/400 integrated administrative console version in this exercise.

- ___ 1. At the integrated browser console, click the **Create DataSource** option under the Tasks and Wizards category.
- ___ 2. You should see the Create Data Source panel come up, asking you to specify a DataSource name.
- ___ 3. Name your datasource stdxx_5 (don't substitute your team number for xx). Click the **Next** button.
- ___ 4. The next screen should be Select JDBC Provider. Select the **Select an existing JDBC provider** radio button and click the **Next** button.
- ___ 5. You should see two or more JDBC providers defined. Select the DB2/400 JDBC provider that is NOT XA and is NOT JTA enabled (see Figure 1-20).

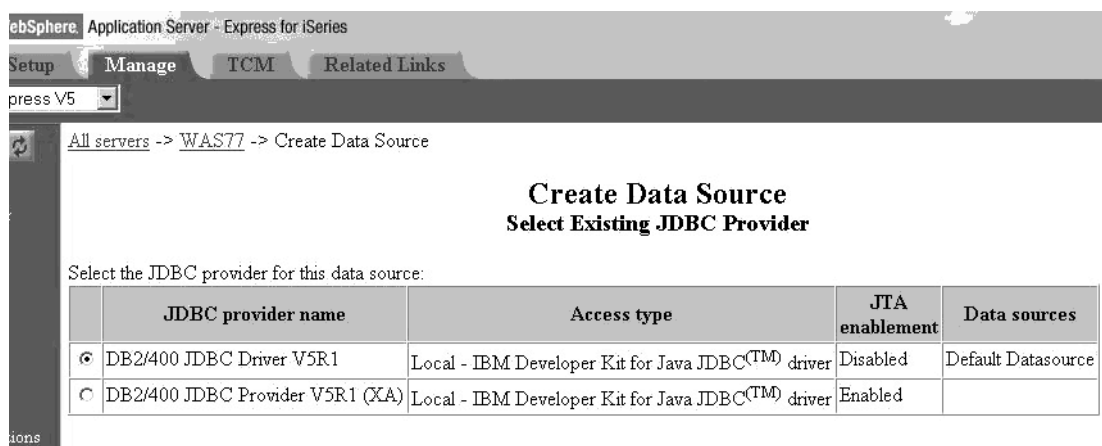


Figure 1-20 Choose the appropriate JDBC Provider

- ___ 6. Click the **Next** button and you should be at the Specify Database Information screen.
- ___ 7. Enter *LOCAL for the Database name parameter.

- ___ 8. Enter *LOCAL for the Collection, Schema or Library name parameter.
- ___ 9. Click the **Next** button.
- ___ 10. You should be at the Specify JNDI Name screen.
- ___ 11. Ensure that the JNDI name parameter is **jdbc/stdxx_5**.
NOTE: DO NOT SUBSTITUTE YOUR TEAM NUMBER FOR XX IN THIS CASE.
- ___ 12. Click the **Next** button and you should be at the Create DataSource summary screen (see Figure 1-21).

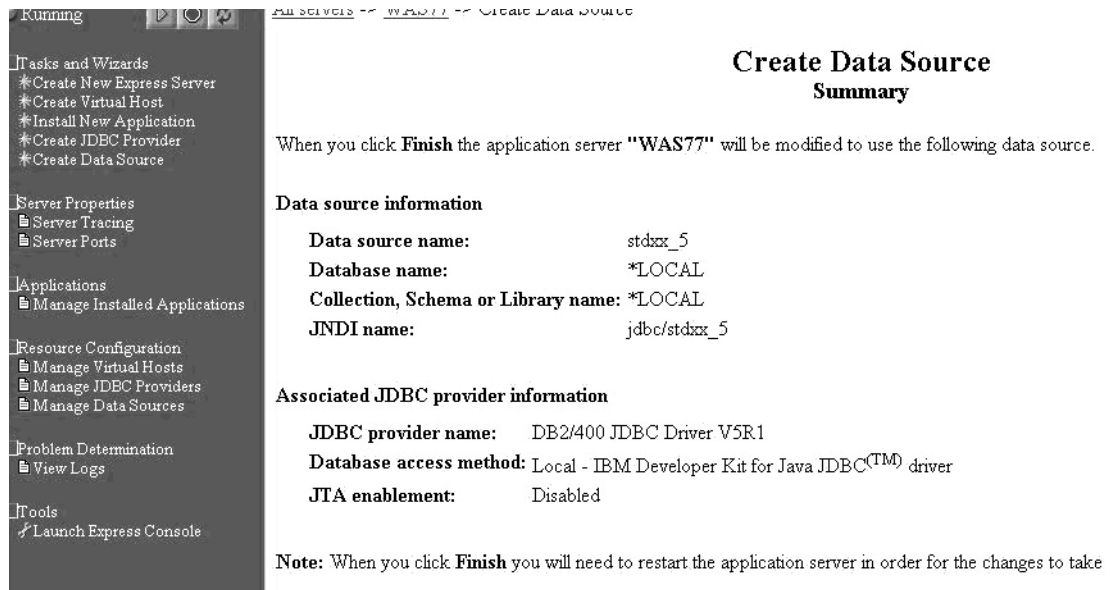


Figure 1-21 Create Data Source Summary

- ___ 13. Verify that your JDBC provider does not indicate XA. Verify that the JTA enablement is Disabled.
- ___ 14. After verifying everything is correctly defined, click the **Finish** button.
- ___ 15. You should be at the Manage Application Server - Express "yourservername" screen.
- ___ 16. Locate the **Manage Data Sources** section towards the bottom right hand section of the screen. Verify that data source **stdxx_5** is listed and has a checkmark icon next to it.
- ___ 17. The next step is to try running the application. However, there is one small step that needs to be done. In the Internet Explorer window click **Tools -> Internet Options**.
- ___ 18. Select the **Advanced** tab.
- ___ 19. Uncheck the **Show friendly HTTP error messages** option and click **OK**. If you leave this option on, the error message received during one of the next steps won't match the lab instructions.
- ___ 20. At a browser prompt enter the following URL, replacing <system_name> with the name of the system on the lab setup sheet, wasport with your HTTP server port (i.e. 5xx00). You will need to specify **stdxx_5** in the URL, as this must match the servlet context root:

http://<system_name>:wasport/stdxx_5/ItemSearchInputForm.html

- ___ 21. A Web input page should appear in your browser.
- ___ 22. Enter the values for the search condition of the SQL statement. Valid values are between 000001 to 000010. Click the **Submit** link to execute the query.
- ___ 23. It will take a moment or two for the application to execute since this is the first time it has been run.
- ___ 24. You will likely see an error message in the browser:


```
Error 500: SelectTag - select_master: Unexpected error;
javax.naming.NameNotFoundException: jdbc/stdxx_5
```
- ___ 25. The reason this error occurred is because the application server instance must be restarted after the JDBC Datasource is created. Since you did not perform this task, your WAS 5 Express instance can not resolve the JNDI lookup.

Before you restart your application server instance, you will do some additional configuration which also requires an application server restart. This way you can avoid the overhead of an additional server startup and shutdown.

Task 7: Activate the full function WAS Express administrative console

In this step you will enable the WAS Express full function administrative console. The browser based HTTP administration server you have been using thus far is typically adequate for all but the most complex WAS Express administrative tasks. By default, it is disabled. In this step you will enable the full function administrative console to provide advanced capabilities necessary to support subsequent lab exercises in this workshop.

- ___ 1. At the Express configuration console, click the **Manage Installed Applications** option under the Applications category.
- ___ 2. Notice the adminconsole application is stopped and in a disabled status. Select the **adminconsole** application option.
- ___ 3. Notice that there are additional option buttons that appear. Click the **Properties** button.
- ___ 4. The next screen should show an Application Enablement list box indicating Disabled, plus the OS/400 IFS location of the full function console application (make sure the **General** tab is selected). Select the **Enabled** option (see Figure 1-22), then click the **OK** button.

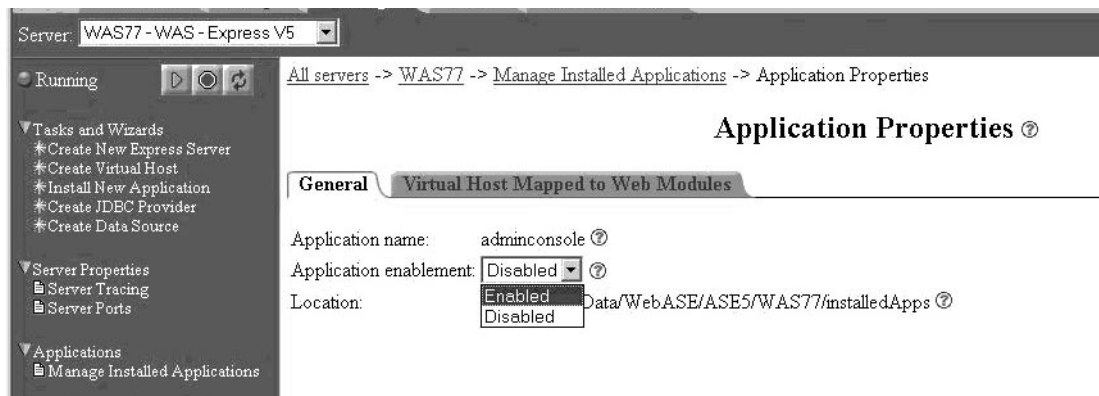


Figure 1-22 Enable the administrative console application

- ___ 5. It may take a few seconds for the application to become enabled. You should now be at the Manage Installed Applications screen.
- ___ 6. The adminconsole application should now be **Enabled**.
- ___ 7. Click the **Start** button.
- ___ 8. Depending on the size of the iSeries server used in the class and how many other students are doing the lab, it may take a few seconds for your console application to start. Eventually you should see the status change to **Running**.
- ___ 9. After the adminconsole application is started, you can now use it to enable multiple language encoding support. Click the **Launch Express Console** option under the Tools category (Figure 1-23).

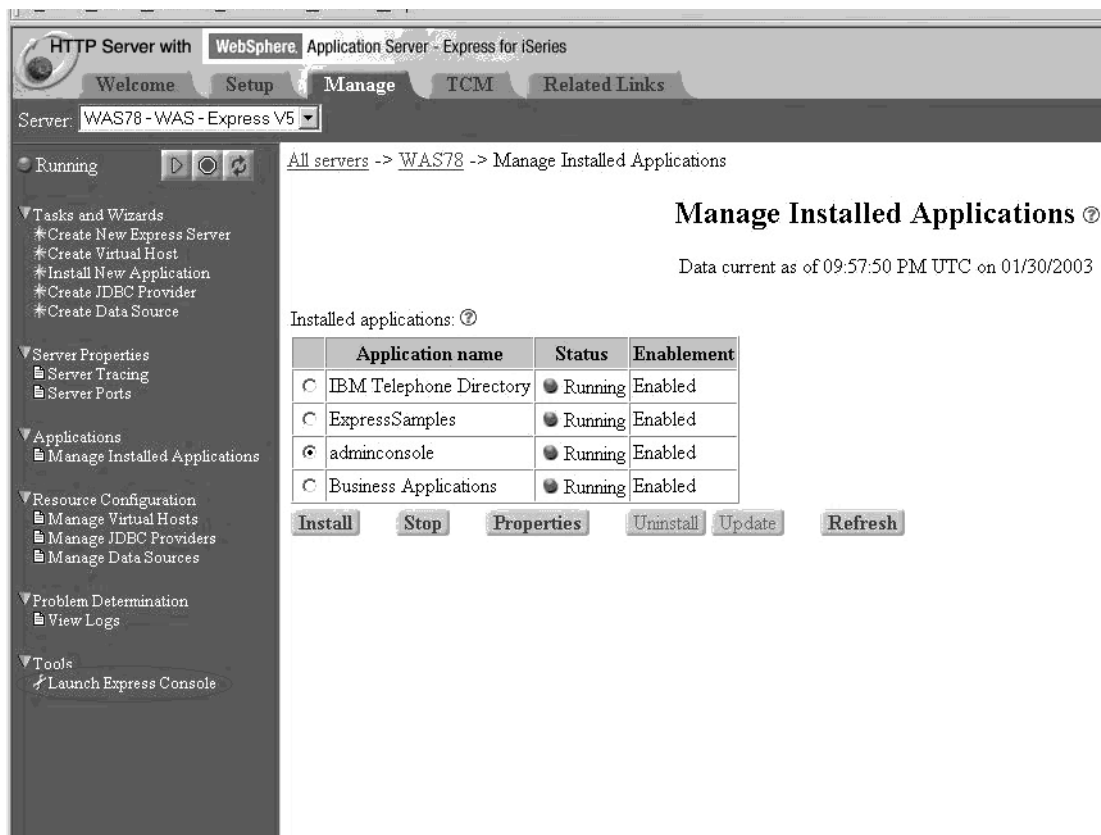


Figure 1-23 Start the full function administrative console from the integrated console application

- ___ 10. You should see another browser window pop up, taking you to the full function administrative console application.

Task 8: Setup your WAS Express Instance to enable multiple language encodings

Your next step is to enable your application server to support multiple language (UTF-8) encoding. This step is necessary in order to support applications built with the IBM WebFacing tool, or any others requiring multiple language character support:

1. Depending on the size of the iSeries server used in the class and how many other students are doing the lab, it may take a few seconds for your console application to appear. Eventually you should see the console logon screen as shown Figure 1-24.

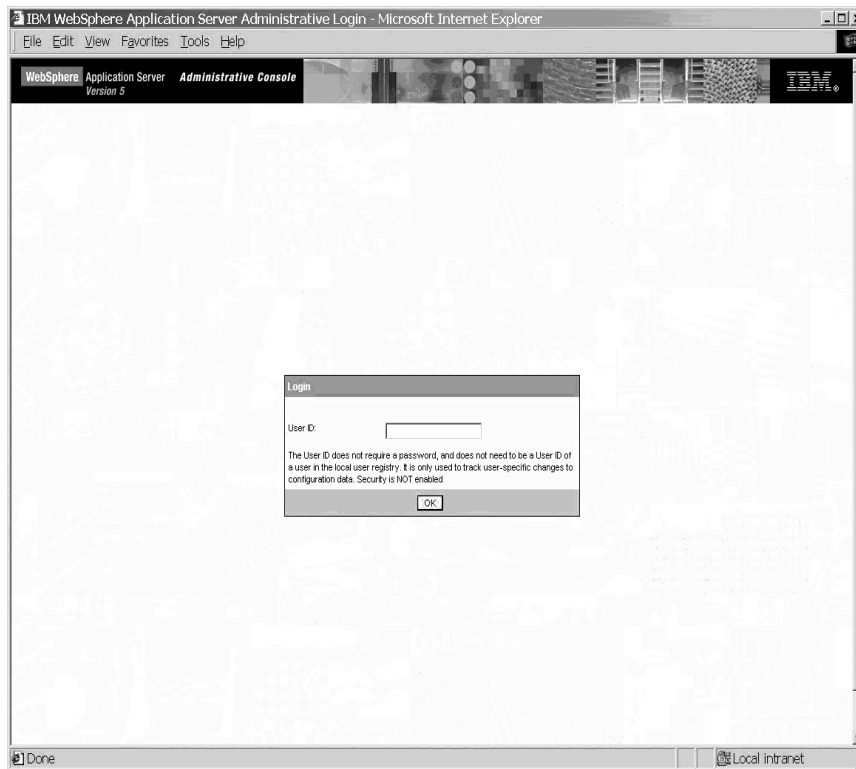


Figure 1-24 WAS Administrative Console Logon

2. Enter your iSeries user ID and click the **OK** button.
3. The first time the administrative console application is run, it will take a moment or two for it to come up. Please be patient. You should eventually see the console 'home page', as shown in Figure 1-25.

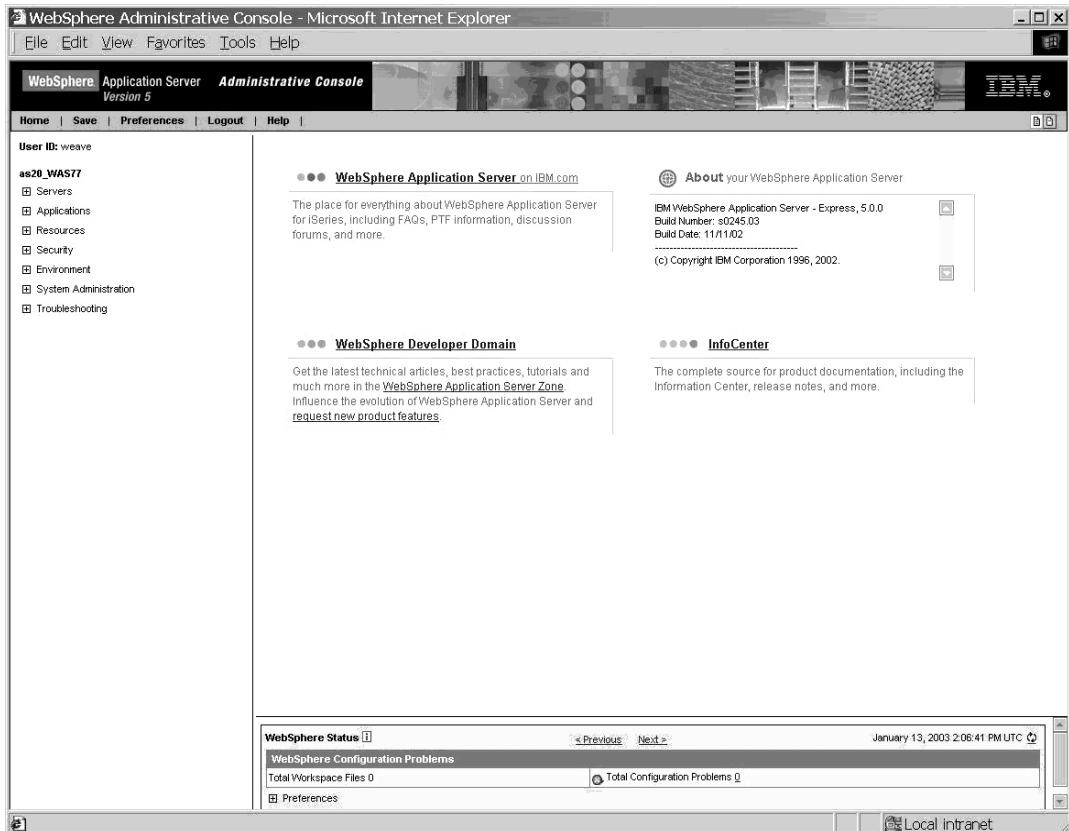


Figure 1-25 Administrative Console

- ___ 4. Within the navigation frame on the left side of the browser window, notice the User ID - parameter you entered and your node name.
- ___ 5. Under the server name, click the **Servers** option and you should see an **Application Servers** option.
- ___ 6. Click the **Application Servers** link. It may take a moment or two for the page to come up. Please be patient.
- ___ 7. You should see your application server and node listed, as shown Figure 1-26.

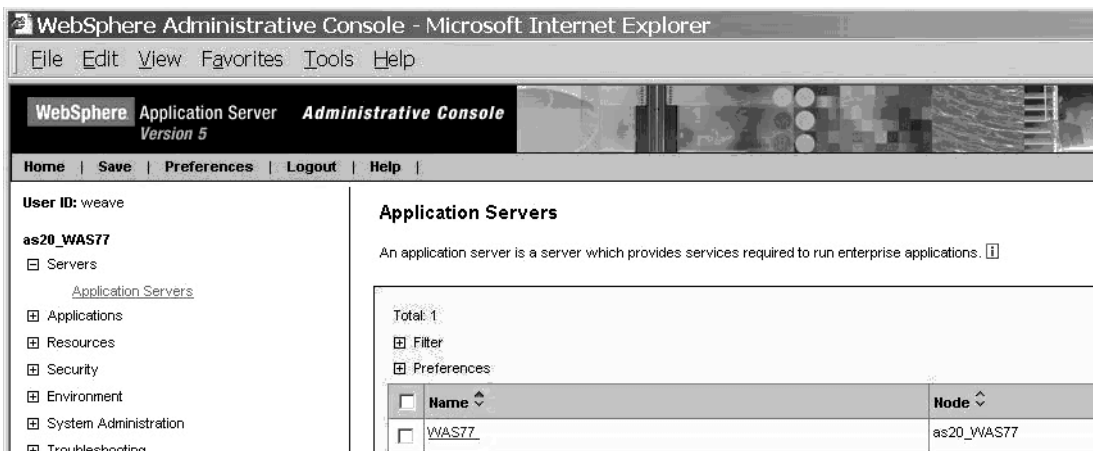


Figure 1-26 Application Server Instance

- ___ 8. Click the application server link (i.e. WAS77 in the preceding diagram). It may take a moment or two for it to come up. Please be patient.
- ___ 9. You should see a list of general properties and additional properties on the Configuration tab. Scroll through the list and locate the **Process Definition** option. Click this link.
- ___ 10. You should see a list of general properties and additional properties on the **Configuration** tab. Click the **Java Virtual Machine** link in the **Additional Properties** section (see Figure 1-27).

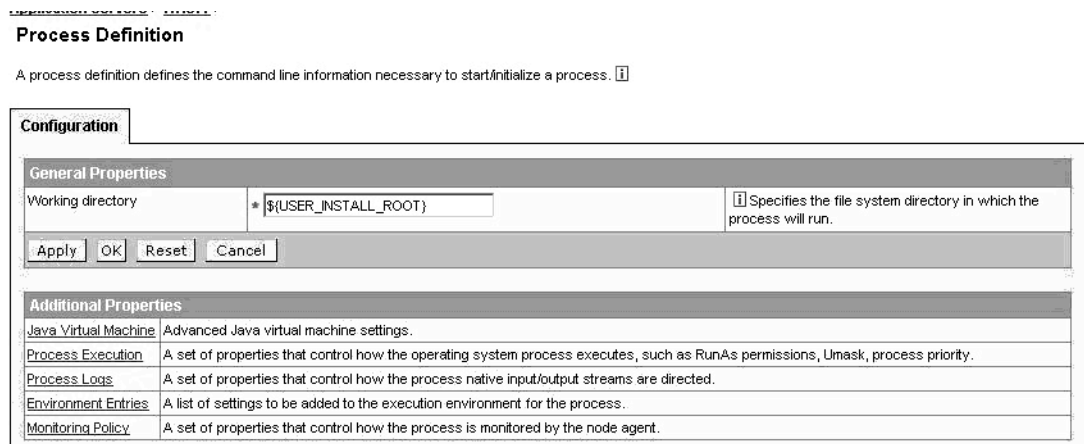


Figure 1-27 Select the Java Virtual Machine properties

- ___ 11. You should see a list of general properties and additional properties on the Configuration tab. There are two options for setting the encoding override - the Generic JVM arguments field in the general properties section, or via the Custom Properties link in the additional properties section. In this lab, you will use the Custom Properties option. Click the **Custom Properties** link.
- ___ 12. You should see the **Custom Properties** panel, with none currently defined. Click the **New** button.
- ___ 13. For the custom properties entry, specify a Name of `client.encoding.override` (in lower case) and Value of `UTF-8` (in upper case) as shown in Figure 1-28.

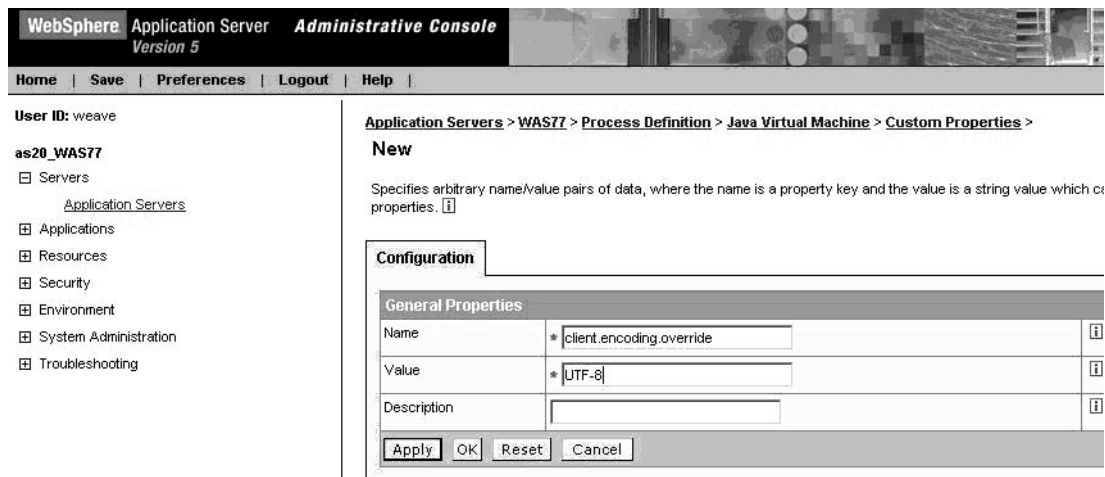


Figure 1-28 Set the appropriate encoding override

- ___ 14. Click the **OK** button.
- ___ 15. You should be back at the Java Virtual Machine configuration page. Note the message at the top of the window, indicating that you have made changes and must save them in order for it to take effect.
- ___ 16. Click the **Save** link.
- ___ 17. You should see a **Save to Master Configuration** option screen appear. Click the **Save** link.
- ___ 18. After confirming the configuration save, you should be back at the main administrative console screen. Click the **Logout** option in the toolbar at the top of the window.
- ___ 19. Changes to the JVM require the application server be restarted. Your next step is to go back to the integrated console, restart your application server instance, and verify that it is operating properly.

Task 9: Restart your WAS Express Instance and verify it is operating properly

- ___ 1. Go back to your console session within the HTTP server administration application.
- ___ 2. Click the **Stop** button (see Figure 1-29).



Figure 1-29 Stop the Application Server

- ___ 3. You can periodically (every 10 seconds or so) click the refresh button to determine when your application server has stopped.
- ___ 4. Click the start button (the one with the green triangle). Depending on the size of the iSeries server used in the class and how many other students are doing the lab, it will take a minute or two for your instance to start. You can periodically (every 10 seconds or so) click the refresh button to determine when your application server has started.
- ___ 5. After your application server has restarted, repeat the tasks in Task 2:; “Test your instance via the WAS Express Internal HTTP Server” on page 7 & Task 3:; “Test your instance via the Apache HTTP server” on page 10 to ensure you can run the snoop servlet via the WAS Express internal HTTP server port and the Apache external HTTP server port.

Task 10: Test the database query application

Now that you have restarted your application server, you should be able to test the database query application you installed in Task 5:; “Install a prebuilt database query application” on page 13:

- ___ 1. At a browser prompt enter the following URL, replacing <system_name> with the name of the system on the lab setup sheet and wasport with your HTTP server port (i.e. 5xx00).

http://<system_name>:wasport/stdxx_5/ItemSearchInputForm.html

2. A Web page, such as one shown in Figure 1-30, should appear in your browser.

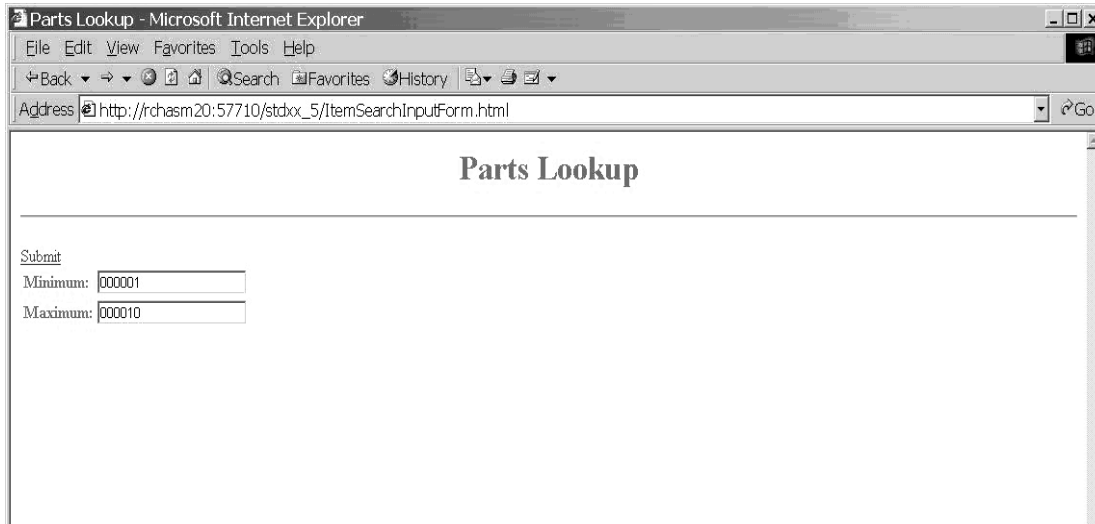


Figure 1-30 Sample Application Input Page

3. Enter the values for the search condition of the SQL statement. Valid values are between 000001 to 000010. Click the **Submit** link to execute the query.
4. The next figure shows the results for a minimum of 000004 and maximum of 000008 (see Figure 1-31).

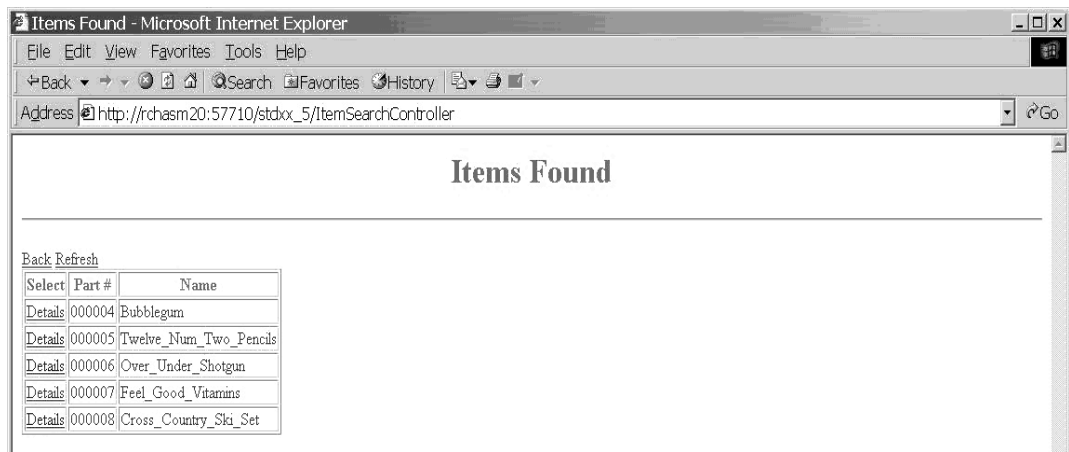


Figure 1-31 Sample Application Output Page

5. Select one of the items and click the **Details** link to execute the next query.

Now that you have tested your database query application, your next step will be to look through some of the iSeries job information.

Task 11: View the iSeries job information

In the intermediate step at the beginning of the lab you observed that the OS/400 QASE5 subsystem was operational prior to creating your WAS instance. In this step you will view the OS/400 job log information.

- ___ 1. Sign on to a 5250 session on the iSeries server being used for this class. At the command line, enter **WRKACTJOB** and press enter.
- ___ 2. Scroll through the job activity until you find subsystem QASE5.
- ___ 3. Locate your particular server job (i.e. WASXX, where XX is your team number) and choose option 5 (work with job).
- ___ 4. Select option 10 to work with the job log. Press the F10 key to view the detailed job information.
- ___ 5. Locate the message “WebSphere application server yourservername ready.”
- ___ 6. Place the cursor on this message line and press the F1 key to display the detailed message.
- ___ 7. The message should state which port or ports that administrative requests can be handled.

Question 1: Which port(s) are listed?

- ___ all ports the server is listening on
- ___ only the secure and nonsecured full function administrative console ports
- ___ only the nonsecured full function administrative console port

Answer: It should be only the nonsecured full function administrative console port (i.e. 5xx11 where xx is your team number).

Task 12: View the log files within the integrated console

- ___ 1. At the Express configuration console, click the **View Logs** option under the Problem Determination category.
- ___ 2. Note the 4 different log files and their location in the OS/400 IFS (see Figure 1-32).

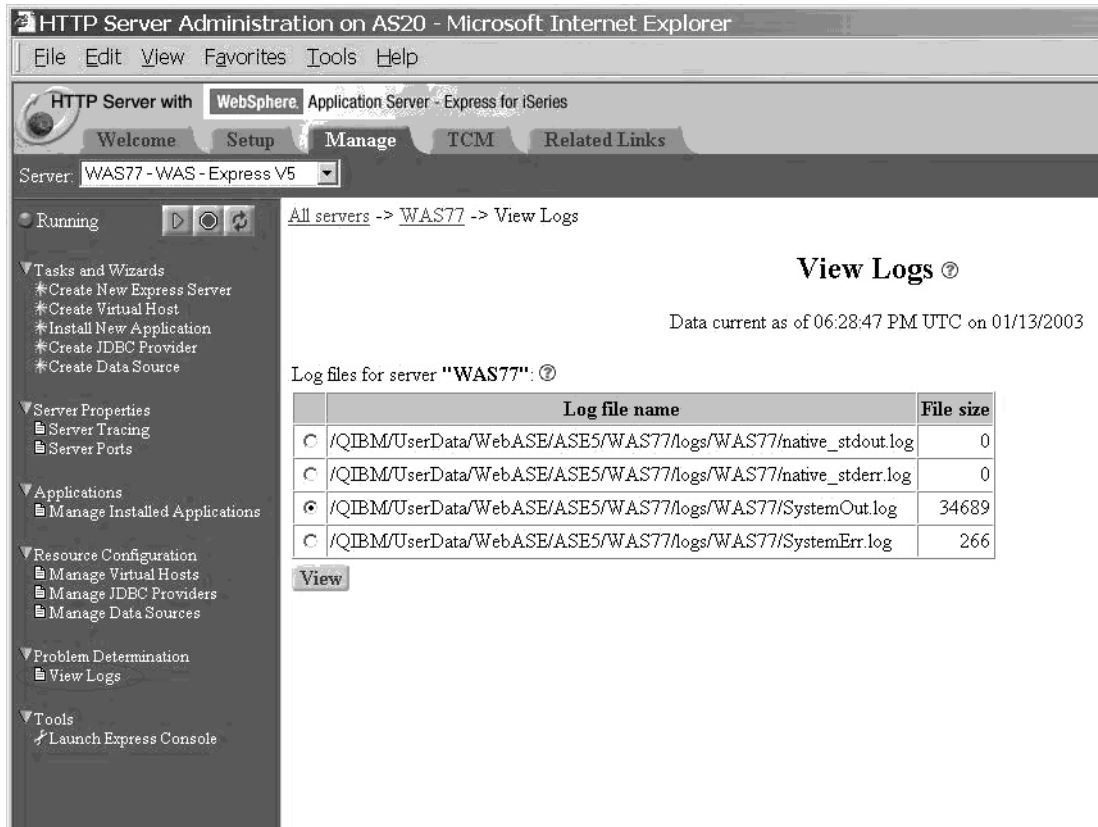


Figure 1-32 Access the log files from the integrated console

___ 3. Select the **SystemOut.log** file and press the **View** button.

___ 4. A new window should pop up, showing you the log file contents.

___ 5. Use the log file to answer the following questions.

Hint: Scroll to the bottom of the listing, then scroll upwards to find the last application server startup section.

Java 2 security is ___enabled ___disabled

What service is listening on port 5xx01?

Which applications have been started?

Which port is utilizing the HTTPS transport?

What servlet & JSP versions does your application server support? ___servlet ___JSP

The answers are on the next page.

Java 2 security is ___enabled ___x___disabled

What service is listening on port 5xx01? ___RMI Connector_____

Which applications have been started? ___ adminconsole & ExpressSamples_____

Which port is utilizing the HTTPS transport? ___5xx12 (the secure admin console port)

What servlet & JSP versions does your application server support? 2.3_servlet
1.2_JSP

Task 13: Regenerate the HTTP server plugin from the full function administrative console

The WAS Express integrated console application will automatically regenerate the HTTP Server plugin file for events such as installing a new application. The full function administrative console you used in Task 6: “Create a JDBC datasource” on page 16 to set the UTF-8 encoding does not automatically regenerate the plugin. In this step you will learn how to manually regenerate the HTTP server plugin within the full function administrative console:

- ___ 1. If you still have the full function console window open from Task 6: “Create a JDBC datasource” on page 16, use that session. Otherwise, from the integrated console application, Click the **Launch Express Console** option under the Tools category.
- ___ 2. You should see another browser window pop up, taking you to the full function administrative console application.
- ___ 3. Enter your iSeries user ID and click the **OK** button.
- ___ 4. The first time the administrative console application is run, it will take a moment or two for it to come up. Please be patient. You should eventually see the console 'home page'.
- ___ 5. Under the server name, click the **Environment** option and you should see an **Update Web Server Plugin** option (see Figure 1-33).



Figure 1-33 Update the HTTP server plugin from the administrative console

- ___ 6. Click the **Update Web Server Plugin** link. In a moment or so you should see the Update Web server plugin configuration screen.
- ___ 7. Click the **OK** button to manually regenerate the plugin. You should see a confirmation message at the top of the window indicating that the task was successful (Figure 1-34).



Figure 1-34 HTTP server plugin updated

- ___ 8. Click the **View** or **Download** the current Web server plugin configuration file link.
- ___ 9. Note that the plugin file is in XML (eXtensible Markup Language). Also, note the TCP/IP port settings for the WAS Express internal HTTP server task and the external Apache HTTP server task.
- ___ 10. Expand the **Servers** category.
- ___ 11. Click the **Application Servers** link, then in the right frame click your server name link.
- ___ 12. On the next page click the **Web Container** property.
- ___ 13. View the **HTTP Transports** property. Note that there are ports defined for the WAS Express internal HTTP server, and the two ports for the full function administrative console.
- ___ 14. If you have time, feel free to browse through some of the other categories. **DO NOT MAKE ANY CHANGES AT THIS TIME!**
- ___ 15. When you have finished browsing through the administrative console options, ensure you logout of the session.

Task 14: Install a prebuilt WebSphere Studio Version 4 application

It is assumed that both your WebSphere Application Server and its associated instance of an HTTP Server Powered by Apache are up and running. If they are not, please restart them and ensure that they are operating correctly by executing the snoop Servlet.

A new database query oriented Web application will be now be installed. This application was created with WebSphere Development Studio Client V4 for iSeries. The database connection pooling supported in WebSphere Studio V4 is different from the V5 products. In this step you will install the application. In the following step you will create the appropriate JDBC Datasource.

These tasks will be completed through the use of both browser based WebSphere Express administration console applications.

- ___ 1. At the Express configuration console, click the **Manage Installed Applications** option under the Applications category.
- ___ 2. Click the **Install** button.
- ___ 3. You should be at the Specify Application Location screen. Click the **Application is contained in a WAR file** radio button. Note that the screen changes, allowing you to specify the IFS path of the WAR file, and context root.
- ___ 4. Click the **Browse** button. Locate the **stdxx.war** file in your exprXX directory on the iSeries server (where XX is your team number).

Note: The selected item in the Browse window is shown in bold.

- ___ 5. Click the **OK** button.
- ___ 6. You should be at the Specify Application Location screen with the IFS path to the WAR file defined. In the **Context root** field enter **/stdxx** (NOTE: USE xx (lowercase), NOT YOUR TEAM NUMBER).
- ___ 7. Verify the context root is actually **/stdxx** (again, use xx rather than your team number; see Figure 1-35).



Figure 1-35 Define the new application to be installed

- ___ 8. Click the **Next** button.
- ___ 9. On the options to perform screen, take the defaults and click the **Next** button.
- ___ 10. Accept the **default_host** as the virtual host & click the **Next** button.
- ___ 11. At the summary page click the **Finish** button (see Figure 1-36).

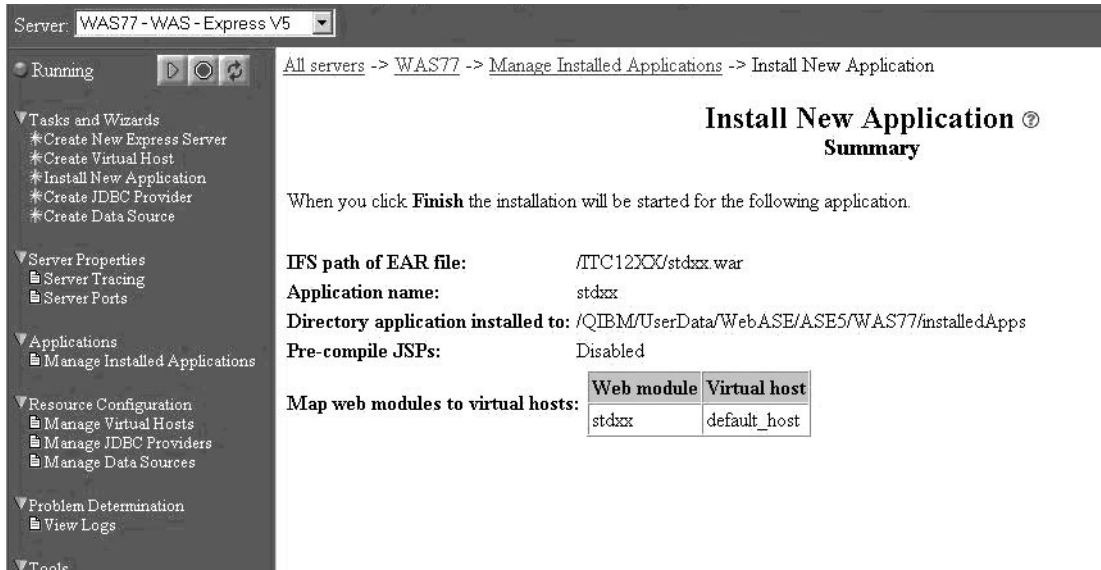


Figure 1-36 Install the new application

- ___ 12. The application will now be installed and you should be back at the Managed Installed Applications screen. You should see the application having an 'Installing' status.
- ___ 13. You can periodically (every 10 seconds or so) click the refresh button to determine when your application has been enabled.
- ___ 14. After the application has been enabled, select the radio button next to the application name.
- ___ 15. Click the **Start** button.
- ___ 16. Depending on the size of the iSeries server used in the class and how many other students are doing the lab, it may take a few seconds for your console application to start. Eventually you should see the status change to **Running**, as shown in Figure 1-37.

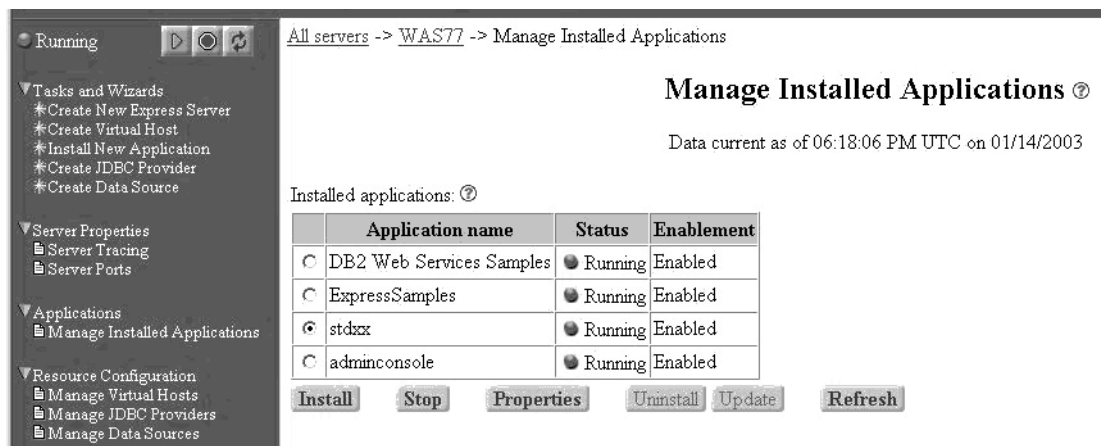


Figure 1-37 Application installed & started

Now that the application has been installed and started, you must configure the appropriate JDBC DataSource infrastructure for your WAS Express instance. Because this application was built with WDSVC Version 4, you must configure the JDBC DataSource infrastructure from the full function WAS Express administrative console.

Task 15: Create a JDBC provider & datasource to support a WebSphere Studio Version 4 application

1. At the integrated browser console, click the **Launch Express Console** option under the Tools category.
2. You should see another browser window pop up, taking you to the full function administrative console application.
3. Log in and then expand the **Resources** category and click the **JDBC Providers** link (see Figure 1-38).

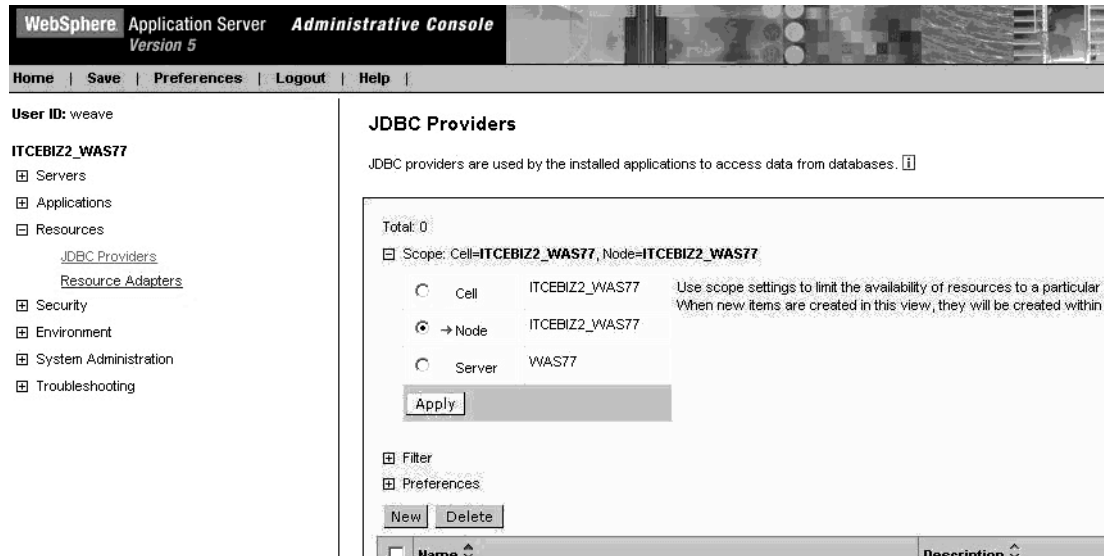


Figure 1-38 Configure JDBC Providers & Data Sources

4. Click the **New** button
5. You will see a General Properties panel with a drop-down list of JDBC providers. Select the **DB2 UDB for iSeries (Native - V5R2 and later)** option (see Figure 1-39).
6. After selecting the iSeries JDBC provider, click the **OK** button.

Configuration		
General Properties		
Scope	* cells:ITCEBIZ2_WAS77:nodes:ITCEBIZ2_WAS77	The scope of the configured resource. This value indicates the configuration location for the configuration file.
Name	* DB2 UDB for iSeries (Native - V5R2	The name of the resource provider.
Description	IBM Developer Kit for Java JDBC Driver for local DB2 connections on iSeries. This driver is not recommended for remote access. The jar file for this driver is /QIIBM/ProdData/Java400/ext/db2_classes.jar	A text description for the resource provider.
Classpath	#{OS400_NATIVE_JDBC_DRIVER_PATH};db2_classes.jar	A list of paths or JAR file names which together form the location for the resource provider classes. Classpath entries are separated by using the ENTER key and must not contain path separator characters (such as ";" or "."). Classpaths may contain variable (symbolic) names which can be substituted using a variable map. Check your drivers installation notes for specific JAR file names which are required.
Native Library Path		An optional path to any native libraries (.dll's, .so's). Native path entries are separated by using the ENTER key and must not contain path separator characters (such as ";" or "."). Native paths may contain variable (symbolic) names which can be substituted using a variable map.
Implementation Classname	* com.ibm.db2.jdbc.app.UDBConnectio	The Java classname of the JDBC driver implementation.
<input type="button" value="Apply"/> <input type="button" value="OK"/> <input type="button" value="Reset"/> <input type="button" value="Cancel"/>		

Figure 1-39 Define the JDBC provider

- ___ 7. You should be at the DB2 UDB for iSeries (Native - V5R2 and later) definition page. View the Classpath parameter. Note that it refers to variable **OS400_NATIVE_JDBC_DRIVER_PATH**. You will verify the value of this variable later.
- ___ 8. Also, observe the **Implementation Classname** parameter. This is different from the one used in the OS/400 V5R1 and earlier JDBC provider.
- ___ 9. Click on the **OK** button after observing the parameters.
- ___ 10. You should see a set of messages at the top of the next screen as shown in Figure 1-40.

Message(s)
Changes have been made to your local configuration. Click Save to apply changes to the master configuration.
The server may need to be restarted for these changes to take effect.
The classpath attribute contains a variable (begins with \$). Please make sure this variable is defined, by going to Environment --> Manage WebSphere Variables, for each physical machine the JDBCProvider will be used on (node).

Figure 1-40 Save the configuration after creating a JDBC provider

- ___ 11. Note that:
 - i. you need to save your configuration
 - ii. you may need to restart your server
 - iii. you need to ensure the environment variable is set correctly
- ___ 12. Click the **Save** link.
- ___ 13. At the Save to Master Configuration panel click the **Save** button.
- ___ 14. You should be back at the Administrative Console 'homepage'. Click the **JDBC Providers** link.

- ___ 15. You should see your DB2 UDB for iSeries (Native - V5R2 and later) provider defined. Click this link.
- ___ 16. Scroll down the **Configuration** panel to the **Additional Properties** section.
- ___ 17. Notice two types of Data Sources - standard and Version 4. Read through the descriptions for each (see Figure 1-41).

Additional Properties	
Data Sources	Data Source is used by the application to access the data from the database. A data source is created under a JDBC provider which provides the specific JDBC driver implementation class.
Data Sources (Version 4)	This is the WebSphere 4.x data source that uses the WebSphere old ConnectionManager architecture. All the EJB1.x modules must use this data source.

Figure 1-41 Create a Data Source for the JDBC provider

- ___ 18. Since our application was built with WDCS Version 4 and the 'WebSphere old ConnectionManager architecture', you will need to create a Version 4 Data Source. Click the **Data Sources (Version 4)** link.
- ___ 19. You should be at the Data Sources (Version 4) page. Click the **New** button.
- ___ 20. In the configuration panel enter the following parameters (see Figure 1-42):

Name: WSSClassDS
 JNDI Name: jdbc/WSSClassDS
 Database Name: *LOCAL

Configuration		
General Properties		
Scope	* cells:ITCEBIZ2_WAS77:nodes:ITCEBIZ2_WAS77	<small> ⓘ The scope of the configured resource. This value indicates the configuration location for the configuration file.</small>
Name	* WSSClassDS	<small> ⓘ The required display name for the resource.</small>
JNDI Name	jdbc/WSSClassDS	<small> ⓘ The JNDI name for the resource.</small>
Description	New DB2 Datasource	<small> ⓘ An optional description for the resource.</small>
Category		<small> ⓘ An optional category string which can be used to classify or group the resource.</small>
Database Name	*LOCAL	<small> ⓘ The database name that is used by a WebSphere 4.0 data source instance to get a connection.</small>
Default User ID		<small> ⓘ The user ID to use for connecting to the database.</small>
Default Password		<small> ⓘ The password used for connecting to the database.</small>
<input type="button" value="Apply"/> <input type="button" value="OK"/> <input type="button" value="Reset"/> <input type="button" value="Cancel"/>		

Figure 1-42 Define the Data Source

- ___ 21. Do not change any of the other parameters. When finished, click the **OK** button.
- ___ 22. You should see a couple of messages at the top of the screen indicating you need to save your changes, and the server may need to be restarted for the changes to take effect.
- ___ 23. Click the **Save** link.
- ___ 24. At the Save to Master Configuration panel click the **Save** button.

- ___ 25. You should be back at the Administrative Console 'homepage'. Your next task is to verify the OS400_NATIVE_JDBC_DRIVER_PATH environment variable path specified in your JDBC provider.
- ___ 26. Expand the **Environment** category and click the **Manage WebSphere Variables** link.
- ___ 27. Note the numerous environment variables that have been defined. Locate the **OS400_NATIVE_JDBC_DRIVER_PATH** environment variable and note the value (or IFS location).
- ___ 28. Your next step is to verify that the IFS path referred to in the prior step is correct. You can use a network drive mapped to the iSeries server, or the WRKLNK command from an interactive session.
- ___ 29. Verify that file **db2_classes.jar** exists in the directory.
- ___ 30. Your last task is to regenerate the HTTP server plugin.
- ___ 31. Under the server name, click the **Environment** option and you should see an **Update Web Server Plugin** option.
- ___ 32. Click the **Update Web Server Plugin** link. In a moment or so you should see the Update Web server plugin configuration screen.
- ___ 33. Click the **OK** button to manually regenerate the plugin. You should see a confirmation message at the top of the window indicating that the task was successful.
- ___ 34. Click the **Logout** task on the toolbar to log off of the administrative console session.
- ___ 35. Now that you have the JDBC datasource defined, you can restart your WAS Express instance and test your application.

Task 16: Restart your WAS Express Instance & verify that the database query application works

Refer to the steps in Task 9:, "Restart your WAS Express Instance and verify it is operating properly" on page 23 to stop and start your WAS Express application server instance.

- ___ 1. At a browser prompt enter the following URL, replacing <system_name> with the name of the system on the lab setup sheet, wasport with your HTTP server port (i.e. 5xx00). You will need to specify stdxx in the URL, as this must match the servlet context root:

```
http://<system_name>:wasport/stdxx/ItemSearchInputForm.html
```
- ___ 2. A Web page, such as one shown in Figure 1-43, should appear in your browser.

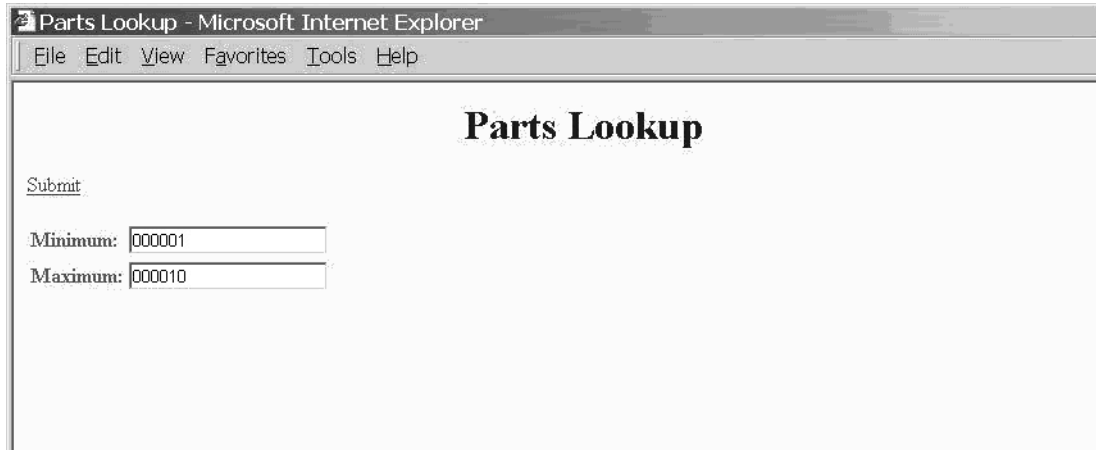


Figure 1-43 Web application input page

- ___ 3. Enter the values for the search condition of the SQL statement. Valid values are between 000001 to 000010. Click the **Submit** link to execute the query.
- ___ 4. The next figure shows the results for a minimum of 000004 and maximum of 000008 (see Figure 1-44).



Figure 1-44 Web application results

- ___ 5. Select one of the items and click the **Details** link to execute the next query.

Task 17: Familiarize yourself with the IBM Telephone Directory Application

In this next set of tasks you will explore using the IBM Telephone Directory application which is available with WebSphere Express Application Server for iSeries. You will first look at the necessary infrastructure, which your instructor has already put in place. Then, you will work with the application and do some directory queries and updates.

The IBM Telephone Directory application relies upon a Lightweight Directory Access Protocol (LDAP) enabled repository that actually holds the telephone book data. The LDAP support also enables having the appropriate security in place.

- ___ 1. Open up an iSeries Navigator session on your workstation.

- ___ 2. Expand the My AS/400 Connections link and locate the iSeries system being used for the lab.
- ___ 3. Expand the options under the system name (click the + sign).
- ___ 4. Locate and expand the **Network Option** (click the + sign).
- ___ 5. Locate and expand the **Servers** option, then expand the **TCP/IP** option (see Figure 1-45).

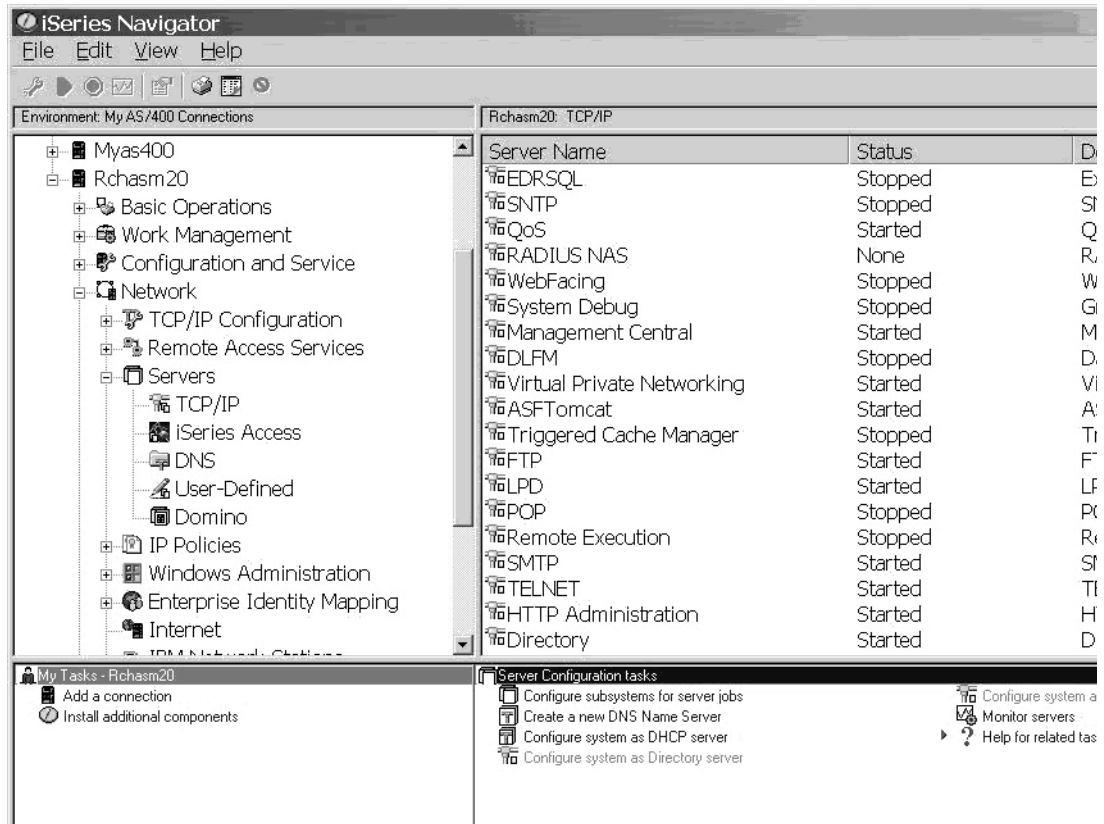


Figure 1-45 Manage TCP/IP servers via iSeries Navigator

- ___ 6. Locate the **Directory** server task within the TCP/IP category.
- ___ 7. Right mouse click the **Directory** server task and select the **Properties** option.
- ___ 8. A Directory Properties window should pop up. Click the **Database/Suffixes** tab (see Figure 1-46).

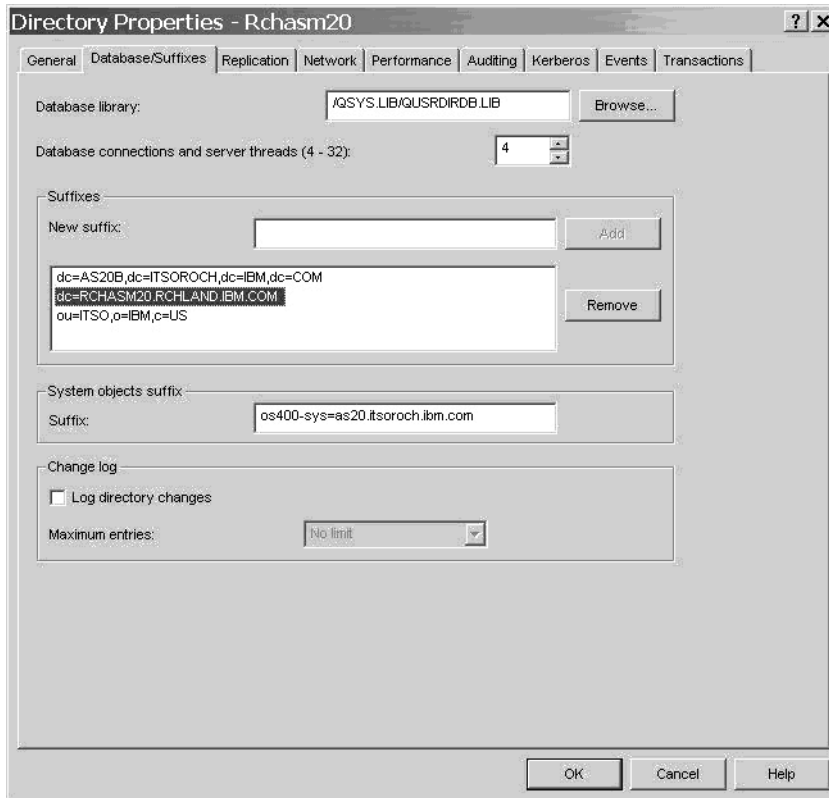


Figure 1-46 View Directory Services (LDAP) suffixes

- ___ 9. Record the suffix having the form dc=server,dc=domain,dc=ibm,dc=com.

- ___ 10. This is the suffix being used for entries in the telephone directory.
- ___ 11. Click the **Cancel** button on the Directory Properties window, then exit out of iSeries Navigator.
The next set of tasks have you view the directory entries.
- ___ 12. Your next step is to view your team's current entry in the directory. You will use the ldapsearch utility within the OS/400 Qshell environment to do this.
- ___ 13. Open up an interactive 5250 session to the iSeries server being used for the lab.
- ___ 14. At the command line enter command STRQSH and press the enter key. This will take you to the Qshell environment.
- ___ 15. At the Qshell prompt enter the following command to view the entries in the directory, replacing <directory suffix> with the directory suffix you recorded earlier:

```
ldapsearch -b <directory suffix> 'cn=*' /cn
```

- ___ 16. Here is an example, based upon the iSeries used in the illustrations (server rchasm20, suffix dc=as20,dc=itsoroch,dc=ibm,dc=com)

QSH Command Entry

```
> ldapsearch -b 'dc=as20,dc=itsoroch,dc=ibm,dc=com' 'cn=*' /cn uid
```

```

cn=Julie Brown,dc=as20,dc=itsoroch,dc=ibm,dc=com
uid=JCBROWN
cn=John Brown,dc=as20,dc=itsoroch,dc=ibm,dc=com
uid=JJBROWN
cn=iweAdministrator,dc=as20,dc=itsoroch,dc=ibm,dc=com
cn=iweAdministrators,dc=as20,dc=itsoroch,dc=ibm,dc=com
cn=itdCreateAdministrator,dc=as20,dc=itsoroch,dc=ibm,dc=com
cn=George Weaver,dc=as20,dc=itsoroch,dc=ibm,dc=com
uid=WEAVE
$

```

___ 17. In this example the 'cn=*' means select all common names from the directory. The /cn uid option indicates that only the common name and user ID should be returned.

___ 18. At the Qshell command line press the F9 key to retrieve the last command.

___ 19. Replace the 'cn=*' option with 'cn=user profile' (your particular OS/400 user profile).

___ 20. Remove the /cn option so you can view the entire directory entry. Press the enter key and you should see your entry. Here is an example, based upon the John Brown entry (uid = JJBROWN) displayed earlier:

```

> ldapsearch -b 'dc=as20,dc=itsoroch,dc=ibm,dc=com' 'cn=JJBROWN'
cn=John Brown,dc=as20,dc=itsoroch,dc=ibm,dc=com
objectclass=top
objectclass=person
objectclass=organizationalPerson
objectclass=inetOrgPerson
objectclass=publisher
objectclass=eperson
cn=John Brown
cn=JJBROWN
sn=Brown
uid=JJBROWN
givenname=John
description=John's Directory Entry
title=ITC E-business Team
departmentnumber=NKE
telephonenumber=(507) 555-1212
facsimiletelephonenumber=(507) 555-1212
roomnumber=A114
registeredaddress=Dept. NKE
registeredaddress=IBM Corp.
registeredaddress=3605 Highway 52 North
registeredaddress=Rochester, MN 55901
mail=itcebiz@US.IBM.COM
publishername=dc=RCHASM20,dc=RCHLAND,dc=IBM,dc=COM
displayname=Brown, John

```

___ 21. At the Qshell command line press the F9 key to retrieve the last command.

___ 22. Replace the 'cn=user profile' option with 'uid=user profile' option and rerun the command. You should see the same results.

___ 23. After viewing your team's directory information, keep your Qshell session open because you will be using it later.

___ 24. Your next step will be to go to the WAS Express integrated console (the HTTP Administration application) and ensure the appropriate applications are started.

___ 25. At the Express configuration console, click the **Manage Installed Applications** option under the Applications category.

___ 26. You should see the **IBM Telephone Directory** and **Business Applications** applications listed as enabled, and most likely started.

___ 27. If the applications are not started, start them now. Otherwise, go to the next step.

Depending on the size of the iSeries server used in the class and how many other students are doing the lab, it may take a few seconds for your directory application to start. Eventually you should see the status change to Running.

As mentioned earlier, the IBM Telephone Directory Application works with an LDAP enabled directory. Somehow, the application needs to be told how to interact with the LDAP enabled directory. This is accomplished by the `itdsetup` script shipped with the WAS 5 Express for iSeries product.

___ 28. Return to your interactive session with the active Qshell environment.

___ 29. Change to the appropriate directory via this command:

```
cd /QIBM/ProdData/WebASE/businessApps/IBMTelDir
```

___ 30. Enter command `itdsetup` and press the enter key.

___ 31. You should see help text listing the various options available for associating the IBM Telephone Book application with an appropriate LDAP enabled directory. Briefly review the options available with this command.

___ 32. The `itdsetup` command was already run during the lab setup. PLEASE DO NOT TRY RERUNNING THE COMMAND.

___ 33. Your next step is to view the LDAP environment that the IBM Telephone Directory application is using.

___ 34. At your workstation, map a network drive to the *root* share of the iSeries server being used in class. For example, `\\mySystem\root`

___ 35. Open up a Windows Explorer session and navigate to directory `/QIBM/UserData/WebASE/businessApps/IBMTelDir`.

___ 36. Use a text editor such as Notepad to view file `itd.conf`. It should look similar to this:

```
#####  
# IBM Telephone Directory Configuration file  
#####  
bpBase=dc=as20,dc=itsoroch,dc=ibm,dc=com  
bpLdapHostname=RCHASM20.RCHLAND.IBM.COM;  
bpLdapPort=389;  
bpLdapSecurity=simple;  
bpLdapAdmin=cn=itdCreateAdministrator,dc=as20,dc=itsoroch,dc=ibm,dc=com;  
bpLdapAdminPw=itdadmin;  
bpSearchTimeout=60;  
bpMaxHits=100;  
bpMaxPhotoSize=15360;  
bpBindThreshold=100;  
bpDirType=IBM;  
##### THIS MUST BE THE LAST LINE #####
```

___ 37. Note the `bpBase` parameter containing the LDAP suffix. This specified the directory entries available to the IBM Telephone Directory application.

- ___ 38. Note the bpLdapAdmin=..... and bpLdapAdminPw=..... parameters.
This indicates open enrollment. It allows anyone to create a directory entry. Contrast this to closed enrollment, where only the individual (cn=iweAdministrator) or group (cn=iweAdministrators) administrator can add directory entries. The open enrollment option (-o) was specified when the itdsetup script was initially run.
- ___ 39. Close the text editor window. DO NOT MAKE ANY MODIFICATIONS TO THE ITD.CONF FILE.
- ___ 40. At the Windows Explorer session, notice there is also a file **itd.ldap**. We will discuss its role in the next section.
- ___ 41. Go back to your Express configuration console browser session.
- ___ 42. Click the **Server** drop-down list and select your HTTP server instance (i.e. Apachexx, where xx is your team number).
- ___ 43. At your HTTP server configuration screen click the **Display Configuration File** option under the Tools category.
- ___ 44. Scroll through the configuration file and you should see these directives:

```
LoadModule ibm_ldap_module /QSYS.LIB/QHTTPSVR.LIB/QZSRVLDPAP.SRVPGM

<LocationMatch /itd./*/secure>
    LDAPConfigFile /QIBM/UserData/WebASE/businessApps/IBMTelDir/itd.ldap
    Require valid-user
    PasswdFile %%LDAP%%
    AuthType Basic
    AuthName "IBM Telephone Directory"
</LocationMatch>
<LocationMatch /itd./*/admin>
    LDAPConfigFile /QIBM/UserData/WebASE/businessApps/IBMTelDir/itd.ldap
    LDAPRequire Group iweAdministrators
    Require valid-user
    PasswdFile %%LDAP%%
    AuthType Basic
    AuthName "IBM Telephone Directory - Administrators"
</LocationMatch>
```

- ___ 45. These directives were generated when you created your WAS Express & HTTP Server instance, specifying that the IBM Telephone directory was to be installed.
- ___ 46. These directives enable the HTTP server to challenge the user for an appropriate user ID & password in order to make changes to the directory infrastructure such as adding or modifying an entry.
Now that you have verified the infrastructure, it is time to try out the application.
- ___ 47. At a browser prompt enter the following URL, replacing <system_name> with the name of the system on the lab setup sheet, and wasport with your HTTP server port (i.e. 5xx00):

http://<system_name>:wasport/bizApps
- ___ 48. You should see a Welcome page, with a link to IBM Telephone Directory.
- ___ 49. Click the **IBM Telephone Directory** link and you should be at the search page.

- ___ 50. For your first query, **Search On** should be Name, and **Search For** should be L (since your last name is Lab, see Figure 1-47).
- ___ 51. Click the **Search** button.

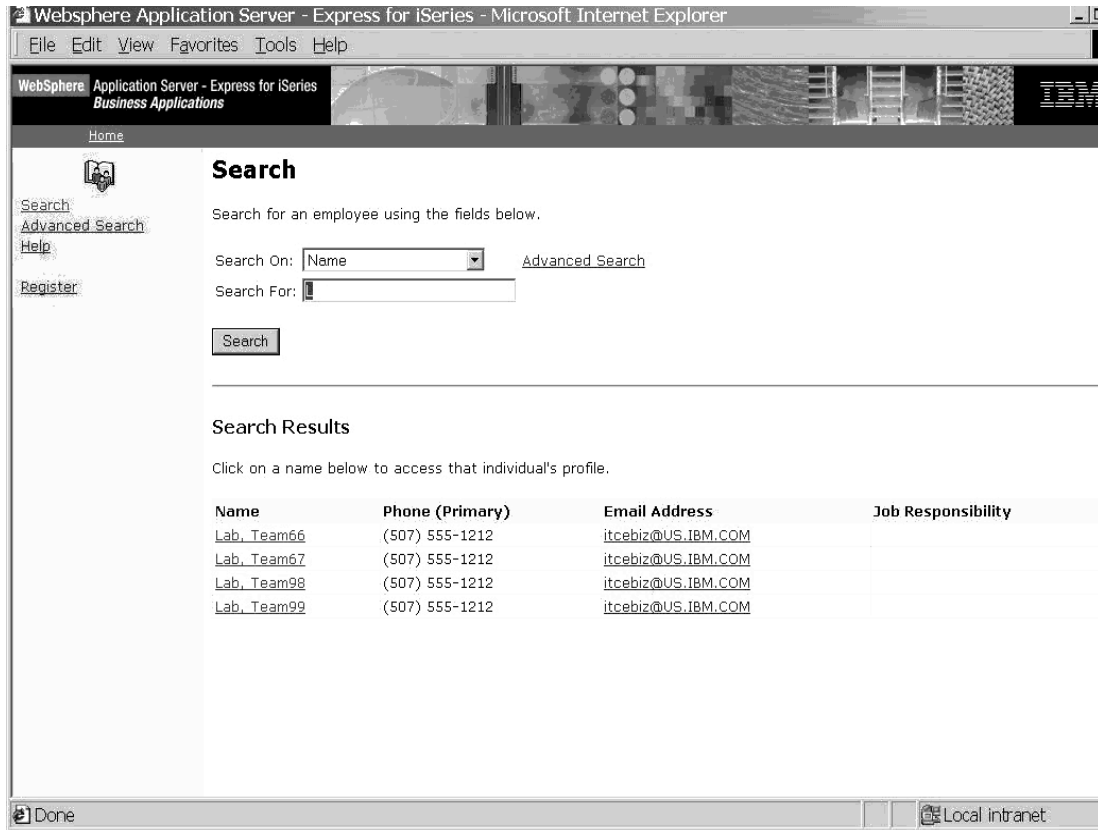


Figure 1-47 Query the sample telephone directory

- ___ 52. Perform another search, this time specifying * in the **Search For** criteria. This should return all entries in the directory.
- ___ 53. Now, click the link for your particular team's entry to view some of the details.
Note that there are options for Update Profile, Change Password & Delete Profile.
- ___ 54. Click the **Update Profile** option. You should see the browser's user ID & password prompt window pop up. Note that the Realm is IBM Telephone Directory. You saw this earlier when viewing your HTTP server configuration file.

Important: You should use the 'cn' (common name), not 'uid' (user ID), value to signon. In case of this lab the 'cn' value is exprXX Lab, where XX is your team number.

- ___ 55. Enter the following values in the input fields (replacing xx with your team number):
 User name: exprXX Lab (xx is your team number, make sure you have a space between exprXX and Lab)
 Password: exprXX (XX is your team number)

- ___ 56. You should now be able to edit your directory entry. Scroll down and find the **Employee Type** drop-down list.
- ___ 57. Specify an Employee Type of Regular. Click the **Submit** button to make the change.
- ___ 58. You should get a confirmation screen, indicating the update was successful.
- ___ 59. Click the back arrow button on your browser to go back and make another edit.
- ___ 60. Scroll to the bottom of the Update Profile screen and locate the option to include a photo.
- ___ 61. Click the **Browse** button and select one of the JPEG type files located in your team IFS directory on the iSeries server used in class (i.e. /exprXX, where xx is your team number).
- ___ 62. Click the **Submit** button to make the change.
- ___ 63. You should get a confirmation screen, indicating the update was successful.
- ___ 64. Click the **Search** link again.
- ___ 65. Repeat your earlier search (Search on: Name & Search For: L).
- ___ 66. Click your team entry and view the results. You should see a photo, similar to that shown in the next diagram:

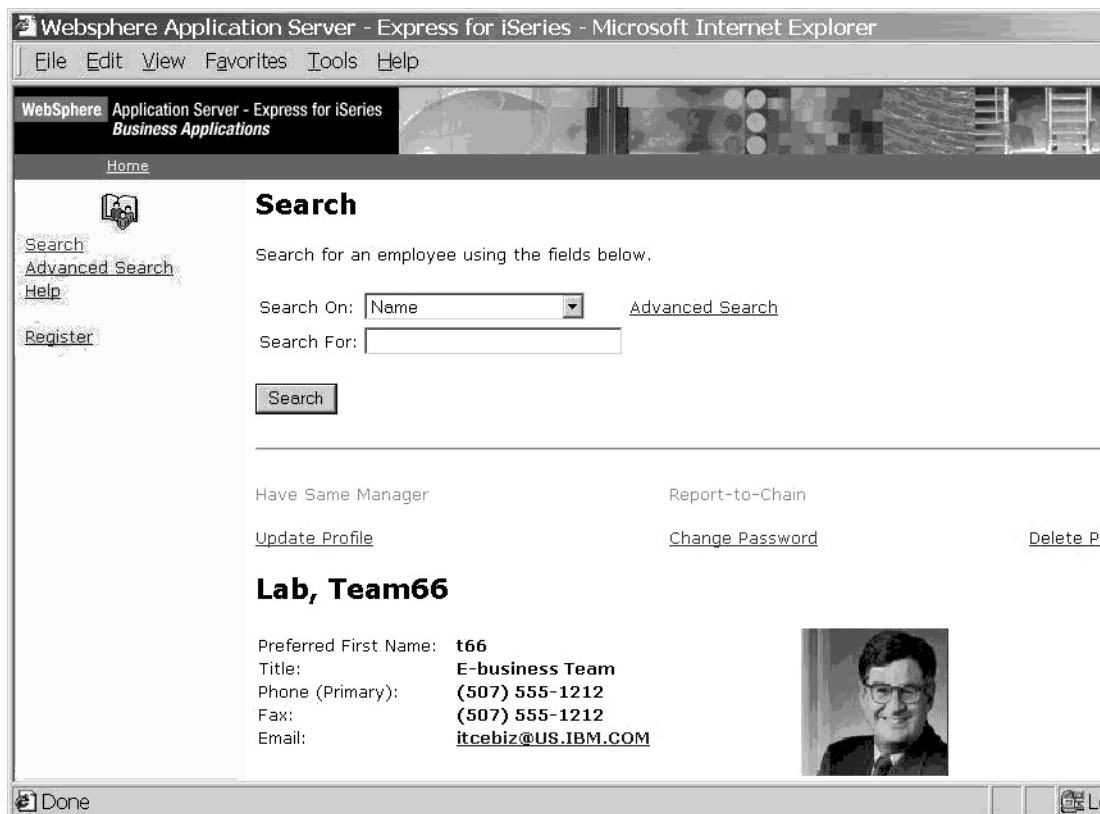


Figure 1-48 View directory entry with a photo

- ___ 67. You were able to modify your team's record because you had the appropriate user ID & password. Now you will try modifying another team's entry, using your team's user ID & password.
- ___ 68. Click the **Search** link again.
- ___ 69. Repeat your earlier search (Search on: Name & Search For: L).
- ___ 70. Click another team's entry and view the results.
- ___ 71. Click the **Update Profile** option. You should not be prompted for a user ID & password.
- ___ 72. Try making a minor update to another team's directory entry and click the **Submit** button.
- ___ 73. You should see an error message, such as this:

Update Results
 Your update was not successful. You may not be authorized to update this profile.
 If you continue to experience problems, please contact the application administrator.
- ___ 74. This is because you have logged on with credentials of 'exprXX Lab' (where xx is your team number). The IBM Telephone Directory application only allows the entry owner, or the administrator to modify the entry.
- ___ 75. Click the **Register** link.
- ___ 76. You should now be able to create a directory entry. The mandatory fields are indicated with a red *.
- ___ 77. After you have created your entry, click the **Submit** button.
- ___ 78. You should get a confirmation screen, indicating the update was successful.

Because open enrollment has been specified for the application, you were not prompted for a user ID and password. If closed enrollment had been specified, you would have been prompted for a user ID and password. Only the administrator(s) would be allowed to create a directory entry.
- ___ 79. Click the **Search** link again.
- ___ 80. Do another search, this time looking at all directory entries (Search on: Name & Search For: *).
- ___ 81. Ensure the directory entry you just added is listed. Go ahead and view the results.
- ___ 82. This concludes the IBM Telephone Directory application portion of the lab. Feel free to explore additional options with this lab, or move on to the next set of exercises.

Task 18: Familiarize yourself with the management scripts

The next set of steps will help you familiarize yourself with the numerous command line utilities available with WAS Express for iSeries. You will find that many of the command line utilities available with the WAS 5 Base or Network Deployment are available in Express.

- ___ 1. If you haven't already done so, map a network drive to the iSeries server being used in class.

- ___ 2. Open up a Windows Explorer session and navigate to the /QIBM/ProdData/WebASE/ASE5/bin directory.
- ___ 3. Note the large selection of different scripts that can be run in the OS/400 Qshell environment. You will be using some of these during this lab exercise.
- ___ 4. Sign on to a 5250 session on the iSeries server being used for this class. At the command line enter STRQSH and press the enter key.
- ___ 5. At the Qshell command line, navigate to the aforementioned IFS directory:


```
cd /QIBM/ProdData/WebASE/ASE5/bin
```
- ___ 6. You will Use the `dspwasinst` script to display information about your WAS Express server instance. At the command line enter the following command to view the script options:


```
dspwasinst -help
```
- ___ 7. Note the options of `-instance` and `-server`. Repeat the `dspwasinst` command, specifying your WAS Express instance name (i.e. WASXX, where XX is your team number). For example:


```
dspwasinst -instance WASxx
```
- ___ 8. You should see information on your instance name & type, and the cell & node names. Note that the cell & node should be of the form `iserieshost_instancename`.
- ___ 9. Scroll down through the data and locate the installed applications for your server instance.
- ___ 10. Scroll down through the data and locate the Ports in **use** section.
- ___ 11. Notice that there are a lot of ports listed, but not currently in use (such as the JMS servers).

This can be advantageous for migrating from WAS 5 Express to WAS 5 Base or Network Deployment edition. The other WAS 5 products require these additional ports. Having them defined already greatly eases the migration process.
- ___ 12. At the Qshell command line, run the `VersionInfo` script (just type in `versionInfo` and press the enter key).
- ___ 13. You should see the WebSphere Application Server version, and the `VersionInfo` reporter version.
- ___ 14. At the Qshell command line, run the `genversionreport` script (just type in `genversionreport` and press the enter key).
- ___ 15. You should see essentially the same results as the `versioninfo` script. The `genversionreport` also writes out an HTML file that has the version of all the WebSphere Application Server components.
- ___ 16. At your Windows Explorer session, look for file **versionReport.html** (it is in the /QIBM/ProdData/WebASE/ASE5/bin directory). Open it up and briefly look at the contents.
- ___ 17. Back at your Qshell session, run the `versioninfo` script (just type in `versioninfo` and press the enter key).

__ 18. You should see a number of directory locations under the installation category.

__ 19. Scroll down to the **Technology List** section. Answer the following questions:

What products are installed?

What are the versions of the products?

What are the build levels of the products?

__ 20. You will now use the `serverstatus` script to display information about your WAS Express server instance. At the command line enter the following command to view the script options:

```
serverstatus -instance WASXX -all
```

replace XX with your team number.

__ 21. WAS Express only allows one application server per instance. You should see one server and its status.

What is the name of the server?

__ 22. Your server name and instance name will be the same because you used the integrated console to create them.

As an alternative, one can use the `crtwasinst` script to create a server instance. With the `crtwasinst` script, there is an option to change the server name to something other than the instance name. Doing this, however, prevents you from using the integrated console to manage and configure your instance.

__ 23. In the next step you will look at your WAS Express `activity.log` file in two views a difficult to read view and an easy to read view. You will use the `showlog` script to create the easy to read view.

__ 24. At your Windows Explorer session navigate to directory
`/qibm/userdata/Webbase/ase5/wasxx/logs` (where xx is your team number).

__ 25. Open the **activity.log** file with a text editor such as Wordpad or Textpad.

__ 26. Note that it contains information similar to what you saw in Task 12:, "View the log files within the integrated console" on page 25. Also note that there are control type characters.

__ 27. Leave the text editor session open, for now.

__ 28. WebSphere includes a log analyzer application that runs on a workstation and can be used to get a better view of this log file.

For this lab, you will run the `showlog` script to appropriately format the log file, similar to what the WebSphere log analyzer would do.

- ___ 29. At your Qshell session enter the following command on one line to format the activity.log file and write the results to another file:
- ```
showlog /qibm/userdata/Webase/ase5/wasxx/logs/activity.log
/qibm/userdata/Webase/ase5/wasxx/logs/activity_f.log
```
- replace XX with your team number
- \_\_\_ 30. The first parameter is the location of the log file, the second parameter is the output location. You can also run the showlog script with just the first parameter. The output will be sent directly to the console.
- \_\_\_ 31. Now, go back to your text editor session that has the original activity.log file displayed. Open up the activity\_f.log file you saved in the previous step.
- \_\_\_ 32. Note that the results are much easier to read.
- You can also start and stop your WAS Express instance from scripts. These are what the integrated console use to start and stop the instance.
- \_\_\_ 33. At your Qshell session enter command: stopserver -help
- \_\_\_ 34. You should see the format is:
- ```
stopserver -instance instancename applicationservername
```
- ___ 35. If you have time, you can stop your WAS Express instance by issuing command:
- ```
stopserver -instance WASXX WASXX
```
- replace xx with your team number
- \_\_\_ 36. At your Qshell session enter command: startserver -help
- \_\_\_ 37. You should see the format is:
- ```
startserver -instance instancename applicationservername
```
- ___ 38. If you stopped your server in the previous step, you can start it by issuing command:
- ```
startserver -instance WASXX WASXX
```
- replace xx with your team number

Your next, and last, step is to familiarize yourself with WAS Express tracing capabilities.

## Task 19: Familiarize yourself with the WAS Express Trace facility

For this exercise you will use the stdxx\_5 database application you installed and tested earlier.

- \_\_\_ 1. At a browser prompt enter the following URL, replacing <system\_name> with the name of the system on the lab setup sheet, and wasport with your HTTP server port (i.e. 5xx00). Note: leave the xx in the stdxx\_5 component of the URI.
- ```
http://<system_name>:wasport/stdxx_5/ItemSearchInputForm.html
```
- ___ 2. Click the **Submit** link to look up the available products.
- ___ 3. Click the link for any of the returned items.

- ___ 4. After verifying that your application is running properly, the next step is to go directly back to the Web page. For this server tracing exercise, it is important that you start the application from the HTML page, rather than being in the output pages and clicking the back links on the application or browser.
- ___ 5. At a browser prompt enter the following URL, replacing <system_name> with the name of the system on the lab setup sheet, wasport with your HTTP server port (i.e. 5xx00). Note: leave the xx in the stdxx_5 component of the URI:

```
http://<system_name>:wasport/stdxx_5/ItemSearchInputForm.html
```
- ___ 6. Leave this browser session open. Again, verify that the Web page address is ItemSearchInputForm.html and not ItemSearchController.
- ___ 7. Your next step is to configure the trace parameters.
- ___ 8. Open up a full function Administrative Console browser session.
- ___ 9. Click the **Troubleshooting** link under the application server instance name.
- ___ 10. Click the **Logs and Trace** option and you should see your server instance listed in the Logging and Tracing panel.
- ___ 11. Click the your team's server link (WASxx) and you should be at the **Logging and Tracing** options panel.
- ___ 12. Click the **Diagnostic trace** link.
- ___ 13. Select the **Runtime** tab.
- ___ 14. Click the **Modify** button.
- ___ 15. Select the **Components** tab.
- ___ 16. Click the **com.ibm.ws.*** link.
- ___ 17. Another window should popup, allowing you to select the trace level. Click the **all enabled** link (see Figure 1-49).

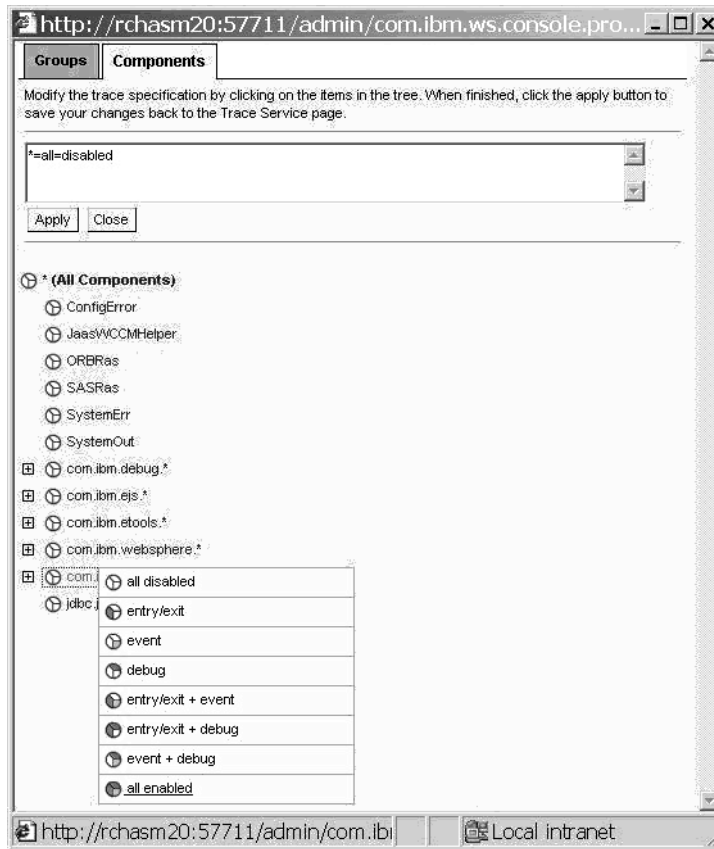


Figure 1-49 Define the tracing criteria

- ___ 18. Your next step is to add JDBC tracing.
- ___ 19. In the trace specification text field, manually append `jdbc.*=all=enabled` to the trace specification (it should now read **`com.ibm.ws.*=all=enabled;jdbc.*=all=enabled`**).
- ___ 20. Observe the trace definition in the text box field as shown in Figure 1-50.

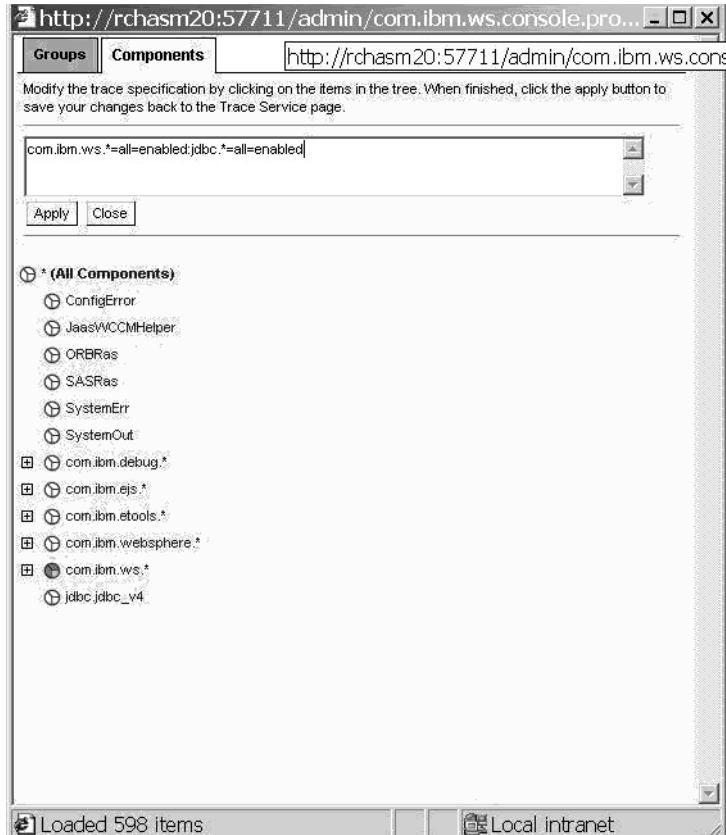


Figure 1-50 Add tracing criteria

- ___ 21. Click the **Apply**, then **Close** buttons on the popup window.
- ___ 22. Back at the Administrative Console window, observe that the trace parameters are listed in the Trace Specification.
- ___ 23. In the Trace Output, click the **Memory Buffer** radio button option. This stores trace data in memory, rather than immediately writing it to disk.
- ___ 24. Set the **Maximum Buffer Size** to 20 thousand entries.
- ___ 25. Set **Dump File Name** to /exprXX/trace.log (where xx is your team number; see Figure 1-51).

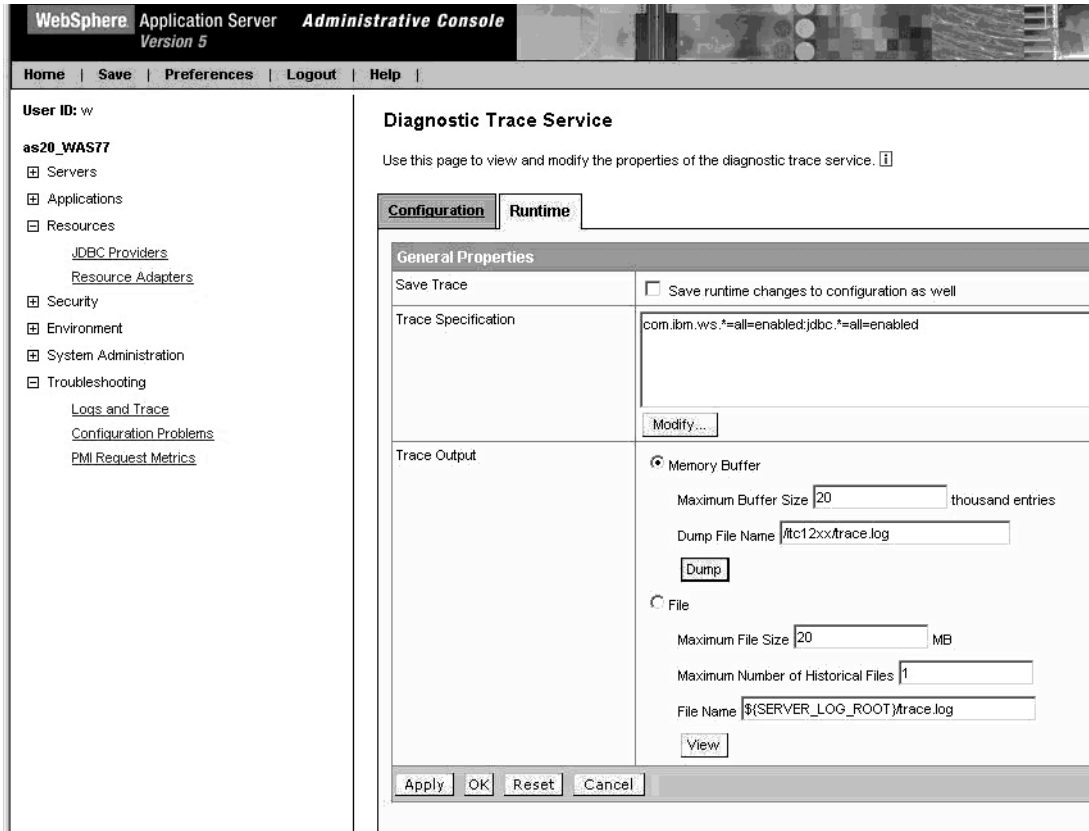


Figure 1-51 View the runtime trace definition

- ___ 26. Click the **Apply** button. Keep the Administrative Console Diagnostic Trace Service Runtime panel open for later use.
- ___ 27. Your next step is to trace the database query application you tested earlier in this section.
- ___ 28. Go to your browser session that has the `http://<system_name>:wasport/stdxx/ItemSearchInputForm.html` page visible.
- ___ 29. Enter another query criteria, such as low value of 000002 and high value of 000009. Click the **Submit** link.
- ___ 30. At the returned items page, pause a second or two, then click the **Details** link of any of the items.
- ___ 31. Go back to your browser session for the Administrative Console Diagnostic Trace Service Runtime session (refer to Figure 1-51).
- ___ 32. Navigate to the **Trace Output** section and click the **Dump** button. This will write the trace contents to a file on the iSeries server being used in class.
- ___ 33. The trace file will be fairly large, probably close to 1.5 MB.
- ___ 34. If you haven't already done so, map a network drive to the iSeries server being used in class.
- ___ 35. Use a text editor such as Wordpad or Textpad to view the log file you saved (`/exprXX/trace.log`, where xx is your team number).

- ___ 36. The trace file will contain details on the database query application you tested, as well as the Administrative Console application (and any other Web applications run during the trace collection).

To find the pertinent trace data for this lab, we have provided some hints to help you quickly locate the relevant information.

- ___ 37. In your text editor session, search for the first occurrence of **stdxx_5**. The WebSphere trace facility records the URL and this will help you locate the beginning of the transaction.

- ___ 38. Scroll upwards approximately 20 lines and you should see a transaction boundary. Here is an example:

```
[1/24/03 22:38:05:859 UTC] 46a50f2d ResponseStrea < writeHeaders
                           closed
[1/24/03 22:38:05:859 UTC] 46a50f2d HttpConnectio < readAndHandleRequest
[1/24/03 22:38:05:859 UTC] 46a50f2d HttpConnectio < run
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpConnectio > run <--- method entry event
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpConnectio > readAndHandleRequest
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpRequest > readRequest
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpRequest > readRequestLine
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpRequest > readUri
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpRequest < readUri
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpRequest > readVersion
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpRequest < readVersion
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpRequest < readRequestLine
[1/24/03 22:38:15:356 UTC] 46a50f2d HttpRequest > readHeaders
[1/24/03 22:38:15:357 UTC] 46a50f2d HttpRequest > addHeader
                           accept
                           image/gif, image/x-xbitmap, image/jpeg, image/pjpeg,
application/msword, */*
[1/24/03 22:38:15:357 UTC] 46a50f2d HttpRequest > addHeader
                           accept
                           image/gif, image/x-xbitmap, image/jpeg, image/pjpeg,
application/msword, */*
[1/24/03 22:38:15:357 UTC] 46a50f2d HttpRequest < addHeader
[1/24/03 22:38:15:357 UTC] 46a50f2d HttpRequest > addHeader
                           referer
                           http://rchasm20:57700/stdxx_5/ItemSearchInputForm.html
```

- ___ 39. From this trace excerpt one can already ascertain what MIME types the requesting browser accepts, plus the entire URL of the Web page used to launch the application.

- ___ 40. Record the timestamp for the start of the transaction, as it will help you locate the relevant data throughout this lab.

- ___ 41. Scroll through the trace data and locate the end of the first database query operation. Here is an example:

```
[1/24/03 22:38:15:441 UTC] 46a50f2d HttpConnectio < readAndHandleRequest
[1/24/03 22:38:15:441 UTC] 46a50f2d HttpConnectio < run <-----method exit event
[1/24/03 22:38:15:464 UTC] 46a50f2d HttpConnectio > run
[1/24/03 22:38:15:464 UTC] 46a50f2d HttpConnectio > readAndHandleRequest
```

- ___ 42. From this trace excerpt one can estimate the Web application time being 85 milliseconds (22:38:15:441-22:38:15:356).

- ___ 43. Record the timestamp for the end of the transaction, as it will help you locate the relevant data throughout this lab.

___ 44. Now that you have established the transaction time boundaries, use the trace data to answer the following questions.

There are examples on the next page, if you have difficulty locating the appropriate information in the trace file.

What Web browser accessed the application?

(hint: search for user-agent)

What is the URI of the servlet that is invoked?

(hint: search for dispatchByURI)

What is the name of the servlet used for output?

(hint: search for WebAppRequestDispatcherInfo)

What serializable session information is available?

(hint: search for non-serializable)

What user profile was used for the db query?

(hint: search for UserName)

Is the password shown in trace file?

What SQL command is used for the db query?

(hint: search for preparedStatement)

How many data bytes were written out to the browser?

(hint: search for BufferedWrite > write)

What are the output data attributes? character set

Content-Language

(hint: search for Commit header)

What is the overall transaction time?

(hint: refer to the earlier example showing 85 ms)

- What Web browser accessed the application? Mozilla/4.0 (compatible; MSIE 5.5; Windows NT 5.0; T312461)
- What is the URI of the servlet that is invoked? /stdxx_5/ItemSearchController
- What is the name of the servlet used for output? ItemSearchMasterView
- What serializable session information is available? {low=000002, high=000009} (the search criteria)
- What user profile was used for the db query? UserName = itc1298
- Is the password shown in trace file? no
- What SQL command is used for the db query?
SELECT WSSLIB.ITEM.IID, WSSLIB.ITEM.INAME, WSSLIB.ITEM.IPRICE,
WSSLIB.ITEM.IDATA FROM WSSLIB.ITEM WHERE WSSLIB.ITEM.IID >= ? AND
WSSLIB.ITEM.IID <= ?
- How many data bytes were written out to the browser? 4560 for low=000002,
high=000009 (your results may vary)
- What are the output data attributes? charset=ISO-8859-1
Content-Language:en-US

___ 45. If you have time, feel free to peruse other information in the trace file. You may find it useful to search through the database interaction entries. The trace file shows details on getting a database connection, preparing & executing an SQL statement, getting the result set, and closing the session.

___ 46. You could also peruse the second transaction, where you clicked on the details link for a particular item. This transaction, however, does not involve a separate query (it uses results from the first transaction).

This concludes the lab exercises.

