Creating an Instance of WebSphere Application Server – Express for iSeries

3/1/03

The objective of this lab is to create a new instance of WebSphere Application Server - Express for iSeries (alias WAS Express).

The results of this lab will be built upon in the next student exercise associated with this course, as well as be reused in the WebFacing Tool Distance Learning Course.

The creation of a new instance of a WebSphere Application Server is a basic administration task, and one that should be able to be performed by both developers and web masters alike. It is expected that multiple application servers will typically be created on a single iSeries system, for use in development, test and production environments.

This Lab has the following steps:

1. ***Open a 5250 Emulation Session***
2. ***Ensure that the UserID being used for the lab has the required OS/400 authorities***
3. ***Ensure that the WebSphere Application Server – Express for iSeries subsystem is operational***
4. ***Ensure that the HTTP Server Administration TCP/IP Service is operational***
5. ***Use the iSeries Integrated Browser Interface to create a new instance of WAS Express and a related external HTTP Server Powered by Apache***
6. ***Explore the set of WAS Express services that are available via the Integrated Browser Interface***
7. ***Enable and start the full function WebSphere Application Server Administrative Console***
8. ***Configure the new WAS Express instance to enable multiple language encodings (This is required for successful use of the WebFacing Runtime).***
9. ***Regenerate the HTTP server plugin from the full function administrative console***
10. ***View the iSeries Job Information (Optional Step)***
11. ***View the WebSphere Application Server Log Information (Optional Step)***

Note that the instance names and port numbers used in this lab are only examples.

Please check with your local iSeries System and e-Business Application Administrators to ensure that you do not attempt to duplicate resources already in use.

   - HTTP Server Powered by Apache– Instance name WEBSERVER, Port # 59900
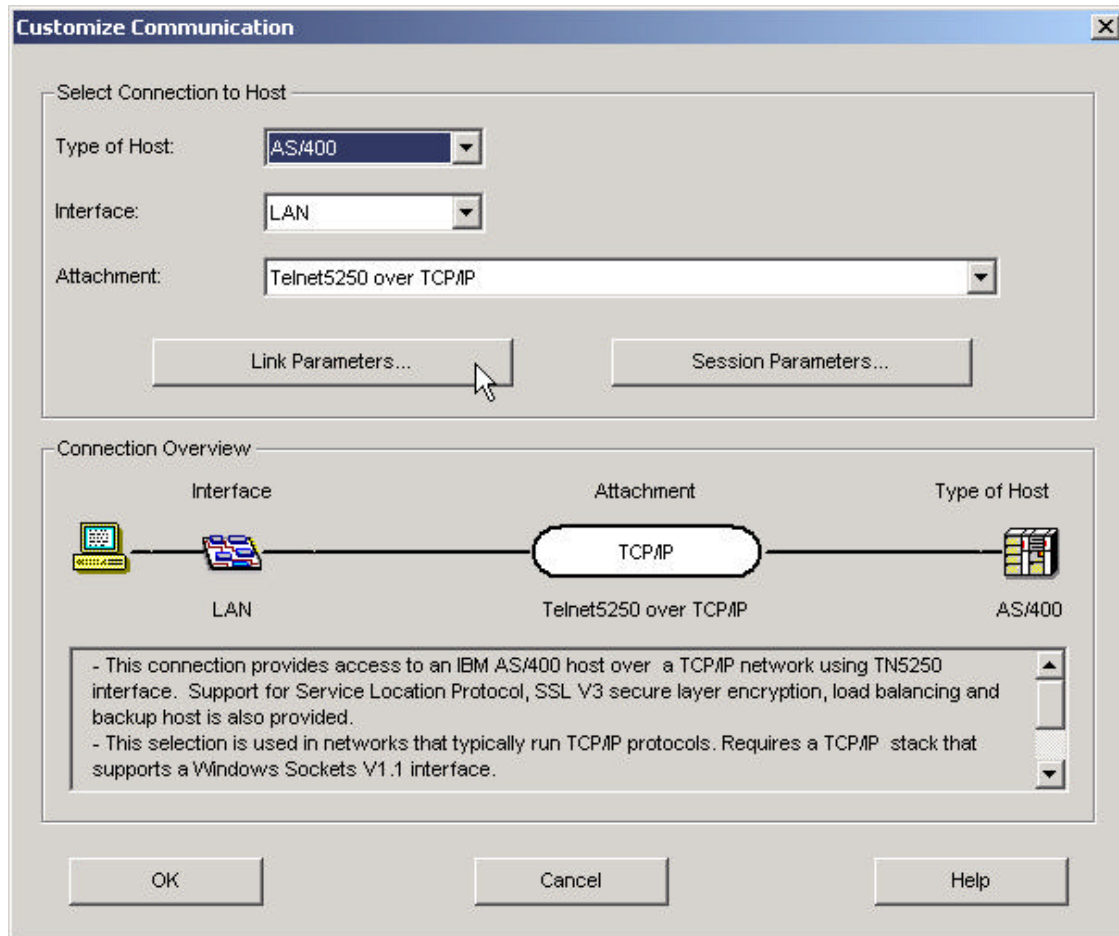   - WebSphere Express – Instance name WASEXP, Ports #59901-59912

1. Open a 5250 Emulation Session

___ 1. If you already have a **Personal Communication Session icon** created on your workstation desktop for your target iSeries system, then **double click** on it and **go to step 2.**

   ## Or

   - Press the **Start** button on the task bar

   - Choose *Start→ Programs→ IBM Personal Communications→ Start or Configure a session*.

      - Click on **Configure**

         - *On the customize Communication dialog*

            - Choose **AS/400** as *Type of Host*

- Press the **Link Parameters...** push button

- Type your **iSeries host name** or **IP address** into the **Primary** entry field

- Press the **OK** push button on the **TelNet5250** dialog

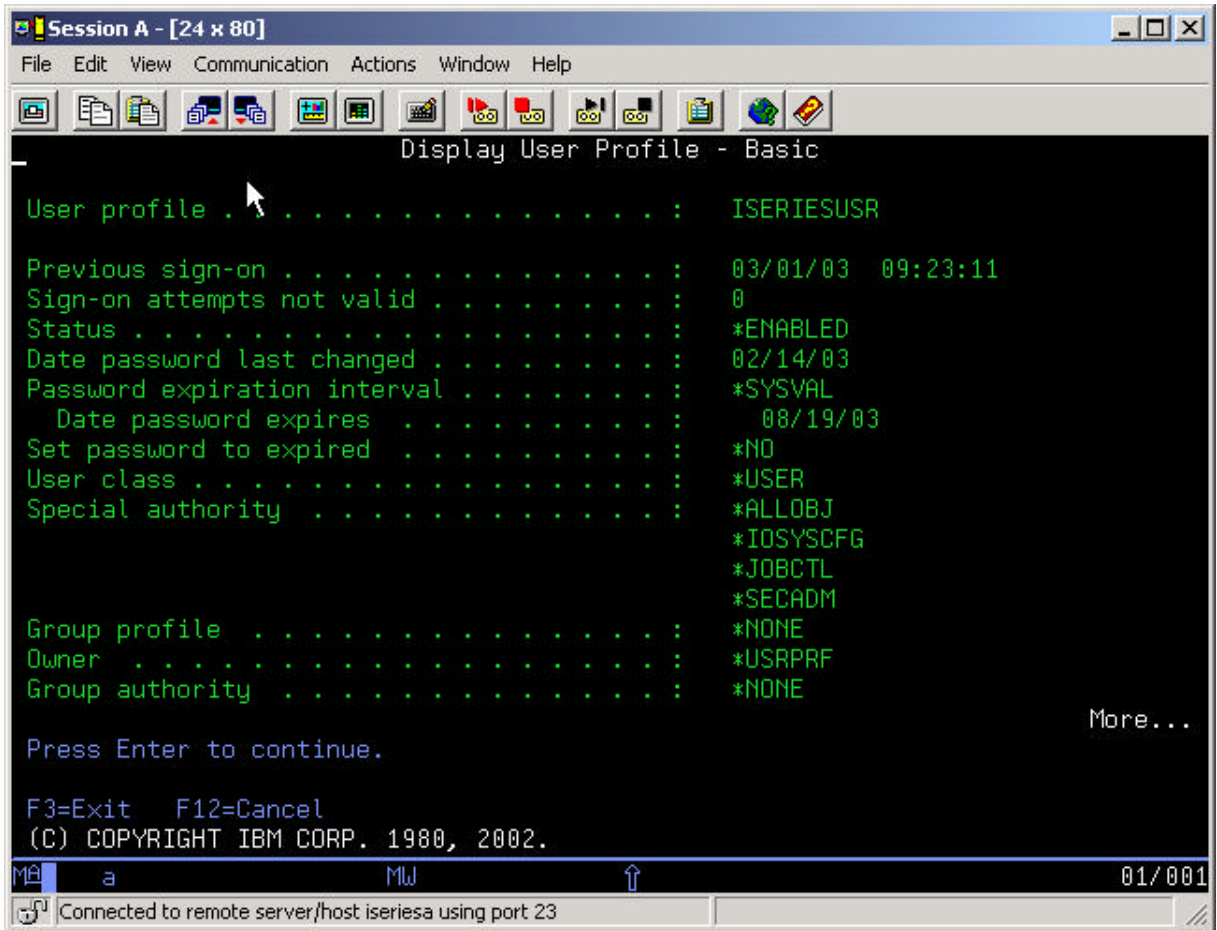- Press the **OK** push button on the **Customize Communication** dialog

__ 2. You should see an iSeries 5250 emulation window with the sign on screen appear on your desktop.

   Sign on using your **iSeries User ID** and **password**.

Creating an Instance of WebSphere Application Server – Express for iSeries

2. Ensure that the UserID being used for the lab has the required OS/400 authorities

__ 1. Use the **DSPUSRPRF** command to verify that the **UserID being used to complete the lab has *IOSYSCFG, *ALLOBJ, *JOBCTL and *SECADM Special Authorities.**

```
Session A - [24 x 80]
File  Edit  View  Communication  Actions  Window  Help

                    Display User Profile - Basic

User profile . . . . . . . . . . . . . . . :   ISERIESUSR

Previous sign-on . . . . . . . . . . . . . :   03/01/03  09:23:11
Sign-on attempts not valid . . . . . . . . :   0
Status . . . . . . . . . . . . . . . . . . :   *ENABLED
Date password last changed . . . . . . . . :   02/14/03
Password expiration interval . . . . . . . :   *SYSVAL
  Date password expires  . . . . . . . . . :    08/19/03
Set password to expired  . . . . . . . . . :   *NO
User class . . . . . . . . . . . . . . . . :   *USER
Special authority  . . . . . . . . . . . . :   *ALLOBJ
                                               *IOSYSCFG
                                               *JOBCTL
                                               *SECADM
Group profile  . . . . . . . . . . . . . . :   *NONE
Owner  . . . . . . . . . . . . . . . . . . :   *USRPRF
Group authority  . . . . . . . . . . . . . :   *NONE
                                                              More...
Press Enter to continue.

F3=Exit   F12=Cancel
(C) COPYRIGHT IBM CORP. 1980, 2002.
MA    a              MW              ⇧                        01/001
Connected to remote server/host iseriesa using port 23
```
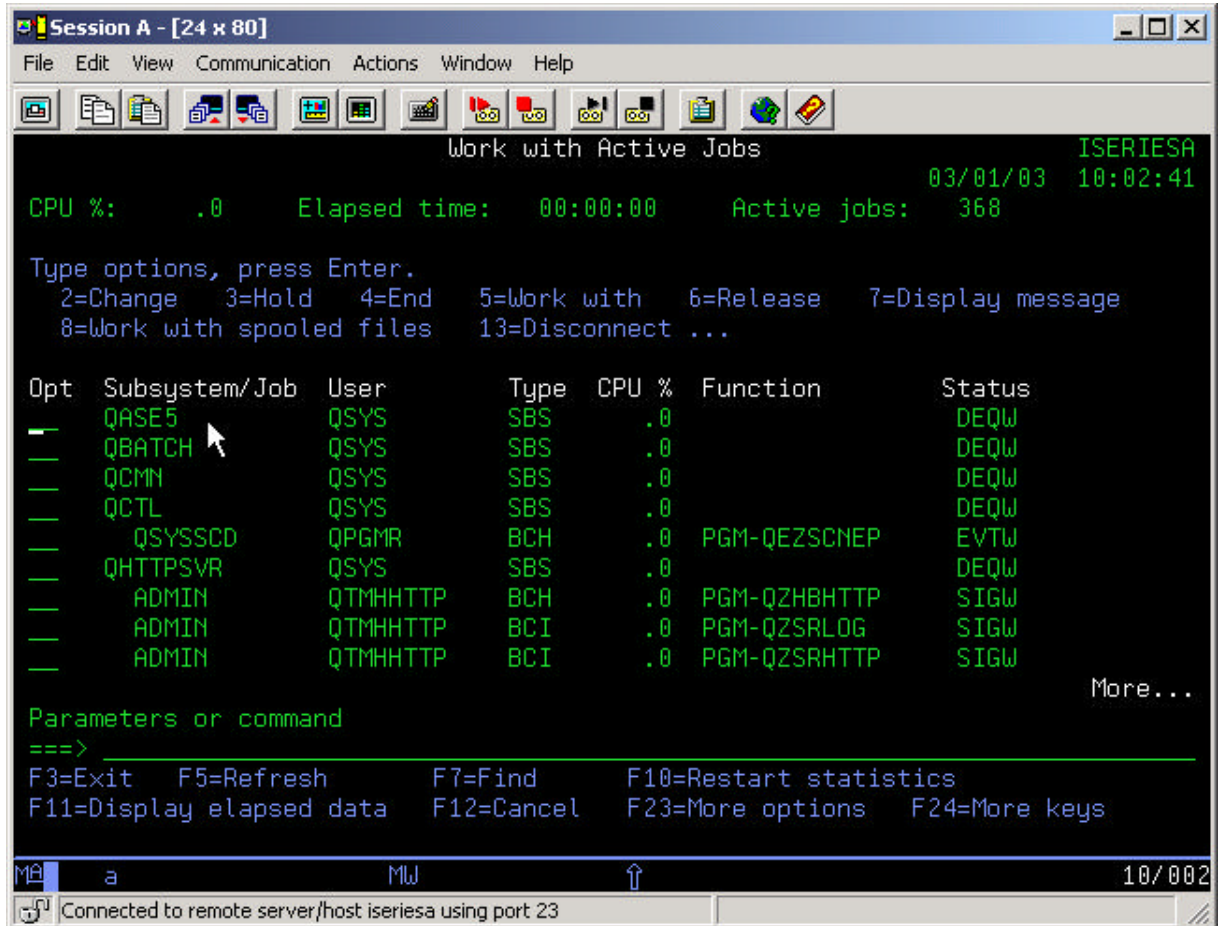
__ 2. **If any of the authorities are missing, use the CHGUSRPRF command to add them (or have someone with the required authority add them for you).**

__ 3. **If you have had to add any authorities to your user profile, you will need to signoff and sign back on under a new interactive (emulation) session.**

These authorities are required in order to be able to create new instances of WebSphere Application Server – Express for iSeries, as well as new instances of HTTP Server Powered by Apache. *JOBCTL Special Authority is required to be able to access and view job attributes.

3. Ensure that the WebSphere Application Server – Express for iSeries subsystem is operational

__ 1.   Enter **WRKACTJOB** on the iSeries Command Line

```
Session A - [24 x 80]                                                    _ □ ×
File  Edit  View  Communication  Actions  Window  Help
□  📋📋  🖥️🖥️  🖥️🖥️  ⌨️  📕📕  📕📕  📁  🌐🏷️
                       Work with Active Jobs                          ISERIESA
                                                        03/01/03   10:02:41
 CPU %:       .0      Elapsed time:    00:00:00      Active jobs:     368

 Type options, press Enter.
   2=Change    3=Hold    4=End    5=Work with   6=Release   7=Display message
   8=Work with spooled files    13=Disconnect ...

 Opt  Subsystem/Job  User        Type  CPU %  Function      Status
  __    QASE5         QSYS        SBS    .0                   DEQW
  __    QBATCH        QSYS        SBS    .0                   DEQW
  __    QCMN          QSYS        SBS    .0                   DEQW
  __    QCTL          QSYS        SBS    .0                   DEQW
  __      QSYSSCD     QPGMR       BCH    .0   PGM-QEZSCNEP    EVTW
  __    QHTTPSVR      QSYS        SBS    .0                   DEQW
  __      ADMIN       QTMHHTTP    BCH    .0   PGM-QZHBHTTP    SIGW
  __      ADMIN       QTMHHTTP    BCI    .0   PGM-QZSRLOG     SIGW
  __      ADMIN       QTMHHTTP    BCI    .0   PGM-QZSRHTTP    SIGW
                                                              More...
 Parameters or command
 ===>
 F3=Exit   F5=Refresh      F7=Find      F10=Restart statistics
 F11=Display elapsed data  F12=Cancel   F23=More options   F24=More keys

MA    a                 MW              ⇧                        10/002
🖳 Connected to remote server/host iseriesa using port 23
```

__ 2.   **Look for a subsystem entry of QASE5**. If the subsystem entry is**found, please skip** to the next section.

__ 3.   If the **QASE5 subsystem is not active**, start it by issuing the following command **STRSBS SBSD(QASE5/QASE5). Re-enter** the**WRKACTJOB** command, and **wait** until the WebSphere Application Server – Express for iSeries subsystem, **QASE5, is in DEQW** status.

4. Ensure that the HTTP Server Administration TCP/IP Service is operational.

__ 1. Once again, enter **WRKACTJOB** on the iSeries Command Line

```
Session A - [24 x 80]                                              _ | □ | X |
File  Edit  View  Communication  Actions  Window  Help

□   ⌨⌨   ⌨⌨   ⌨⌨   ⌨⌨   ⌨   ⌨⌨   ⌨⌨   ⌨   ⌨   ⌨
                        Work with Active Jobs                         ISERIESA
                                                          03/01/03  10:02:41
 CPU %:      .0      Elapsed time:    00:00:00     Active jobs:    368

 Type options, press Enter.
   2=Change    3=Hold    4=End    5=Work with    6=Release    7=Display message
   8=Work with spooled files    13=Disconnect ...

 Opt  Subsystem/Job  User      Type  CPU %  Function       Status
  __   QASE5          QSYS      SBS    .0                   DEQW
  __   QBATCH         QSYS      SBS    .0                   DEQW
  __   QCMN           QSYS      SBS    .0                   DEQW
  __   QCTL           QSYS      SBS    .0                   DEQW
  __     QSYSSCD      QPGMR     BCH    .0   PGM-QEZSCNEP    EVTW
  __   QHTTPSVR       QSYS      SBS    .0                   DEQW
  __     ADMIN        QTMHHTTP  BCH    .0   PGM-QZHBHTTP    SIGW
  __     ADMIN        QTMHHTTP  BCI    .0   PGM-QZSRLOG     SIGW
  __     ADMIN        QTMHHTTP  BCI    .0   PGM-QZSRHTTP    SIGW
                                                              More...
 Parameters or command
 ===> _____
 F3=Exit    F5=Refresh        F7=Find        F10=Restart statistics
 F11=Display elapsed data    F12=Cancel    F23=More options   F24=More keys

 MA    a              MW              ⇧                        10/002
 Connected to remote server/host iseriesa using port 23
```

__ 2. Scroll down the Subsystem/Job column, and **look for a subsystem entry of QHTTPSVR**. If the subsystem entry is **found, and there are 3 jobs running with a name of ADMIN, please skip** to the next section.

__ 3. If the QHTTPSVR subsystem and the ADMIN jobs were not running, start the administrative service by entering the following command **STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)**. Entering this command will start both the QHTTPSVR subsystem as well as the HTTP Server Administration service. Re-enter the **WRKACTJOB** command, and **wait** until the **QHTTPSVR subsystem and series of 3 ADMIN jobs are active**, then proceed to the next step.

5. Use the iSeries Integrated Browser Interface to create a new instance of WAS Express and a related external HTTP Server Powered by Apache

The Integrated Browser Interface will be used to create both an instance of WebSphere Express as well as an

Associated instance of HTTP Server Powered by Apache.

__ 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). When prompted, enter your iSeries UserID and Password .

__ 2. You should be at the iSeries Tasks web page, as shown in the next diagram.

__ 3. **Click** on the **IBM WebSphere Application Server – Express for iSeries link.**

Creating an Instance of WebSphere Application Server – Express for iSeries

__ 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 on the link a few times to familiarize yourself with how to expose and hide the various 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 page, with sections entitled Virtual Hosts, Install Application, and Data Sources and JDBC Providers. **Click** the **Next** button to advance to the first real interaction for the wizard.

___ 8.   This screen lets you specify the name for your new application server.

Enter an **Application Server name** of **WASEXP**
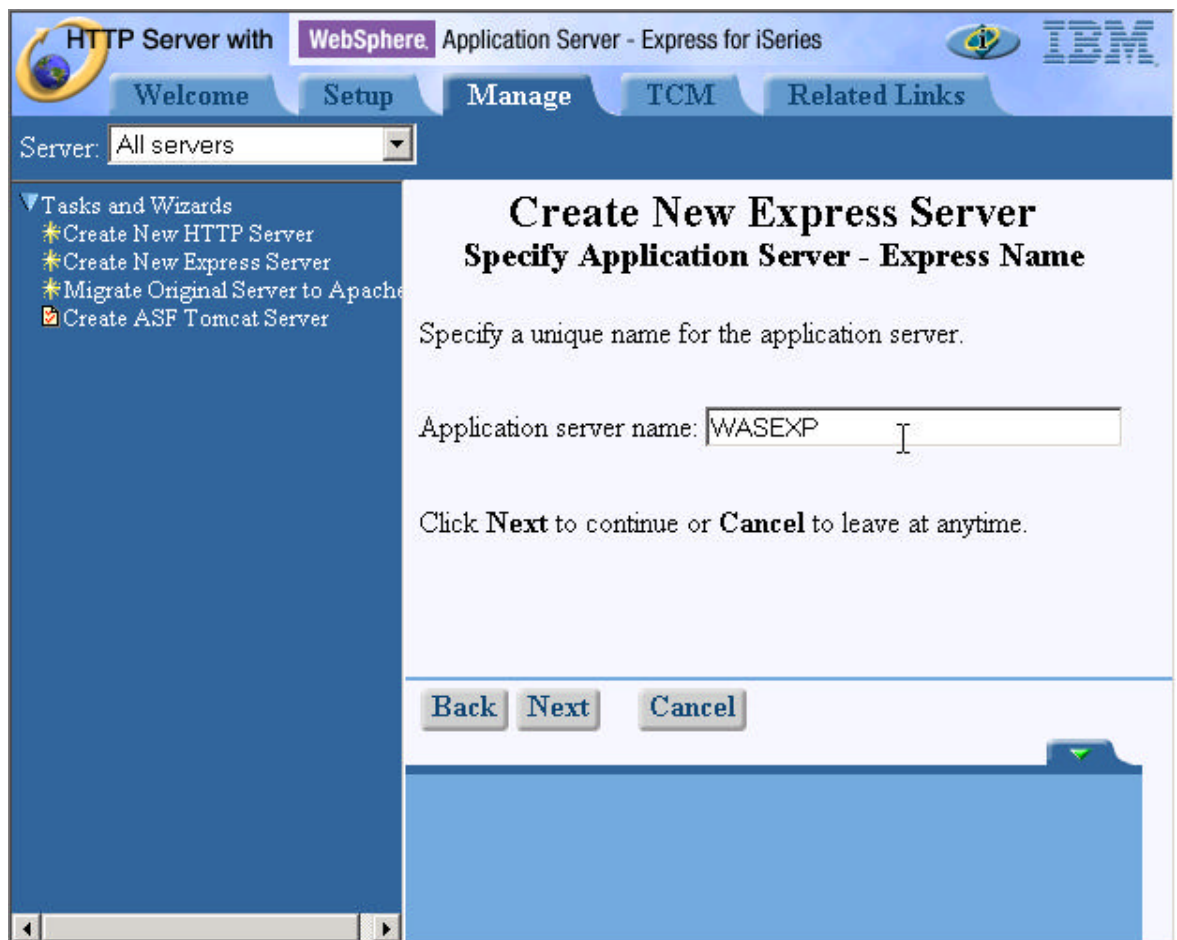
Click the **Next** button.

__ 9. The next action is to indicate whether you would like to use an existing, or create a new external HTTP server, to be used in conjuction with your new WebSphere Express application server instance.

Choose the **Create a new HT TP server (powered by Apache) option** and**click** the **Next** button.
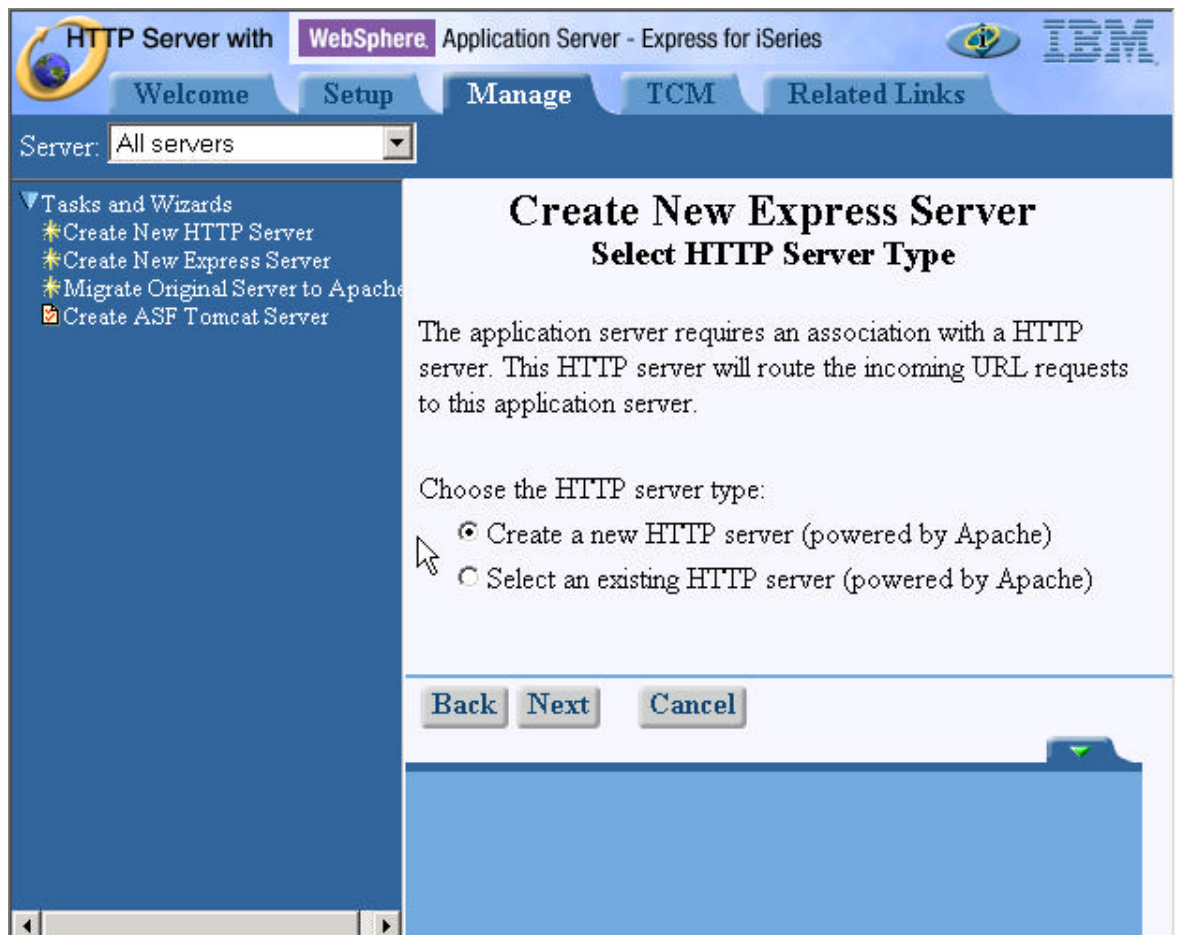
__ 10. Since we indicated that a new HTTP server was to be created, the server name and its associated port settings must be specified.

Enter **WEBSERVER** (which should be the default) as the **HTTP Server name.**

Ensure that **All IP addresses** is selected as the **IP address** parameter.

Enter **59900** as the **Port Number**.
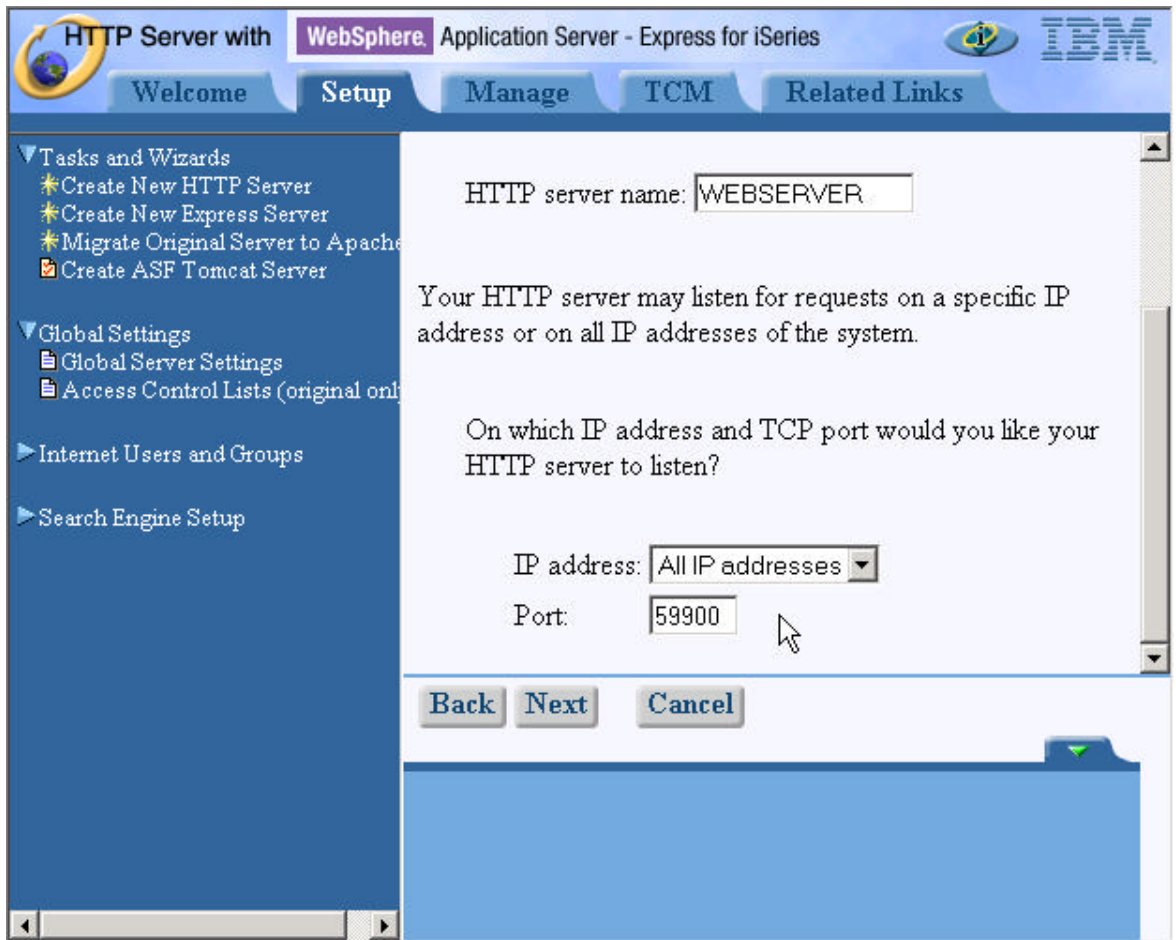
Click the **Next** button.

___ 11. The next step in the wizard is to define which TCP/IP ports should be used by your new WAS Express instance. Note that WAS Express requires 12 consecutive unused ports.
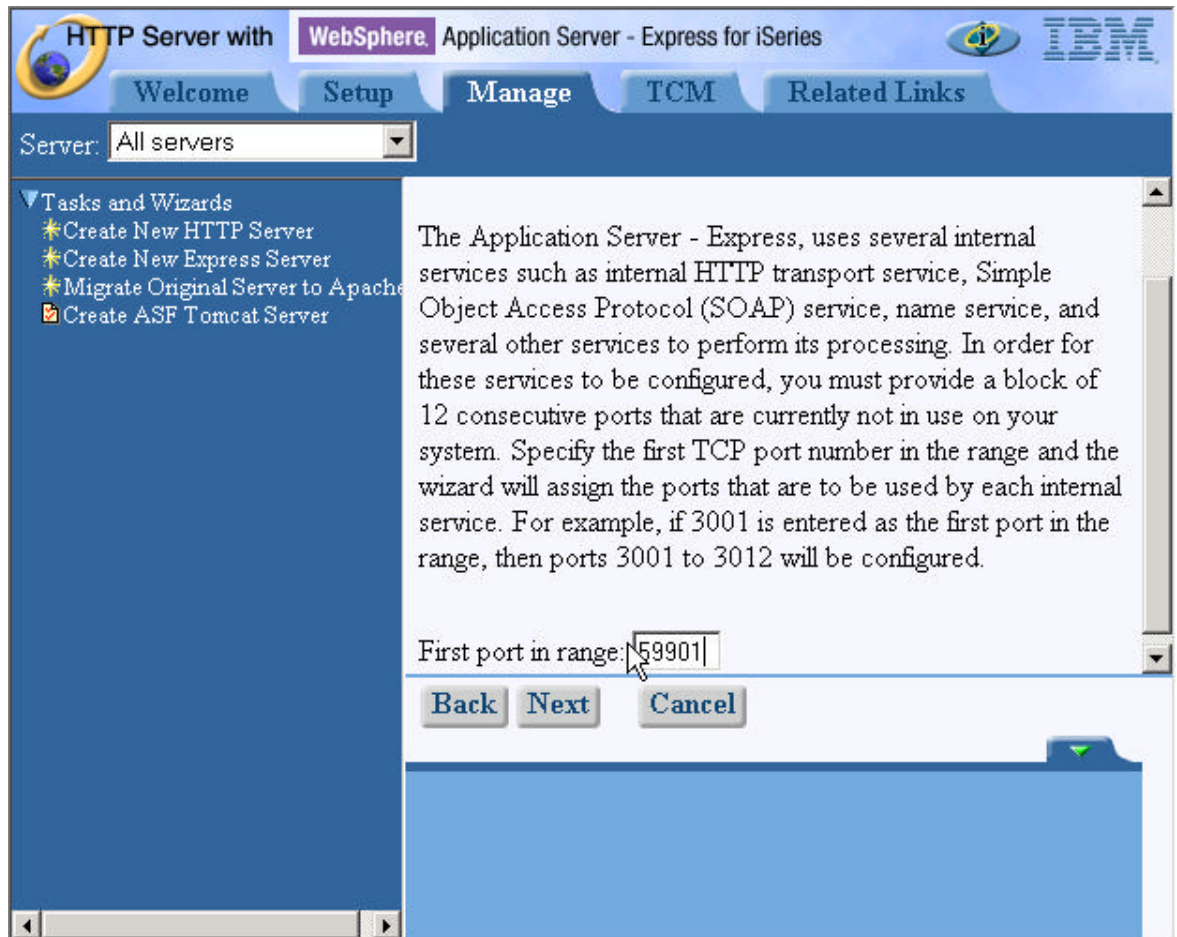
Enter a **starting port number** of **59901**

Click the **Next** button

___ 12. The next screen lets you specify which business and sample applications you want to install. For this lab, just **select** the **ExpressSamples** application.
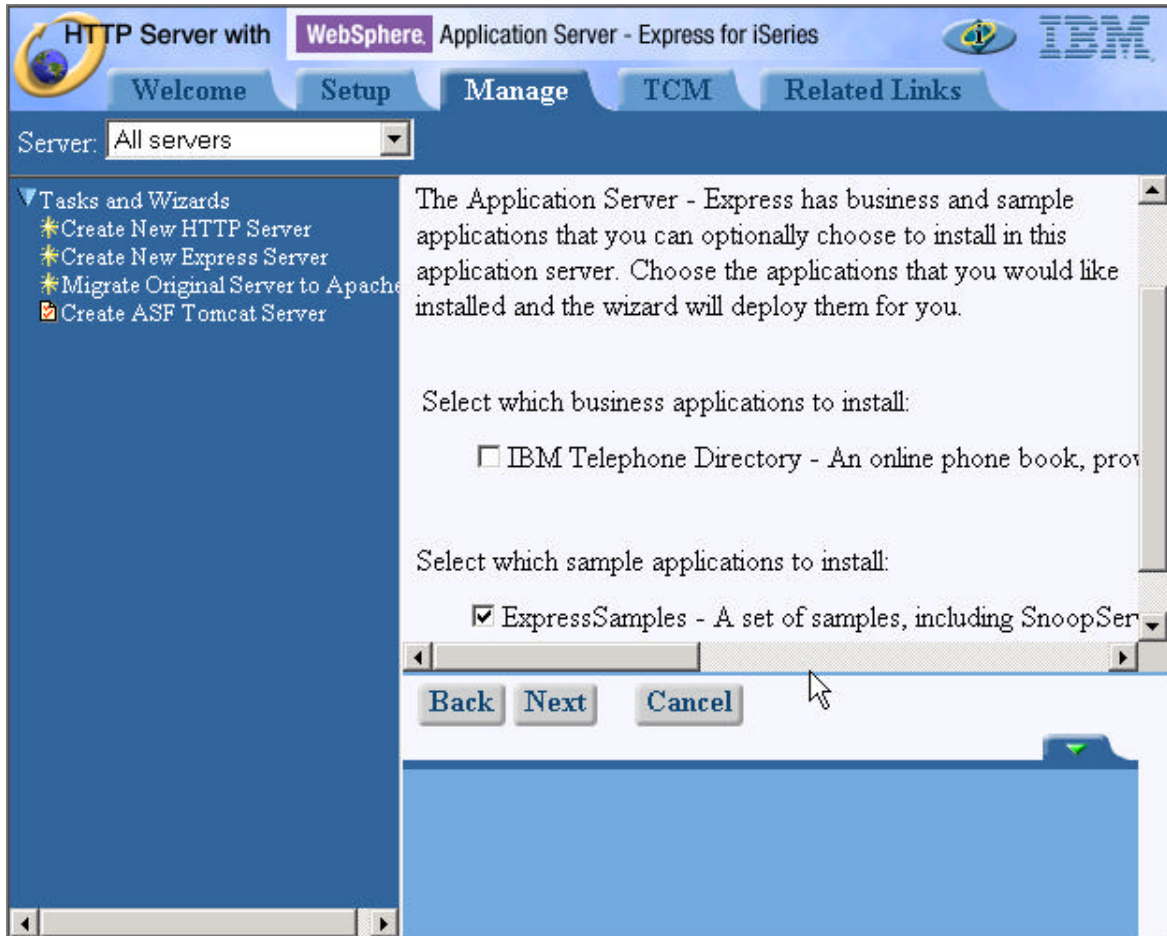
Click the **Next** button.

___ 13. The wizard parameter entry process is now complete. Double check your server names and the TCP/IP port settings to ensure they are correct. After verifying your settings are correct, **click** the **finish** button to create the new WebSphere Application Server and HTTP Powered by Apache server instances.
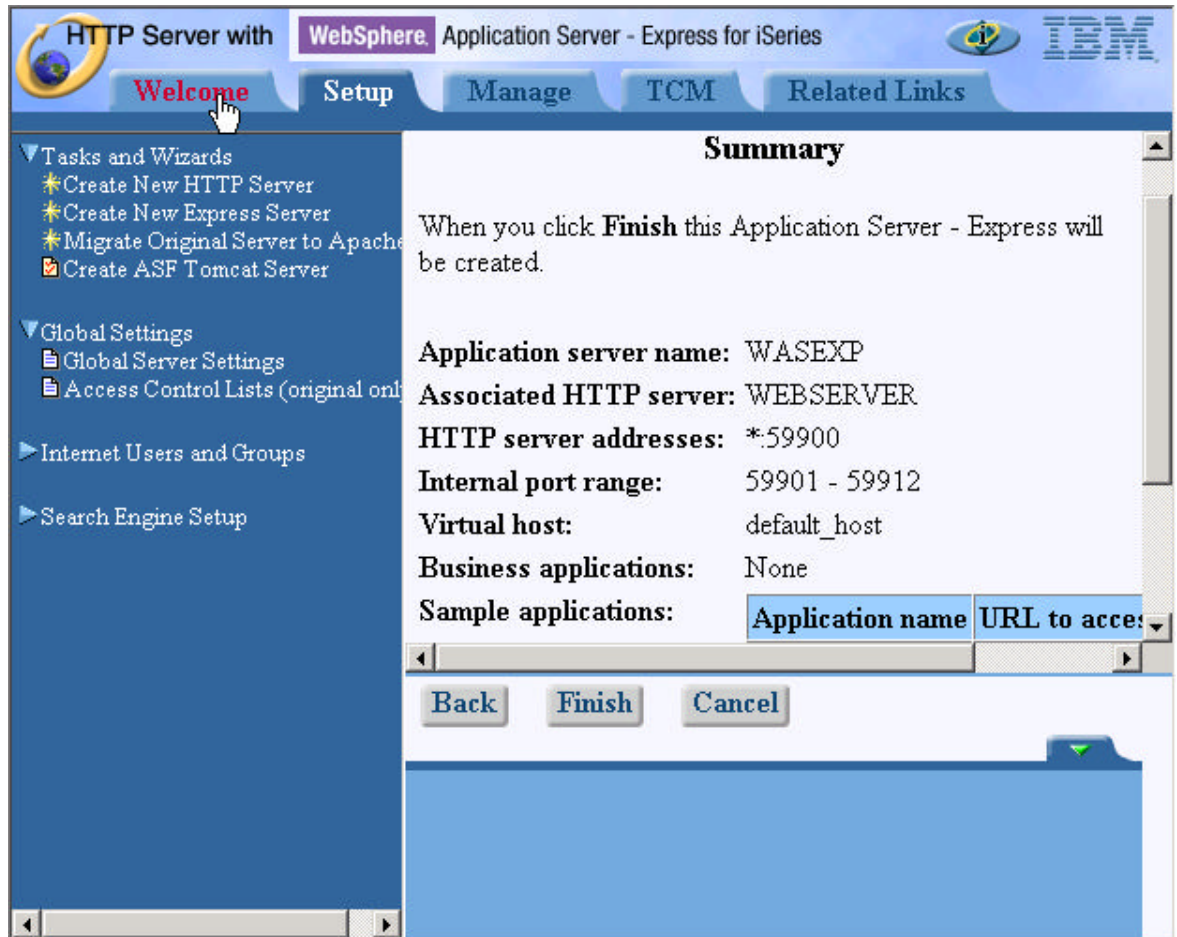
__ 14. Depending on the size of the iSeries server being used to complete the lab, it may take 3 or more minutes for your instances to be created.

Under the Server list box with your instance it will show status as **" Creating "**.
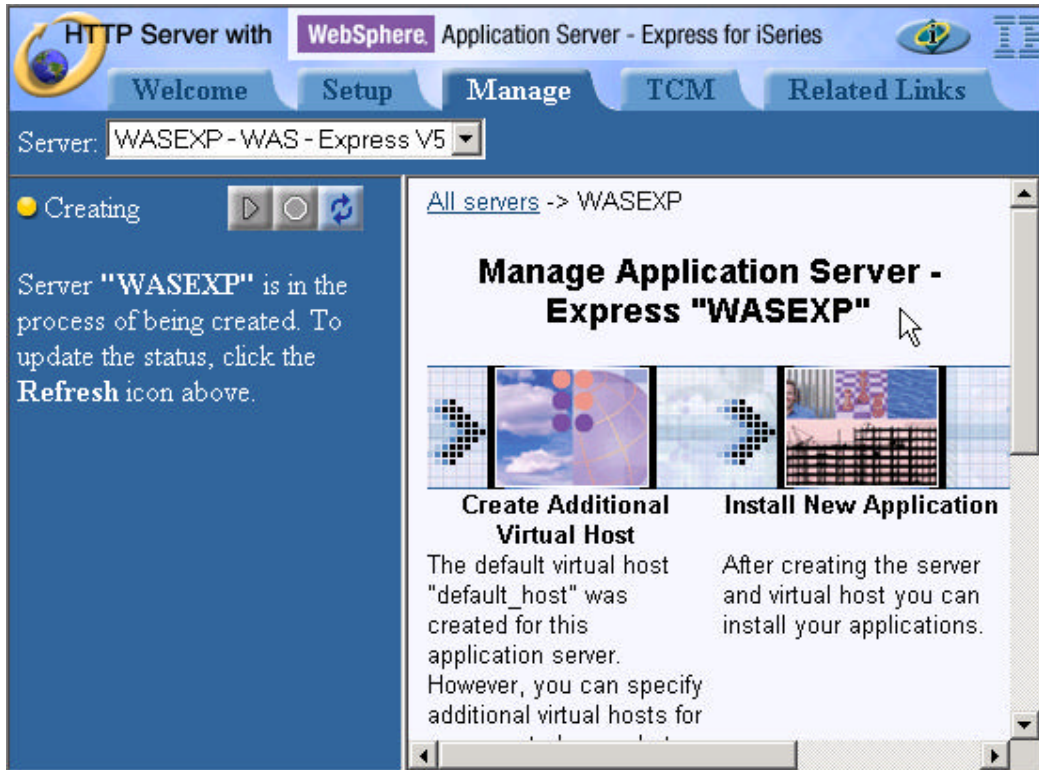
The HTTP server ADMIN job will be consuming significant processor resources during instance creation process.

You may click on the Refresh (⟳ **) button** to update the status every 10-15 seconds. Please avoid refreshing frequently as it will only prolong the completion.

6. Explore the set of WAS Express services that are available via the Integrated Browser Interface

   After your WAS Express and HTTP Server Powered by Apache instances have been created, you will be shown the Manage Application Server - Express "WASEXP" screen.
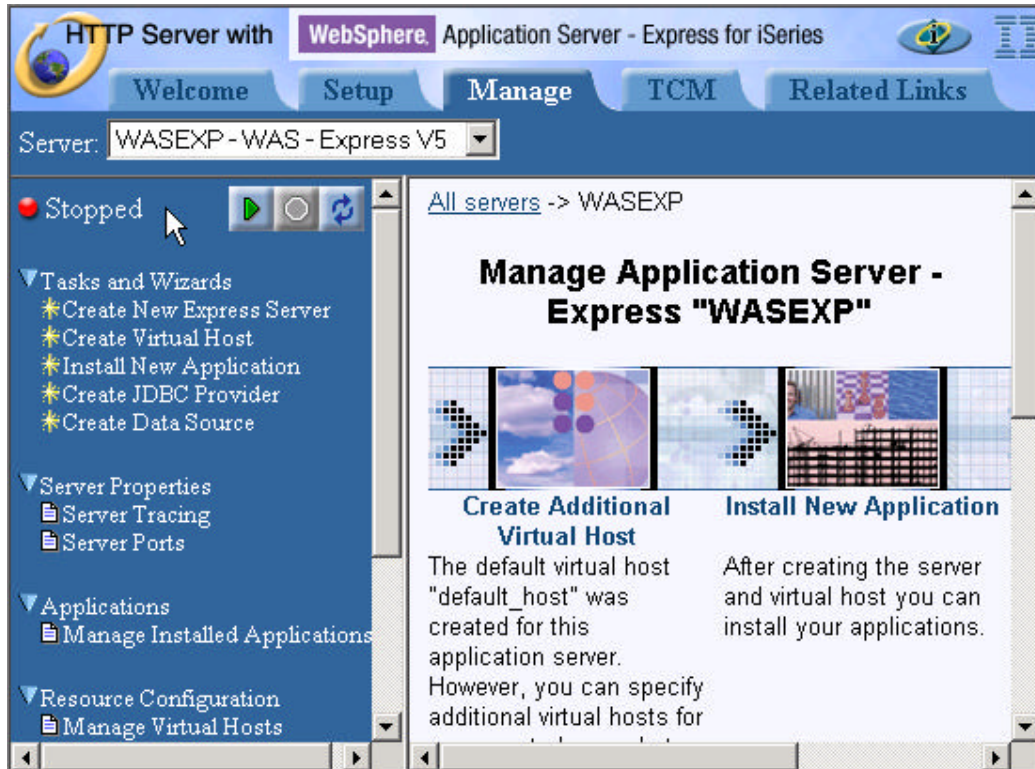
   Take a couple of minutes to explore the set of administrator actions that can be launched from this interface.

7. Enable and start the full function WebSphere Application Server Administrative Console

   The Integrated Browser Interface that you have been using is very adequate for performing simple WebSphere Application Server – Express administrative tasks. In cases where things become more involved, use of the supplied full function Administrative Console is required.

   It is interesting to note that the Administrative Console itself is a WebSphere based application, and must be started like any other application prior to being available for use. By default, the full function Administrative Console is is disabled.

   To start the Administrative Console, your new instance of a WebSphere Application Server must be running.

   __ 1. Locate the Server Administration buttons at the top of the left navigation frame (It may already be selected). **Click** the **Start** button (the one with the green triangle).

   __ 2. Depending on the size of your iSeries machine it will take a minute or two for your WebSphere Express application server instance to start. You can periodically (every 10 seconds or so) **click** the **refresh** button to determine when your application server has started.

   __ 3.
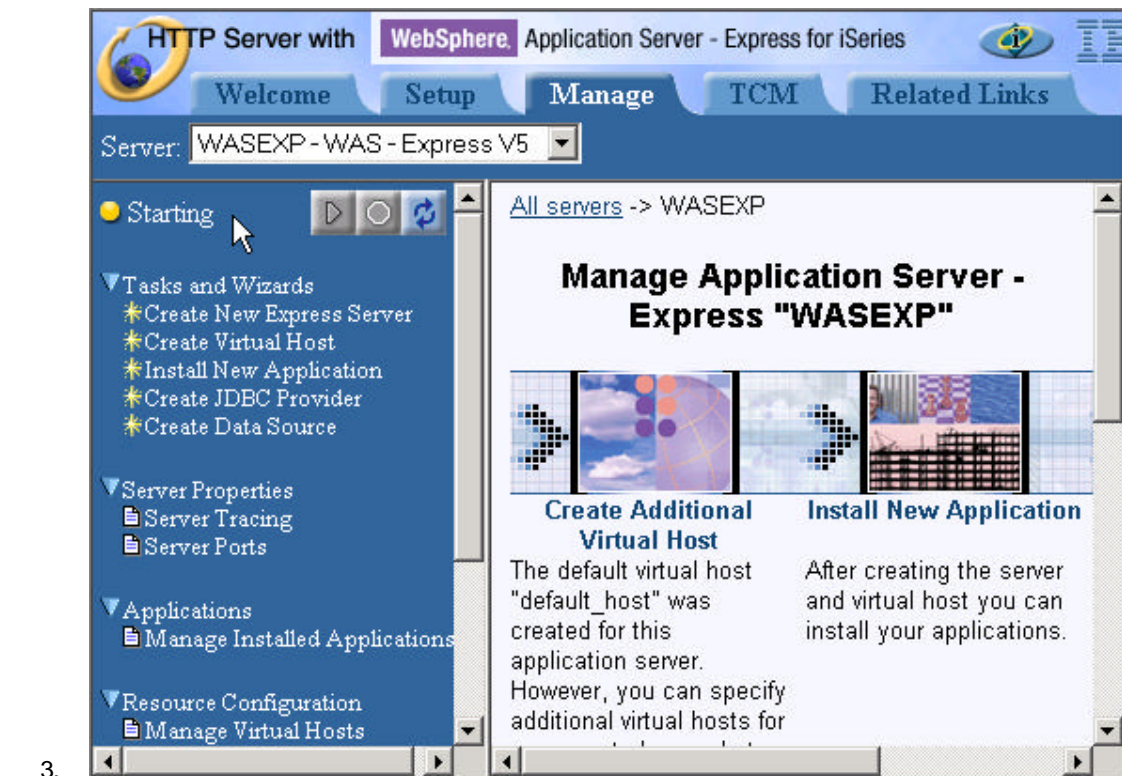
Creating an Instance of WebSphere Application Server – Express for iSeries

With your WebSphere Express instance now running, **click** on the **Manage Installed Applications** link in the left navigation pane.

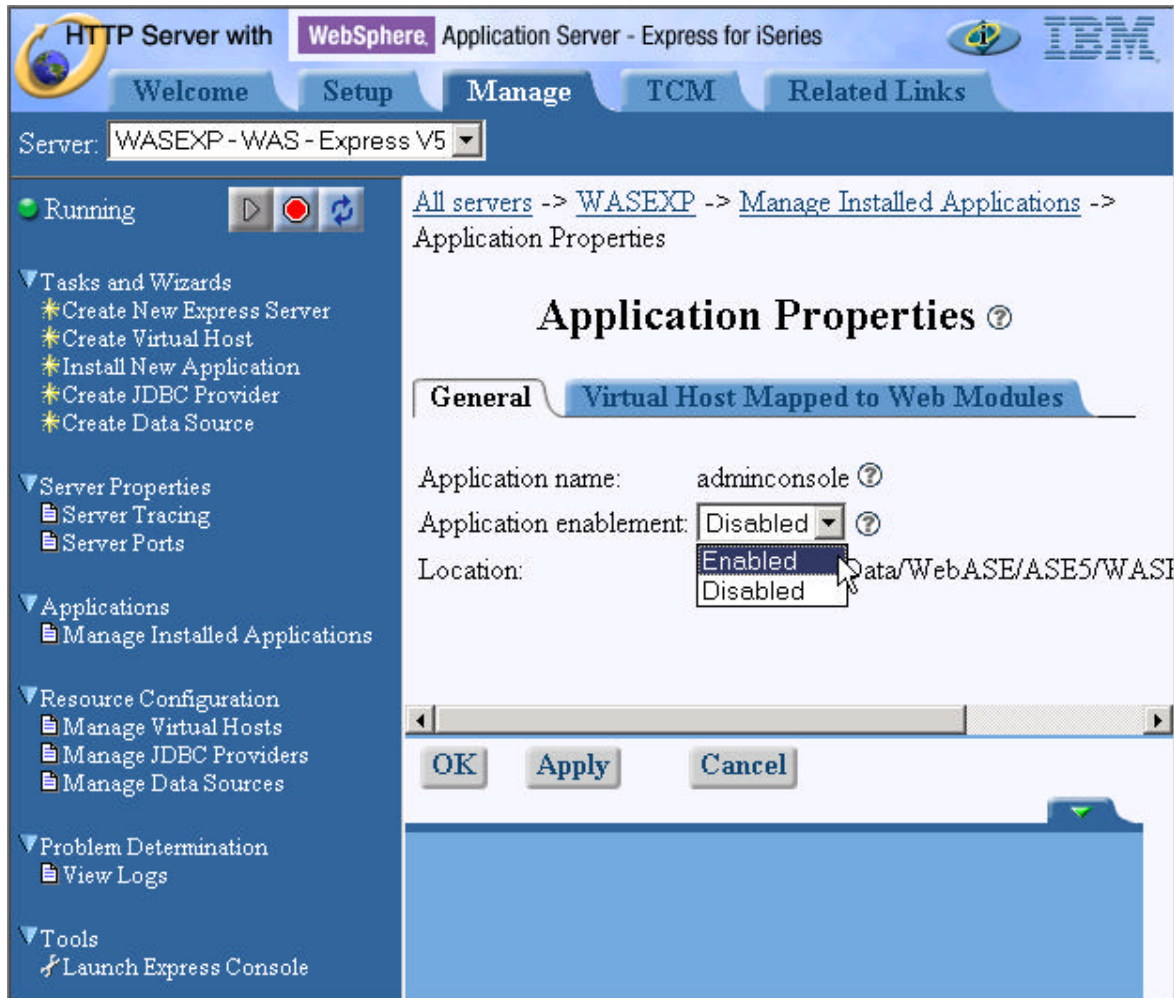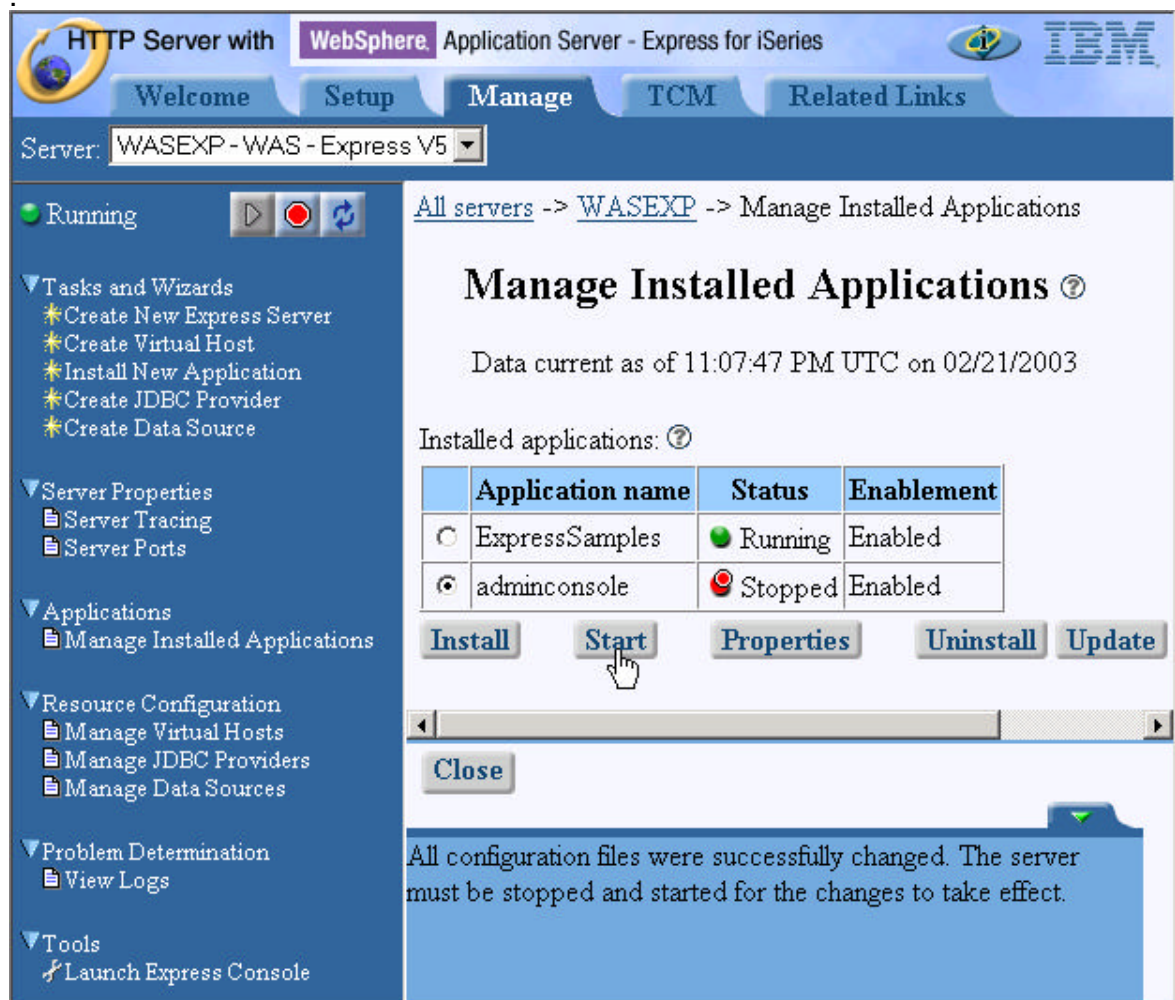The following dialog will be displayed.

__ 18. **Select** the **adminconsole** Application name, and **click** on the **Properties** button.

__ 19. The Application Properties form will be displayed. **Click** on the **General Tab** if it is not already in focus.

__ 20. **Click** on the **Application Enablement pull-down list** and **select Enabled**.

__ 21. **Click OK** at the bottom of the Application Properties form to save the changed properties and return to the Manage Installed Applications form.

Creating an Instance of WebSphere Application Server – Express for iSeries

___ 22. Back at the Manage Installed Applications form, with the adminconsole still
    selected, **click** on the **Start** button to start the Full Administrative Console.

___ 23. After a bit, the form will be updated, indicating that the Administrative Console is
now running.

__ 24. If you are interested in exploring some additional Integrated Browser Interface capaibilities, please perform the following steps. If you are pressed for time, please feel free to skip to the next major step in the sequence.

I. Notice the installed applications and their status *.* **Select the ExpressSamples option**.

II. Note the additional options for stopping the application or viewing the properties. **Click on the Properties button**.

III. 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. **Click** on the **Virtual Host Mapped to Web Modules** tab.

IV. Notice that there is one web module. **Select** the radio button next to the **web module** name. Notice that you can now assign a different virtual host to this web module.

V. Ensure the virtual host remains default_host and then **click** the **Cancel** button.

VI. **Click OK** to the **confirmation question** regarding leaving the form.

__ 25. When completed with your exploring, **Click** on the **Close** button at the bottom of the form to exit the Manage Installed Applications dialog.

__ 26. Back at the Express Configuration Console, **click** the **Server Ports** option under the **Server Properties** category.

You should see the above table listing several services and their associated TCP/IP ports.

Notice the two Admin service ports. There are also HTTP transport services for these ports. This is for the full function administrative console. The first port is for HTTP (nonsecure), the second port is HTTPS (secure).

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

**Press** the **Close** button to exit out of the Server Ports display.

Creating an Instance of WebSphere Application Server – Express for iSeries

8. Configure the new WAS Express instance to enable multiple language encodings

___ 1. Now that the full Administrative Console application has been started, it can be used to enable the multiple language encoding support required for successful execution of the WebFacing runtime server. **Click** on the **Launch Express Console** option under the Tools category. You should see another browser window pop up, taking you to the full function administrative console application. Depending on the size of the iSeries server being used, it may take a few seconds for your console application to appear. Eventually you should see the console logon screen.

___ 2. **Enter** some unique **UserID** and **press** the **OK** button. Note the supplied UserID is associated with a "Session" of the full function WebSphere Administrative Console, and does not have to be a valid iSeries UserID.
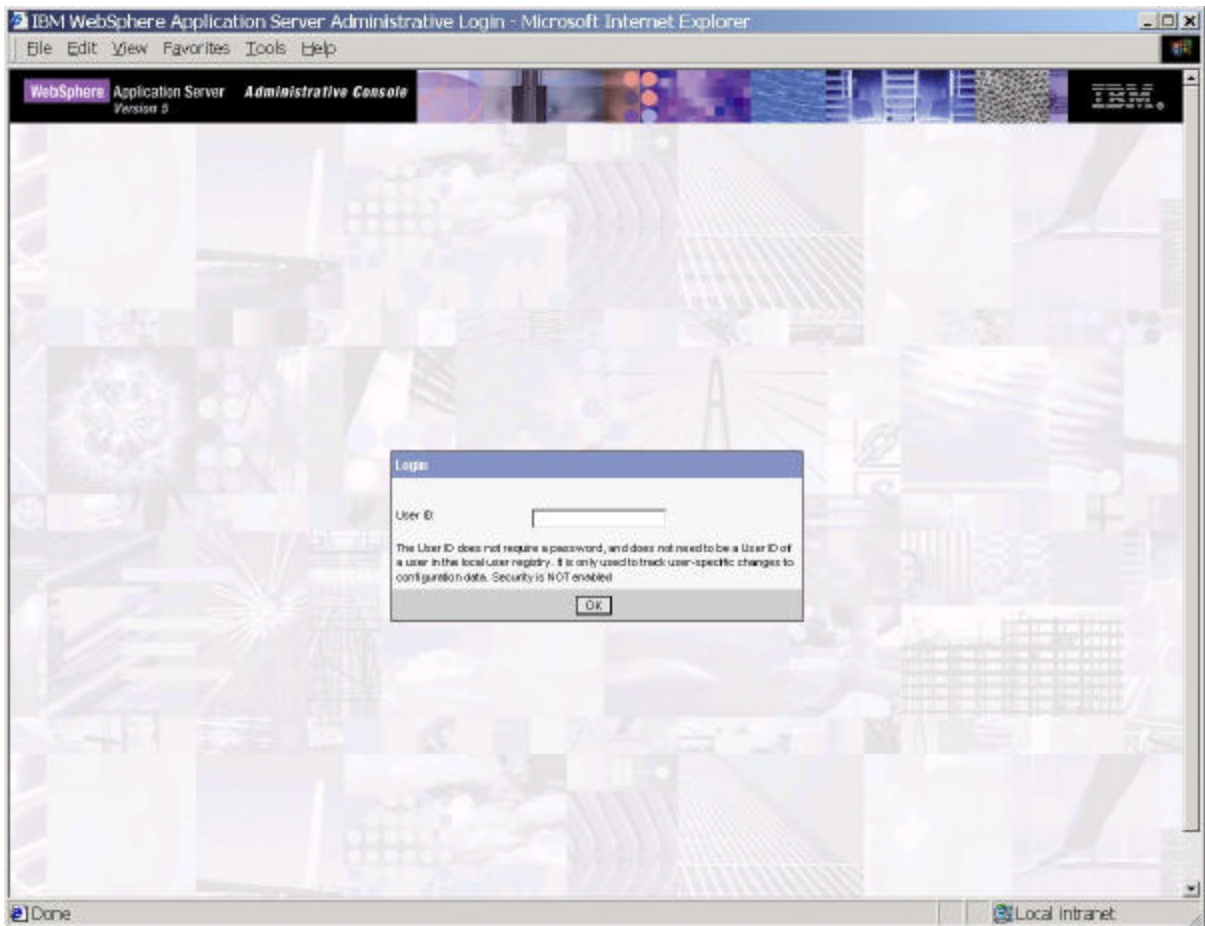
__ 3. The first time the administrative console application is run, it will take a moment or two for it to come up. Please be patient. You should eventually see the console 'home page', as shown in the next diagram.
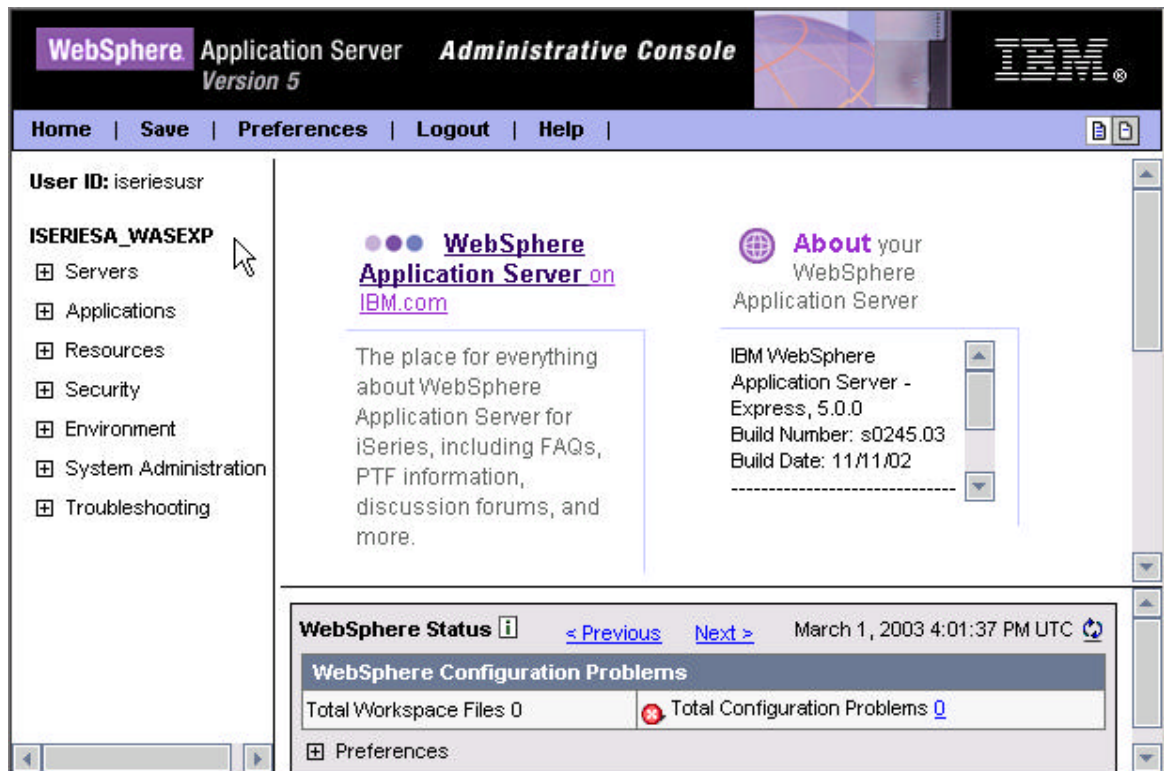
__ 4. Within the navigation frame on the left side of the browser window, notice the User ID: parameter you entered and your node name. Under the server name, **click** the **Servers option** and you should see an Application Servers option.

__ 5. **Click** the **Application Servers link**. It may take a moment or two for the page to come up.

__ 6. You should see your application server and node listed, as shown in the next diagram.
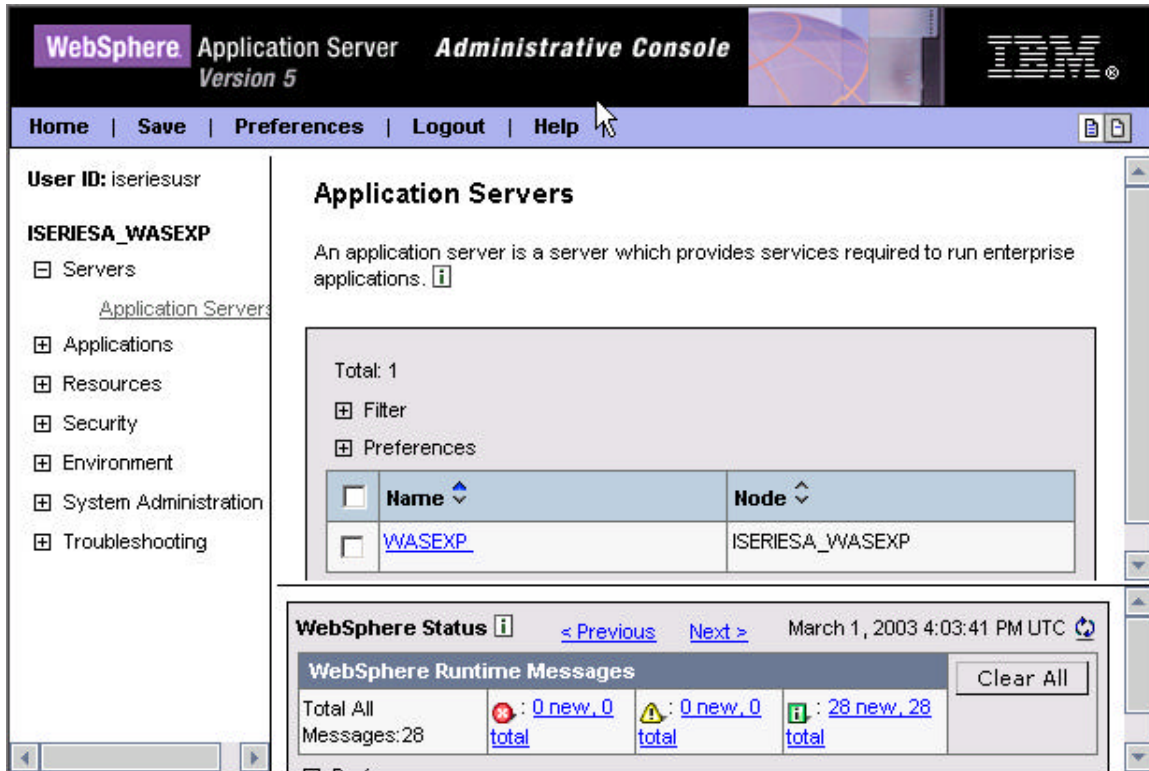
__ 7. Click on the application server link (**WASEXP**). It may take a moment or two for it to come up.

__ 8. 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** on the **Process Definition link**.

__ 9. You should see a list of general properties and additional properties on the Configuration tab. **Click** on the **Java Virtual Machine** link in the Additional Properties section.

Creating an Instance of WebSphere Application Server – Express for iSeries

___ 10. 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.**

___ 11. You should see the Custom Properties panel, with none currently defined. **Click** on the **New** button.

___ 12. For the custom properties entry, specify

Name: **client.encoding.override (in lower case)**
Value: UTF-8 (in upper case).
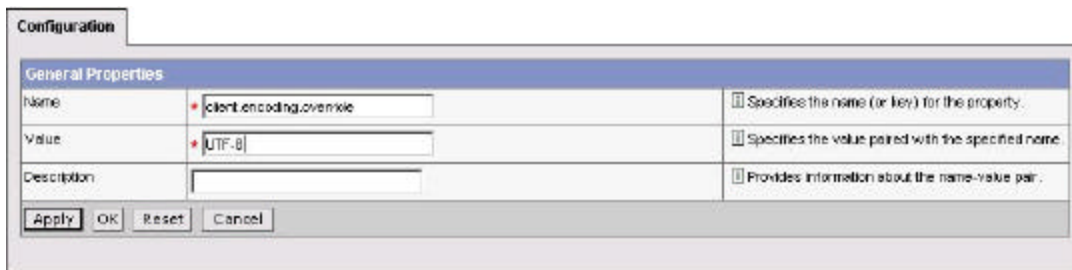
___ 13. Click the OK button.

___ 14. 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.

___ 15. **Click** on the **Save** link.

___ 16. You should see a Save to Master Configuration option screen appear. **Click** on the **Save Button**.

__ 17. After confirming the configuration save, you should be back at the main administrative console screen.

__ 18. **Click** the **Logout** option in the toolbar at the top of the window, and **close the browser session.**

__ 19. Changes to the Java Virtual Machine (JVM) settings require that the application server be restarted. Your next step is to go back to the Integrated Browser Interface, restart your application server instance, and verify that it is operating properly. **Go back to your Integrated Browser Interface session .**

__ 20. **Click** the **Stop button associated with your WASEXP server.**   You can periodically (every 10 seconds or so) click the refresh button to determine when your application server has stopped.

__ 21. **Click** the **start** button (the one with the green triangle). Depending on the size of the iSeries server being used, it will take a minute or two for your instance to start. You can periodically (every 10 seconds or so) click the refresh b utton to determine when your application server has started.

9. Regenerate the HTTP server plugin from the full function administrative console.

A feature of the WAS Express integrated browser interface is that it automatically regenerates the HTTP Server plugin file for events such as installing a new application.

It is important to note that the full function administrative console **does not** provide this feature. In this step you will learn how to manually regenerate the HTTP server plugin within the full function administrative console.

__ 1. Back on the Integrated Browser Interface, restart the full function Administrative Console by **clicking** on the **Launch Express Console** option under the Tools category. You should see another browser window pop up, taking you to the full function administrative console application. Depending on the size of the iSeries server being used, it may take a few seconds for your console application to appear. Eventually you should see the console logon screen.

__ 2. Again, **Enter** some u nique **UserID** and **press** the **OK** button. Note the supplied UserID is associated with a "Session" of the full function WebSphere Administrative Console, and does not have to be a valid iSeries UserID.

__ 3. Under the server name, **click the Environment option,** and you should see the Update Web Server Plugin option.
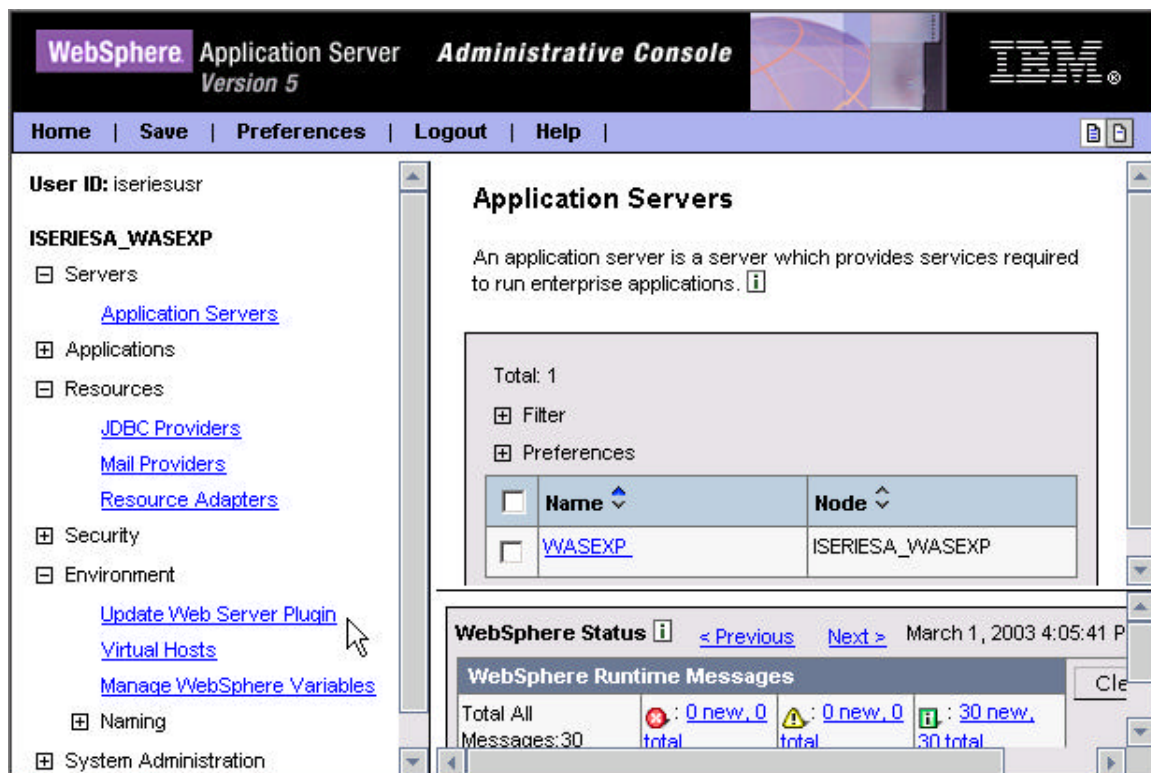
__ 4. **Click on the Update Web Server Plugin link**. In a moment or so you should see the Update web server plugin configuration screen.

__ 5. **Click on 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.

Message(s)
ℹ The web server plugin configuration was updated successfully

__ 6. **Click on the View or download** the current web server plugin configuration file link.

__ 7. Note that the plugin file is in XML (eXtensivle Markup Language). Also, note the TCP/IP port settings for the WAS Express internal HTTP server task and the external Apache HTTP server task.

__ 8. **Select the Servers category**, then the **Application Servers link. Click on your WebSphere Express Instance**, then the **Web Container property under Additional Properties.**

__ 9. **View the HTTP Transports property.**
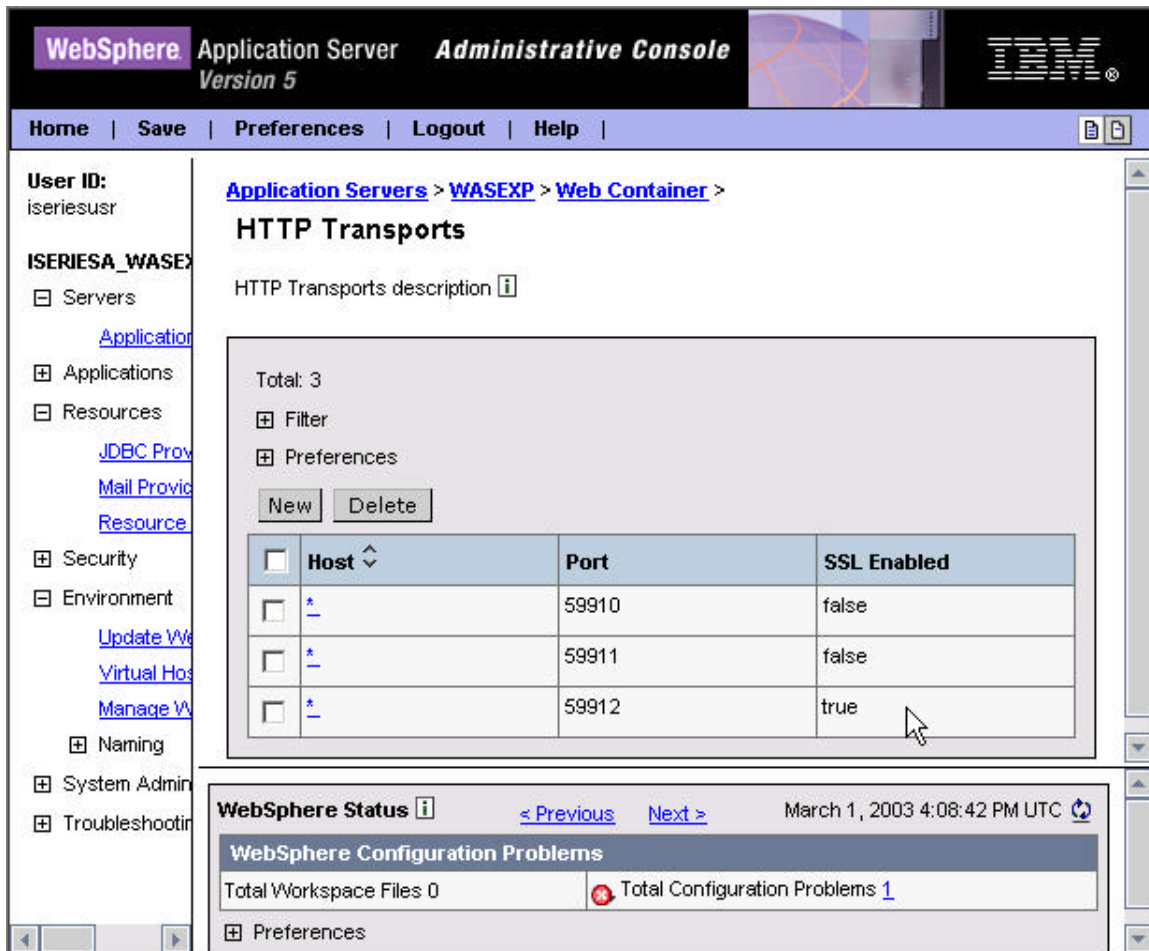
 Note that there are ports defined for the WAS Express internal HTTP server, and the two ports for the full function administrative console. Notice that one of the admin ports is SSL enabled.

__ 10. If you have time, feel free to browse thru some of the other categories. **DO NOT MAKE ANY CHANGES AT THIS TIME!**

__ 11. When you have finished browsing thru the administrative console options, **ensure you logout of the session**.

__ 12. **Close** out this **browser session.**

10.   View the iSeries job information (Optional Exercise)

In the preliminary 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.**

__ 2.   .At the command line, enter **WRKACTJOB** and press enter.

__ 3.   Scroll thru the job activity until you **find subsystem QASE5**.

__ 4.   **Locate your particular server job** (i.e. **WASEXP**) and **choose option 5 (work with job)**.

__ 5.   **Select option 10** to work with the job log. **Press the F10 key to view the detailed job information.**

__ 6.   **Locate the message "WebSphere application server WASEXP (*yourservername*) ready."**

__ 7.   **Place the cursor on this message line** and **press the F1 key** to display the detailed message.

__ 8.   The message should state which port or ports that administrative requests can be handled.

__ 9.   **Questions:**

       Which port(s) are listed?

       ____ **all ports the server is listening on**

       ____ **only the secure and nonsecured full function admin console ports**

       ____ **only the nonsecured full function administrative console port**

11. View the WebSphere Application Server Log Information (Optional Step)

   __ 1. **Return to the Integrated HTTP Server – WebSphere Application Server – Express for iSeries Browser Interface**.

   __ 2. At the Express configuration console, **click the View Logs** option under the Problem Determination category. Note the 4 different log files and their location in the OS/400 IFS.

   __ 3. **Select the SystemOut.log file** and **press the View button**. A new window should pop up, showing you the log file contents.

   __ 4. 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.

   __ 5. **Close** the **Log File Viewer**.

   Questions

   Java 2 security is _____enabled   _____disabled

   What service is listening on port 59901? _____

   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.

Answers

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

This concludes the lab exercise.