WebSphere Application Server V7

Flexible management lab

What this exercise is about

The objective of this lab is to acquaint you with the Flexible System Management capabilities available in WebSphere Application Server V7. This mechanism differs from the existing style of synchronous invocation/response calls through wsadmin or Java APIs by offering an asynchronous job queuing mechanism for administration purposes. This lab will guide you through creating and configuring the various profiles involved.

Lab requirements

The system on which you will exercise this lab must have a supported operating system and a proper installation of WebSphere Application Server V7. For more information on supported operating systems, see the WebSphere Application Server V7 Information Center. In addition, the system must have the following resources available:

- Approximately 500MB of hard drive space to store the installation images
- An appropriate installation of WebSphere Application Server V7
- Another 500MB of hard drive space for the installed product

What you should be able to do

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

- Create profiles for a base server environment, an administrative agent, and a job manager
- Register the base node with the administrative agent
- Register the base node with the job manager
- Connect to the job manager and:
    - start an application server
    - backup log files from an application server

Introduction

WebSphere Application Server V7 introduces a new style of system management called flexible management. It differs from the existing style of synchronous invocation/response calls through wsadmin or Java APIs by offering an asynchronous job queuing mechanism for administration purposes. This asynchronous style is not meant to replace existing WebSphere Application Server installations based on the cell model using deployment manager, node agents, and application servers. Rather, it offers the administrators additional management options not available previously:

- Management of multiple stand-alone application servers, up to a server farm containing hundreds of application servers.
- Coordinate management actions across multiple deployment managers.
- Management of branch servers geographically dispersed and reachable only through low bandwidth, high latency network.
- Asynchronous administrative job submissions that
    - Take effect at a specified time
    - Expire after a specified time
    - Recur at a specified time interval
    - Notify the administrator through e-mail when job is complete.

This lab is divided into the following parts.

Part 1: Create a job manager profile

Part 2: Create an administrative agent profile

Part 3: Create an additional application server profile

Part 4: Register the stand-alone application server with the job manager and administrative agent

Part 5: Use the job manager to start a server

Part 6: Explore the Job Manager and Administrative Agent consoles

Part 7: Submit a job to backup the log files

Exercise instructions

Instructions and subsequent documentation use symbolic references to directories, which are listed as follows:

Reference Variable	Windows Location	Linux UNIX Location
<WAS_HOME>	C:\Program Files\IBM\WebSphere\AppServer	Linux /opt/WebSphere/AppServer AIX /usr/WebSphere/AppServer
<LABFILES>	C:\Labfiles	/Labfiles
<hostname>	Host name or host address for the machine where the profiles are being created	Host name or host address for the machine where the profiles are being created

Part 1: Create a job manager profile

At the core of flexible management is a new administrative process called the job manager. It is independent of the deployment manager. Stand-alone application servers (and even deployment managers) can make themselves known to the job manager through a registration process. Once registered, administrators may queue up jobs directed at the Stand-alone servers or deployment managers through the job manager.

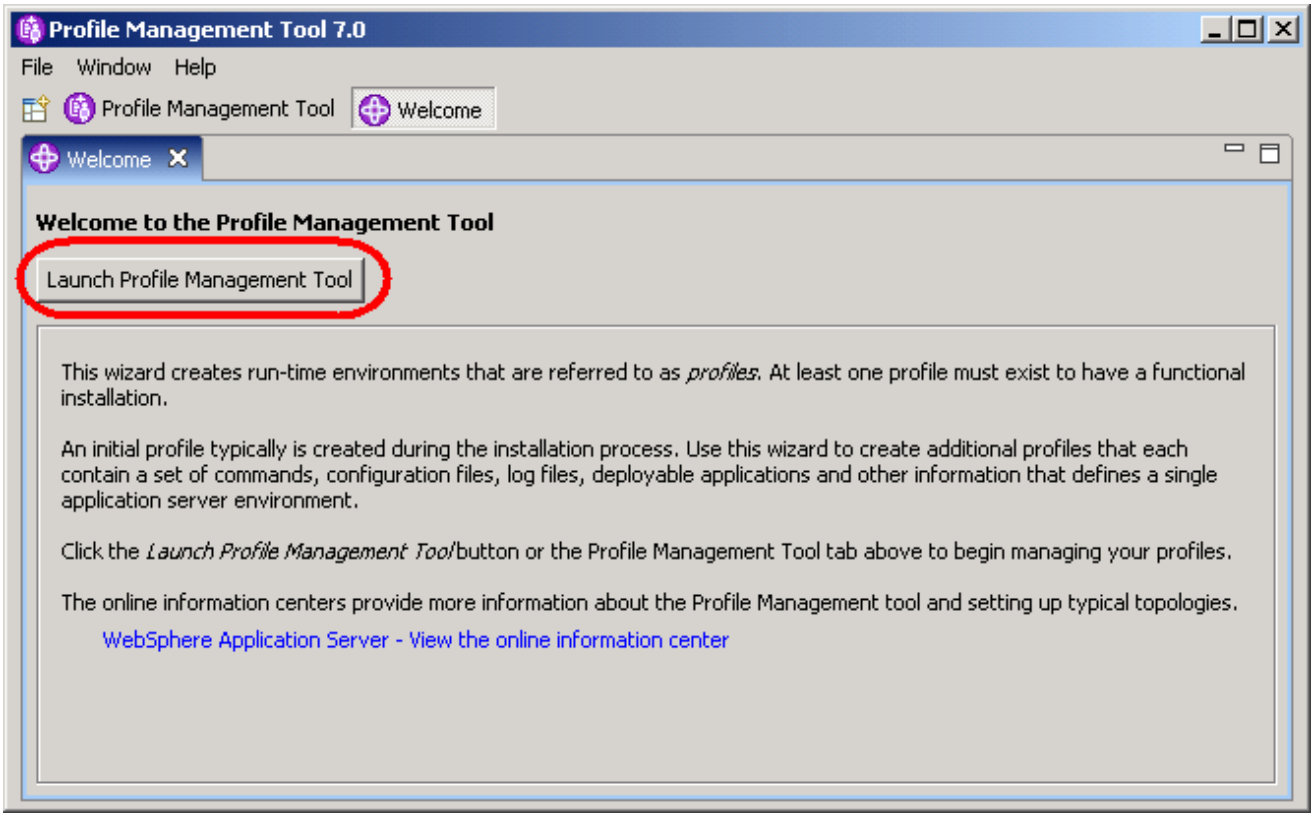
____ 1. Create a job manager profile called **JobMgr01**.

__ a. Start the **Profile Management Tool**. This can be done through the command like using the following commands (this can also be done through the Start -> Programs -> IBM WebSphere -> Application Server Network Deployment V7 -> Profile Management Tool):

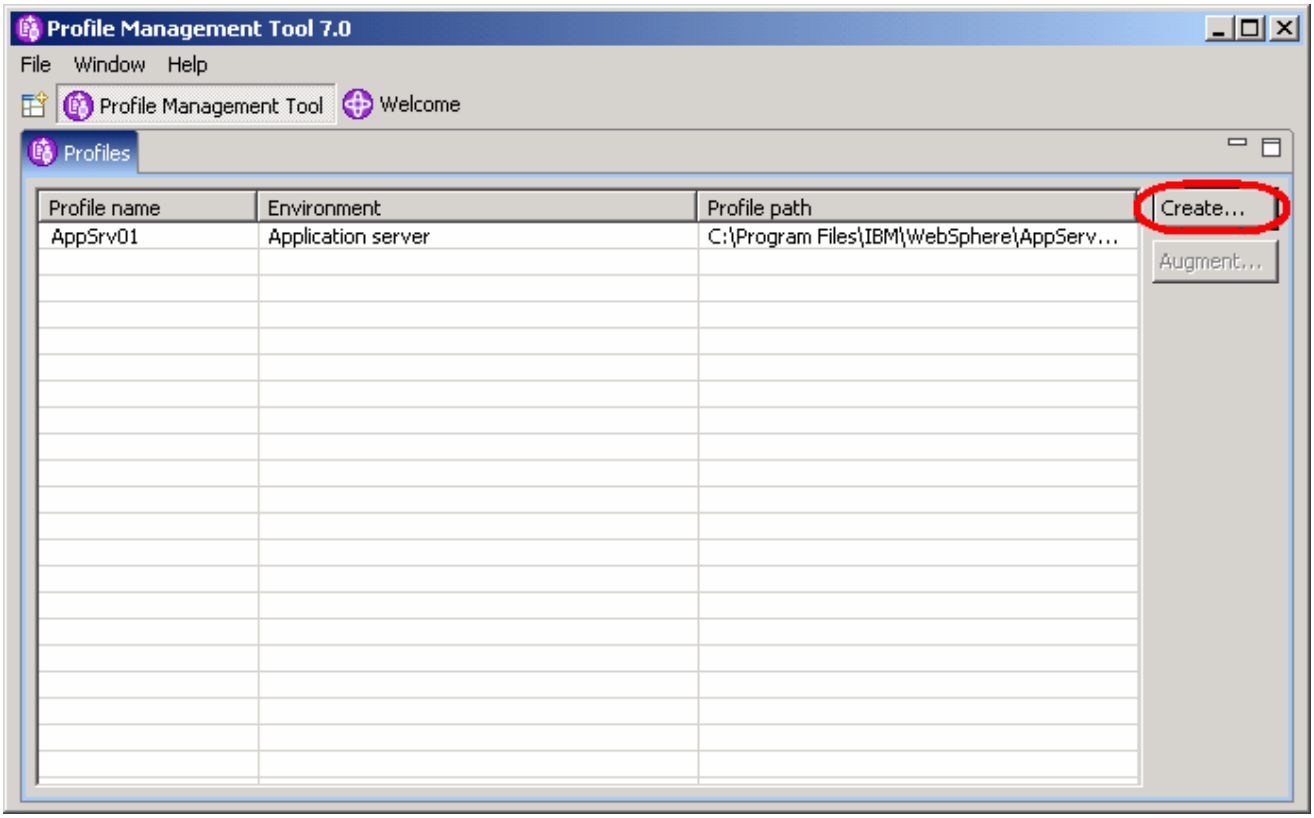
```
cd %WAS_HOME%\bin\ProfileManagement

pmt.bat
```

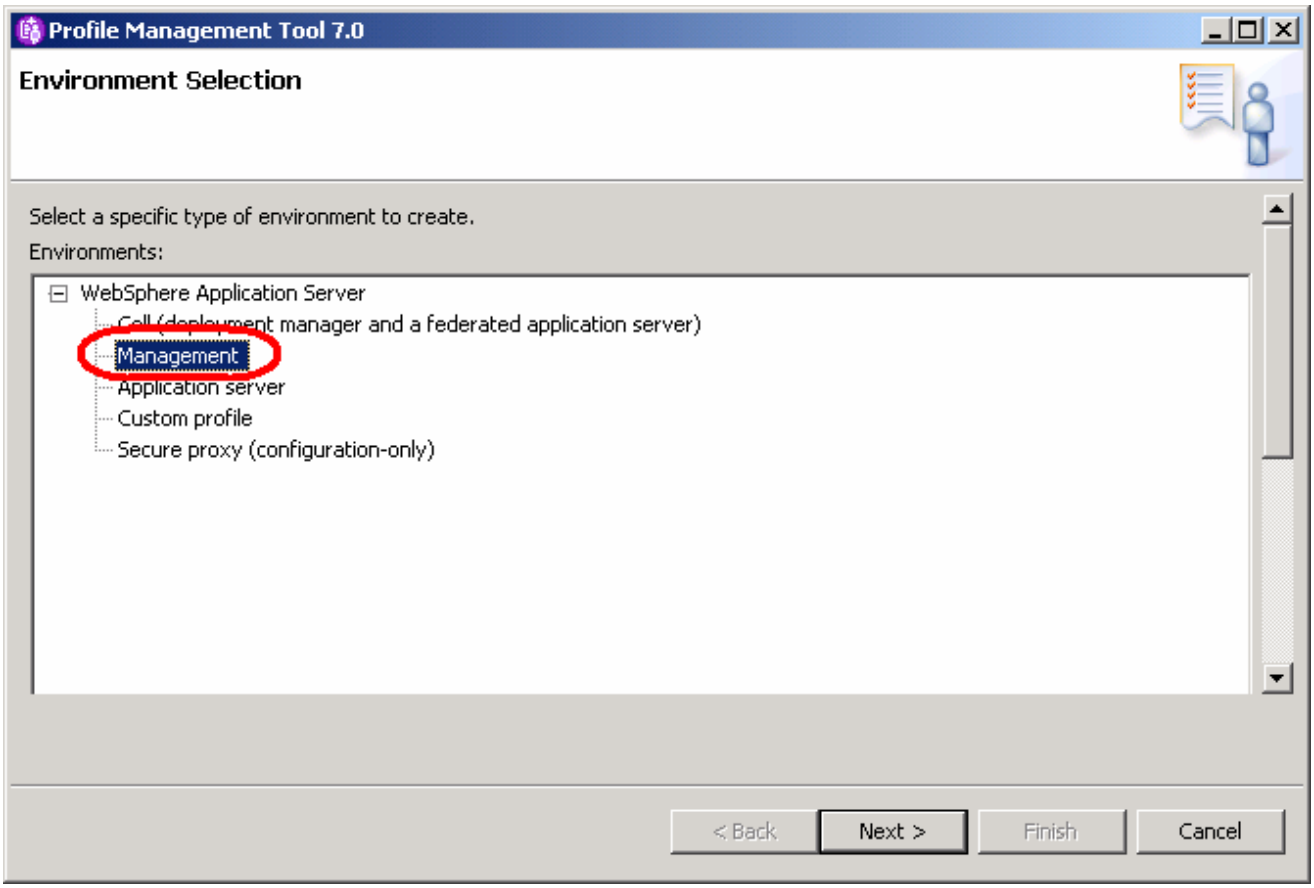
__ b. On the initial screen, click **Launch Profile Management Tool**.



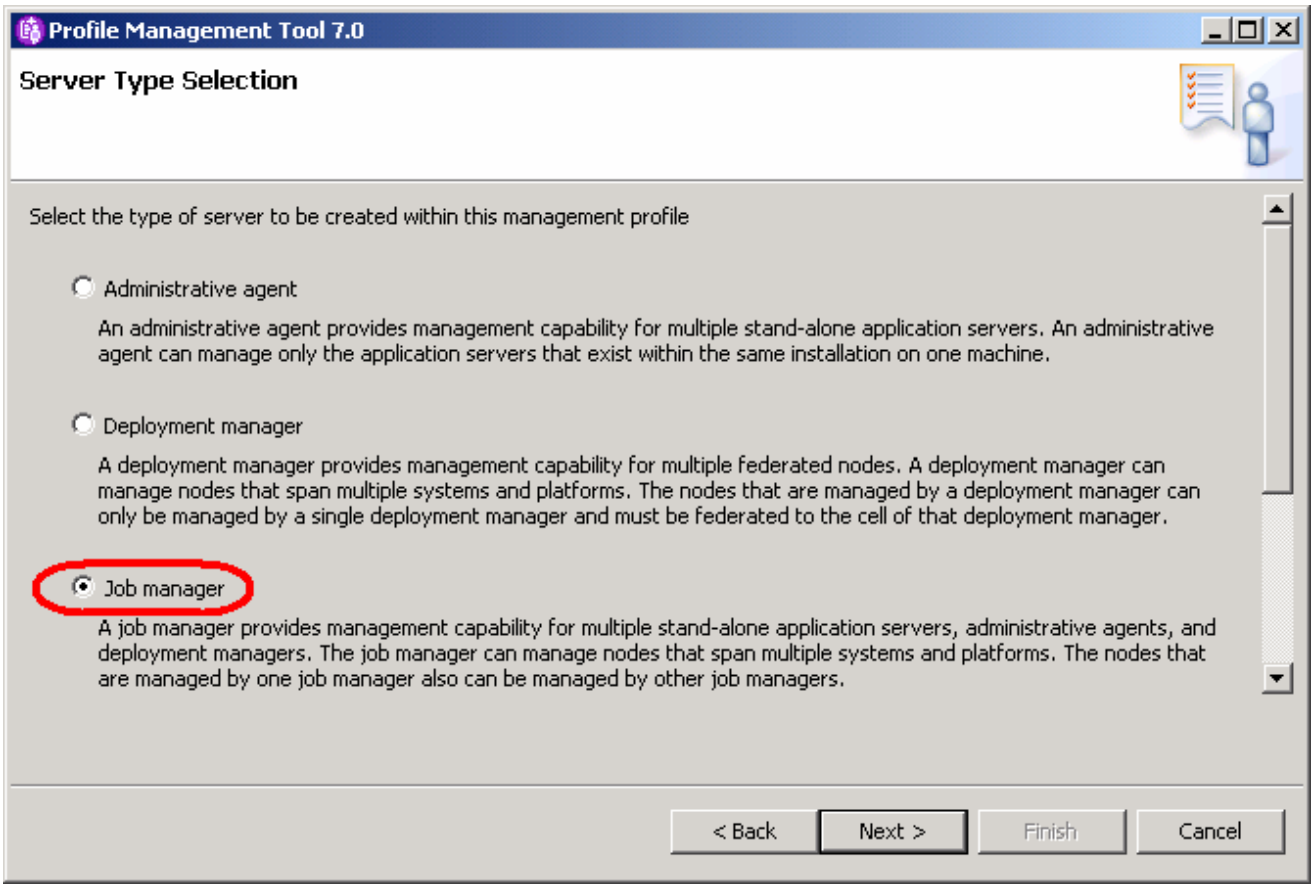
__ c. In the Profiles window, click **Create**. If this is not a new installation, it is possible that other profiles may already exist. They will not be affected by this exercise.



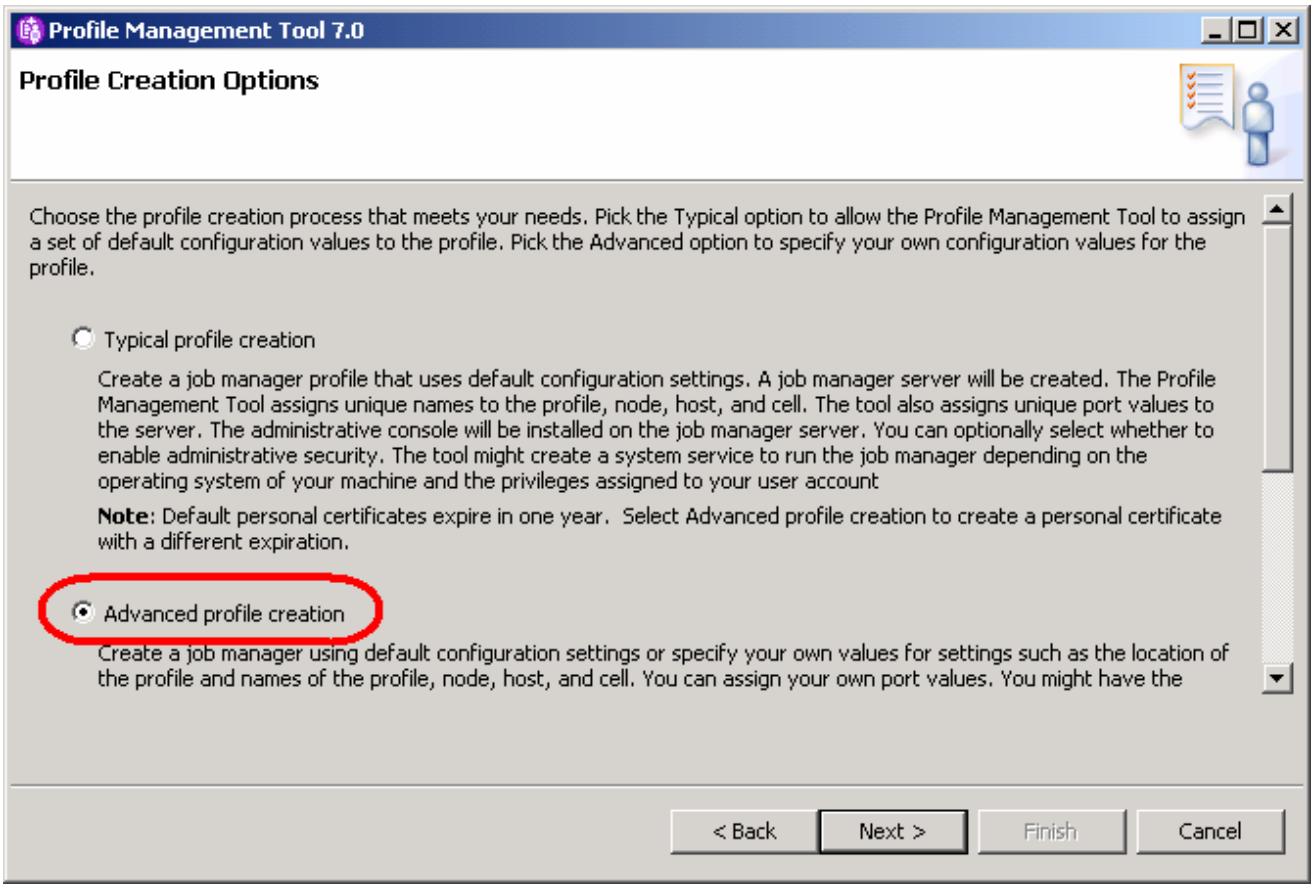
__ d. Select **Management** and click **Next**.



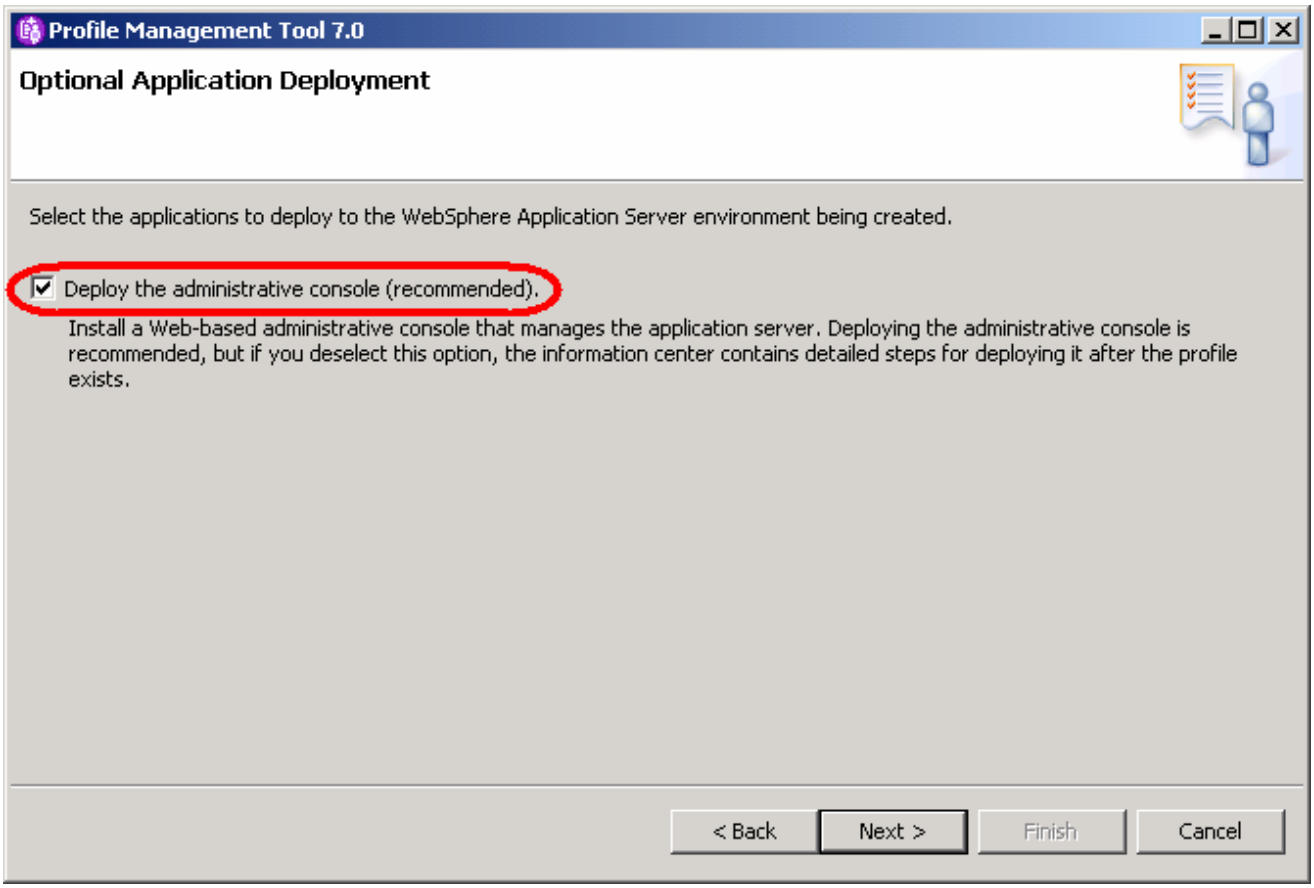
__ e. Select **Job manager** and click **Next**.



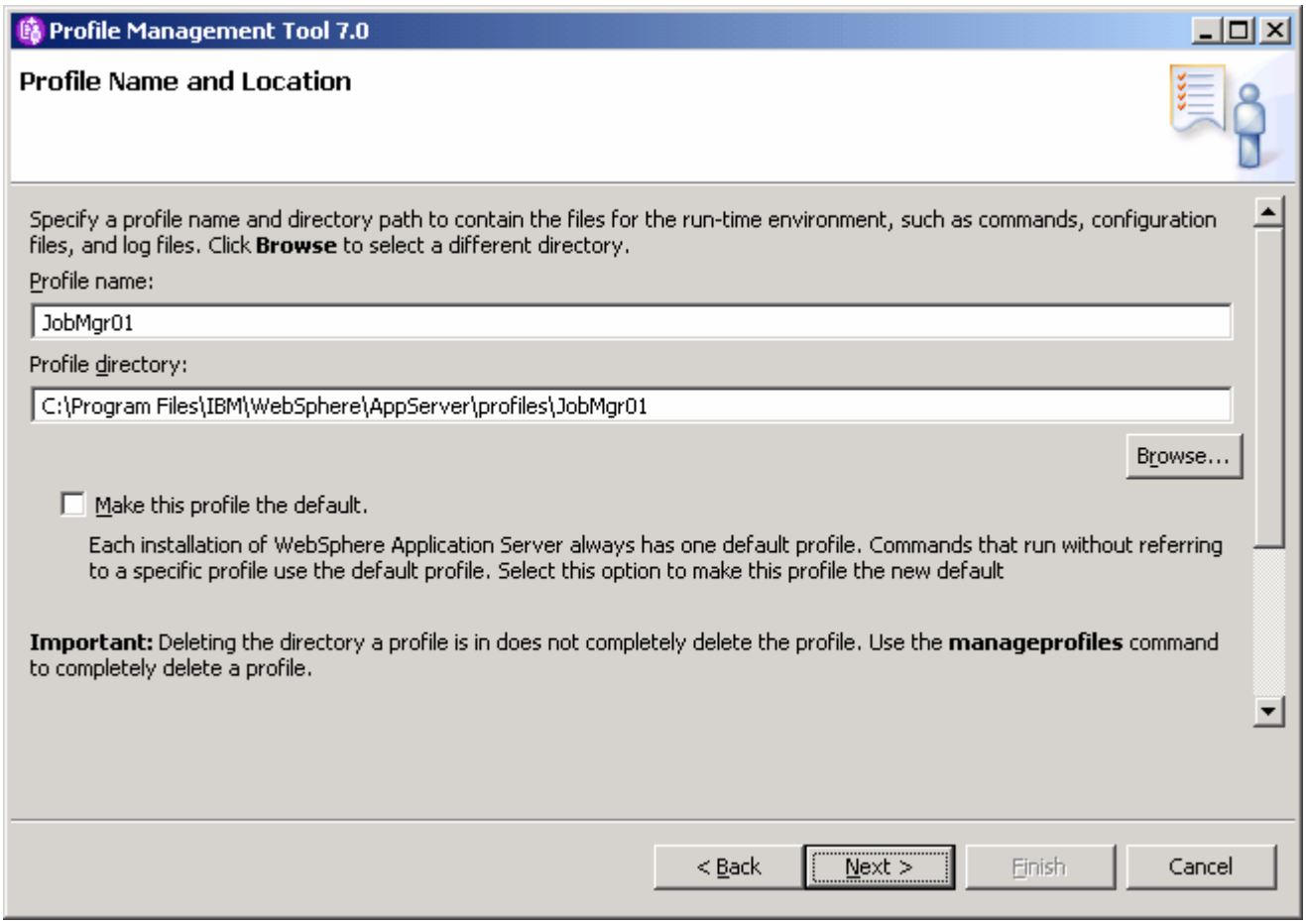
__ f. Select **Advanced profile creation** and click **Next**.



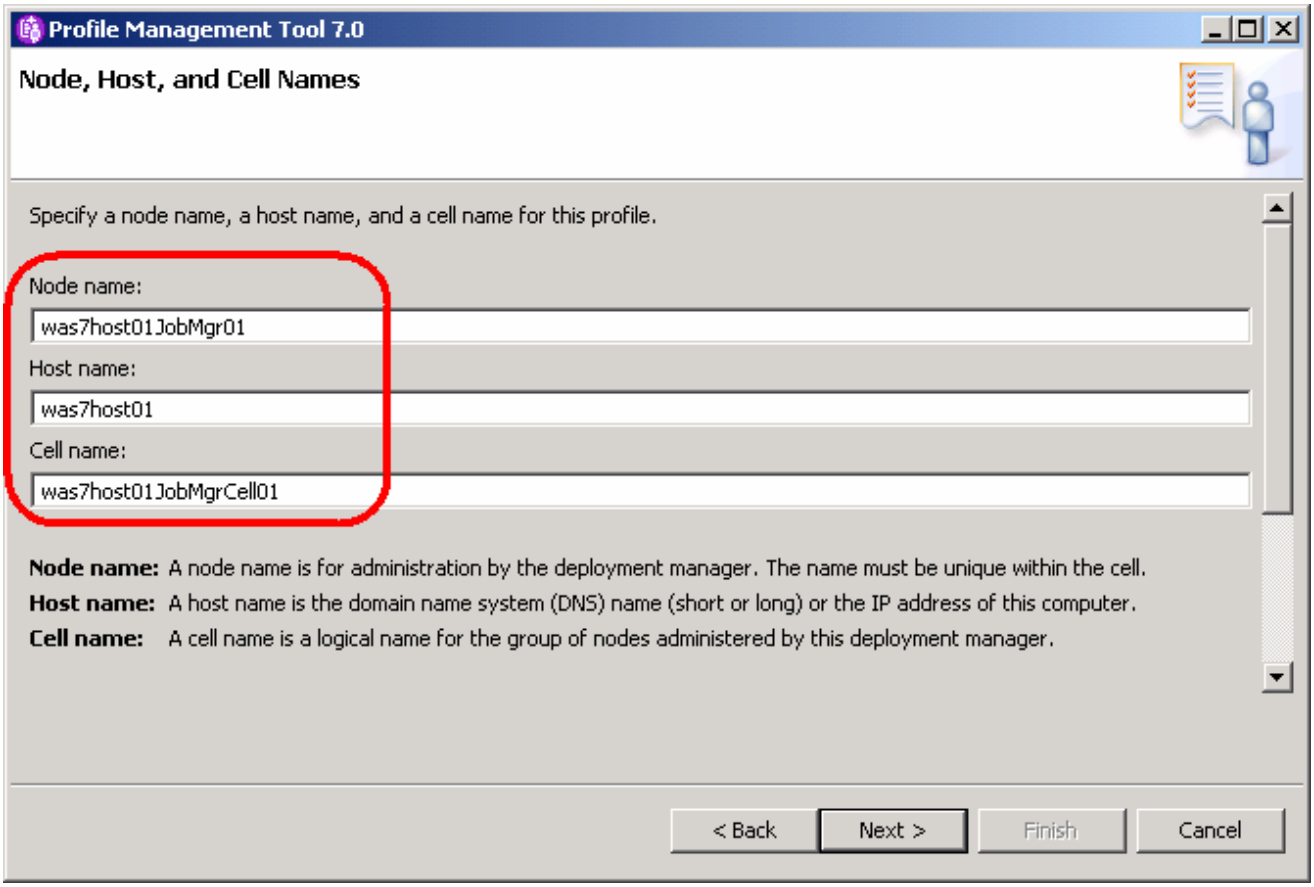
__ g. Accept the default of **Deploy the administrative console (recommended)** and click **Next**.



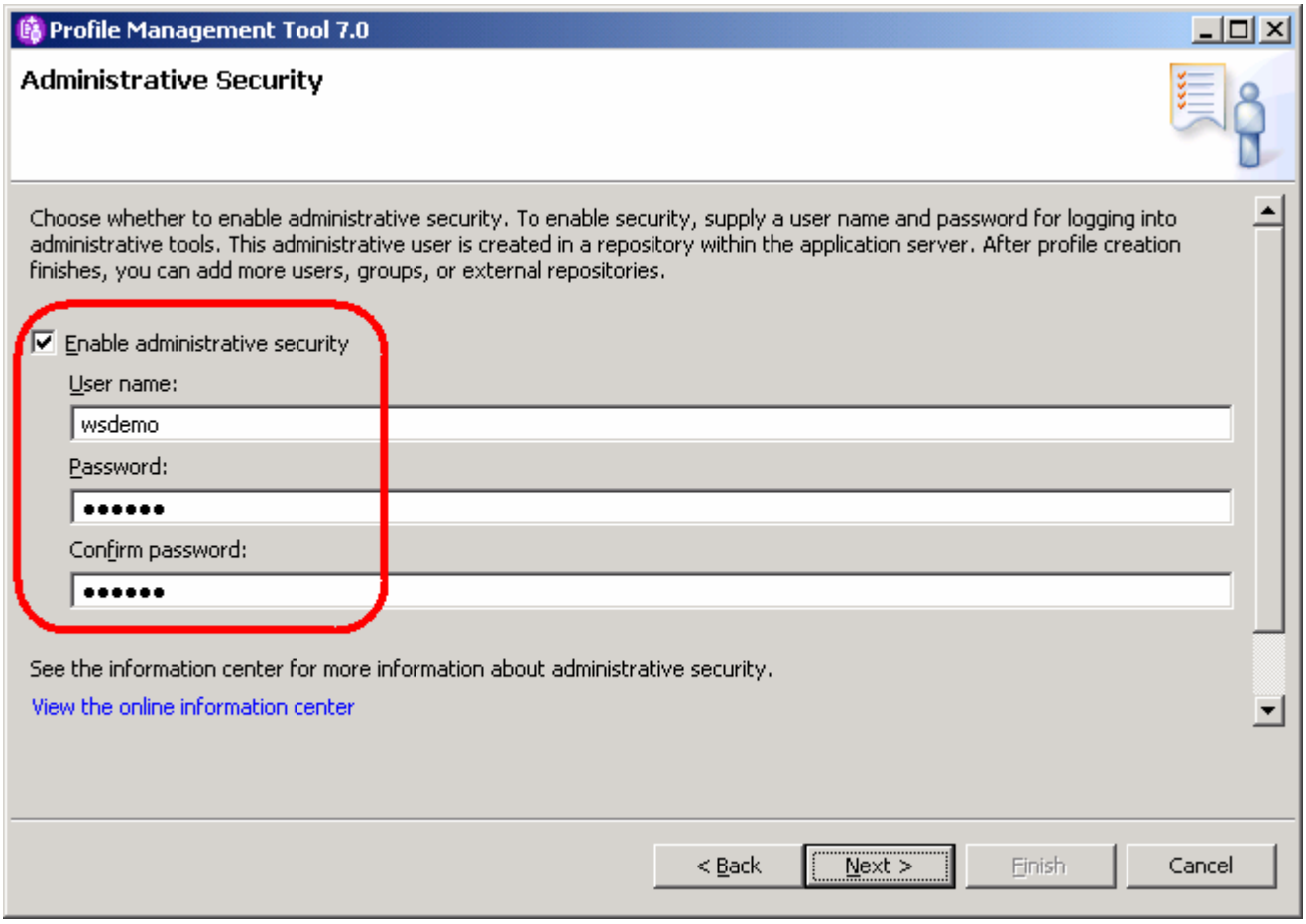
__ h. Accept the defaults for the **Profile name** and **Profile directory** and click **Next**.



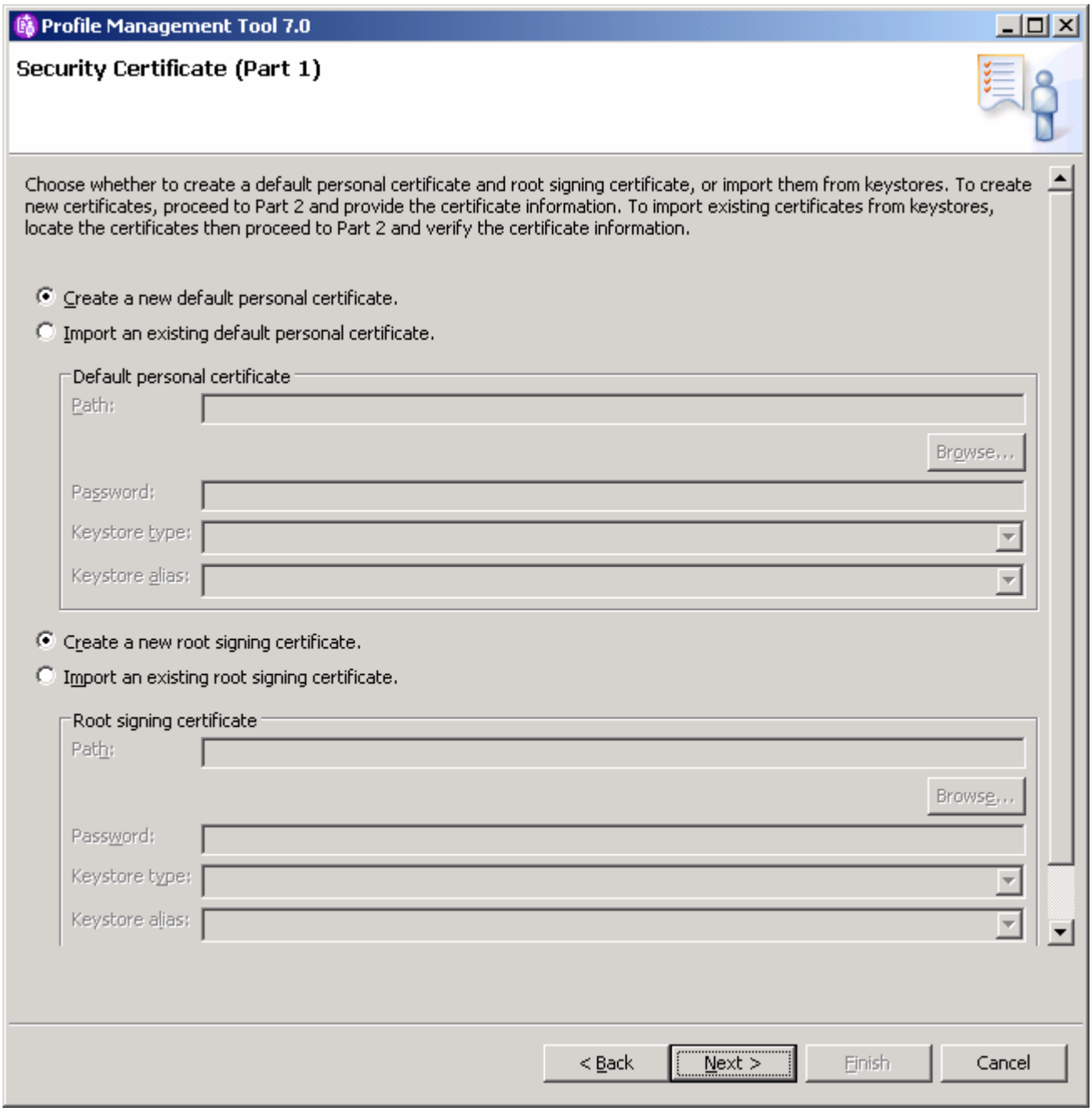
__ i. Accept the defaults for the **Node name**, **Host name** and **Cell name** and click **Next**. Note that the defaults on your system will differ from those pictured below.



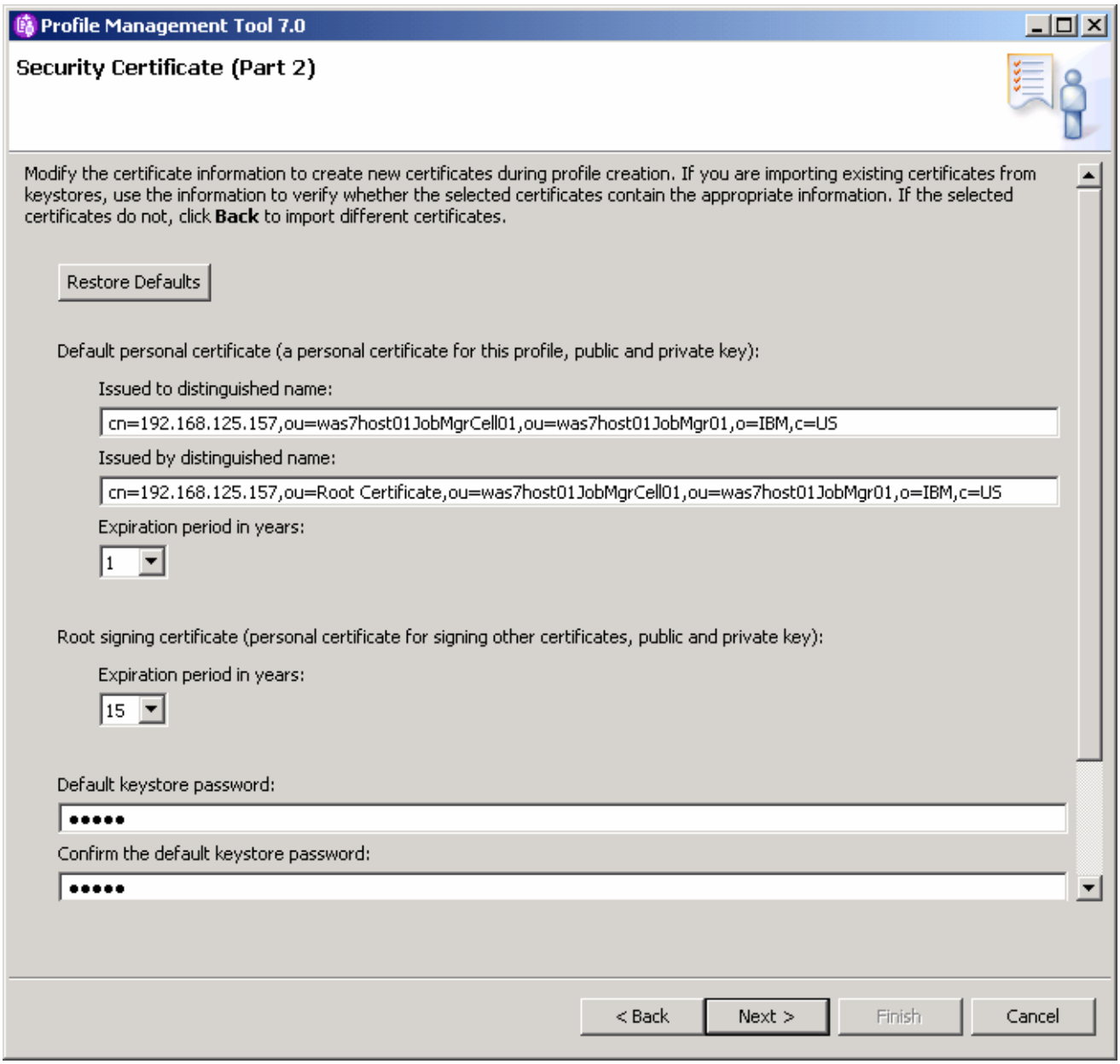
__ j. **Enable administrative security** by entering in **wsdemo** for the **User name** as well as the **passwords** and then click **Next**.



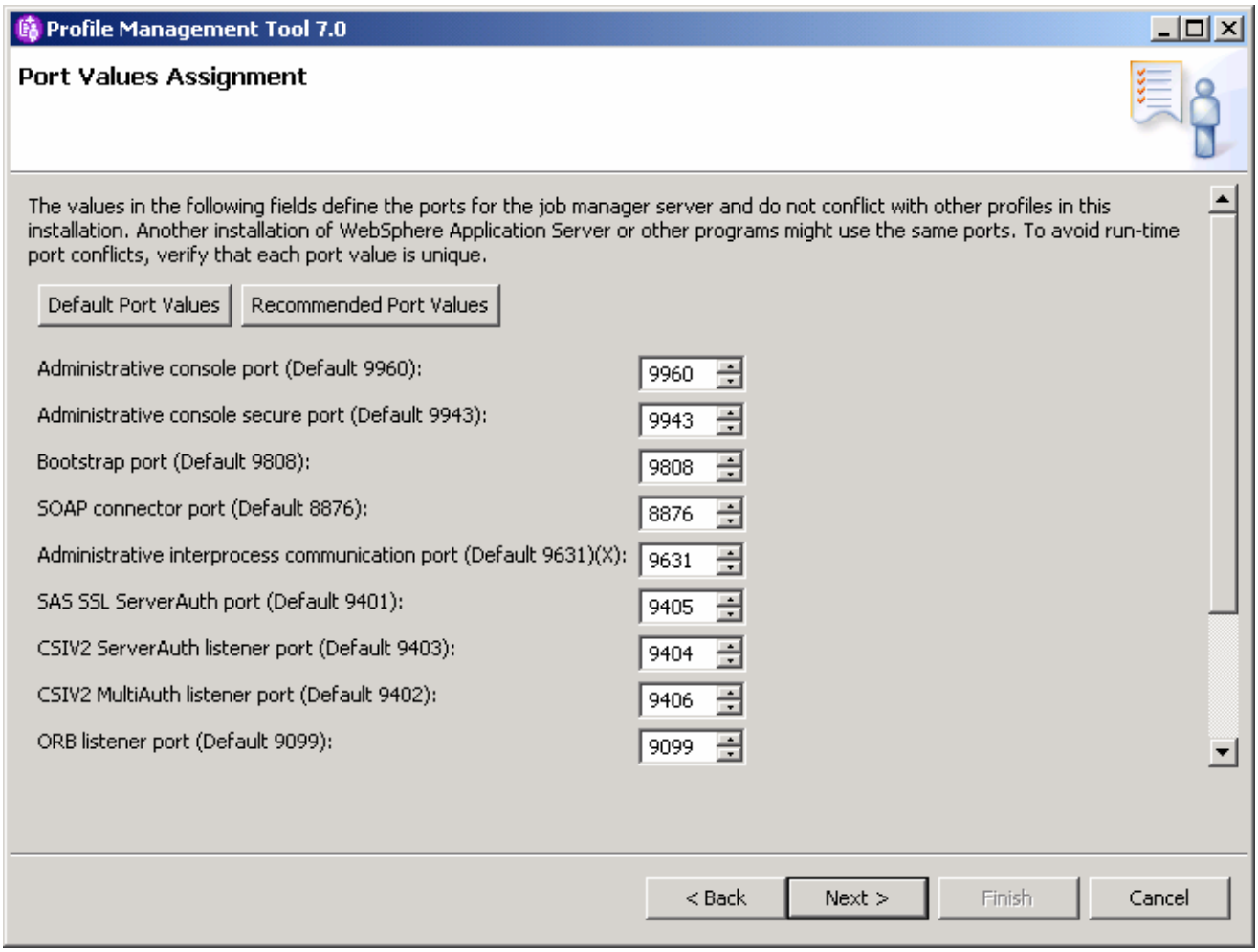
__ k. Accept the defaults for the **security certificates** and click **Next.**



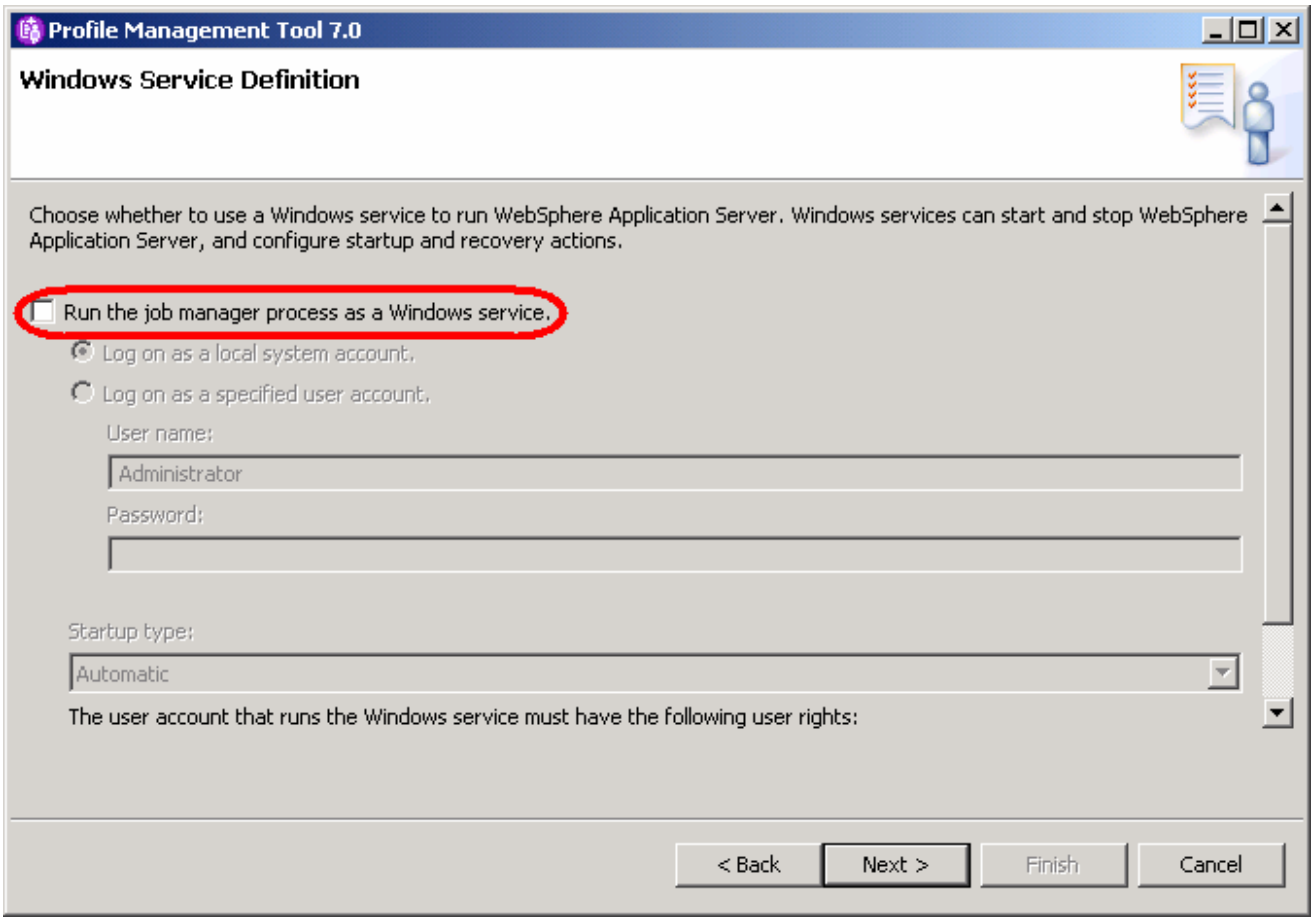
__ l. Accept the defaults for the **personal certificates** and click **Next.**



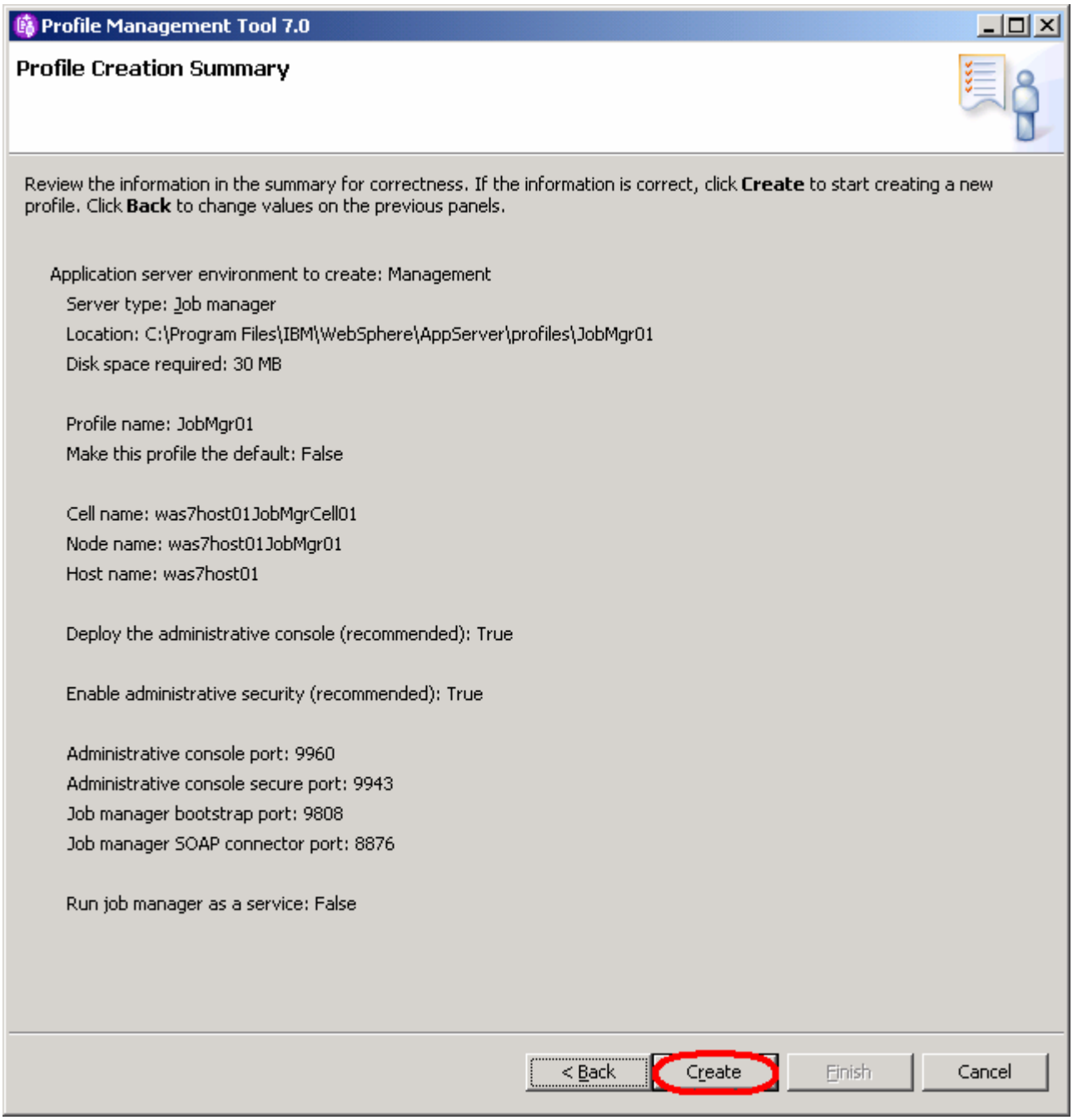
__ m. Accept the defaults for the **Port values** and click **Next**.



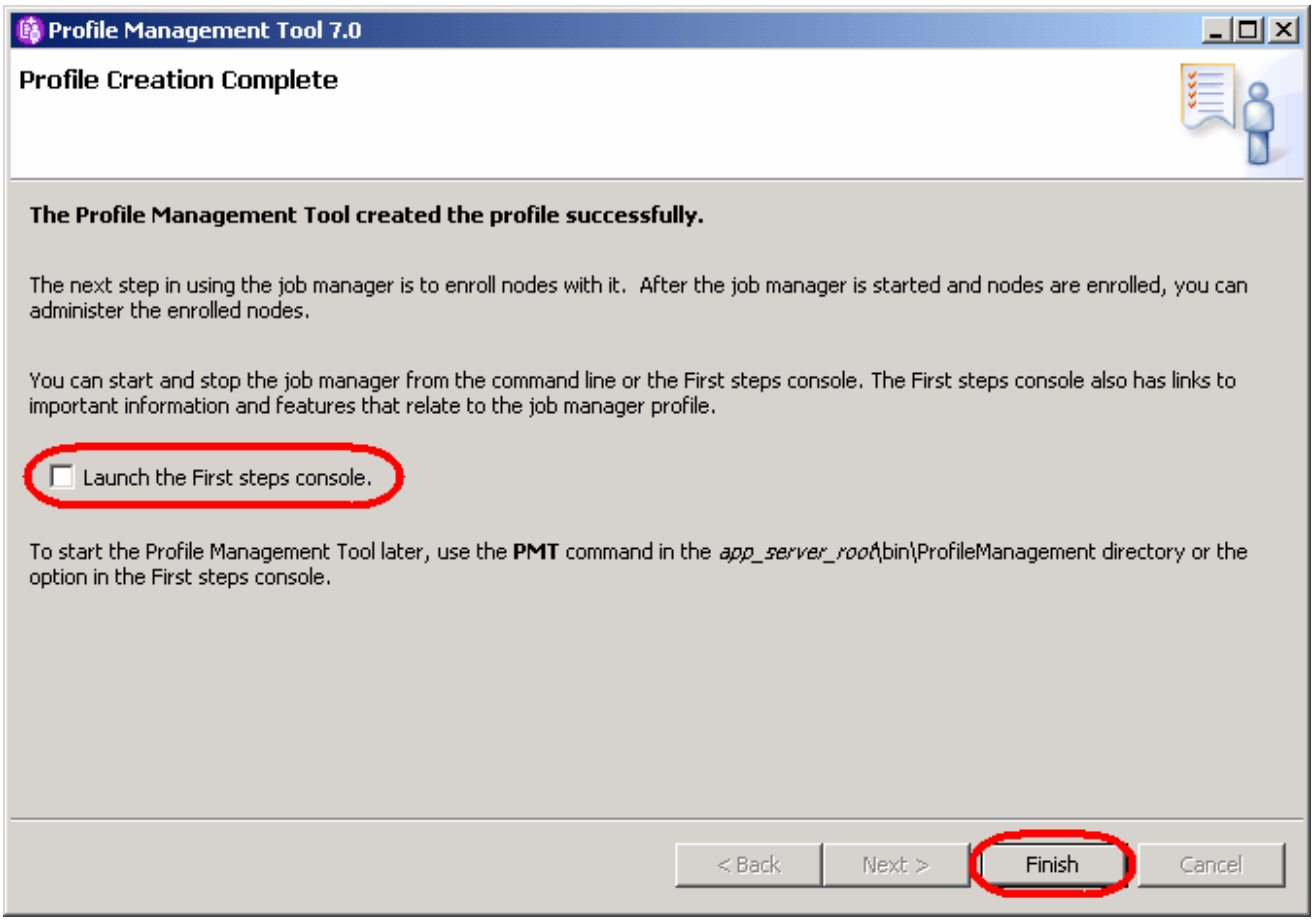
__ n. **Uncheck** the **Run the job manager process as a Windows service** and click **Next**.



__ o. Click **Create** on the Summary screen.

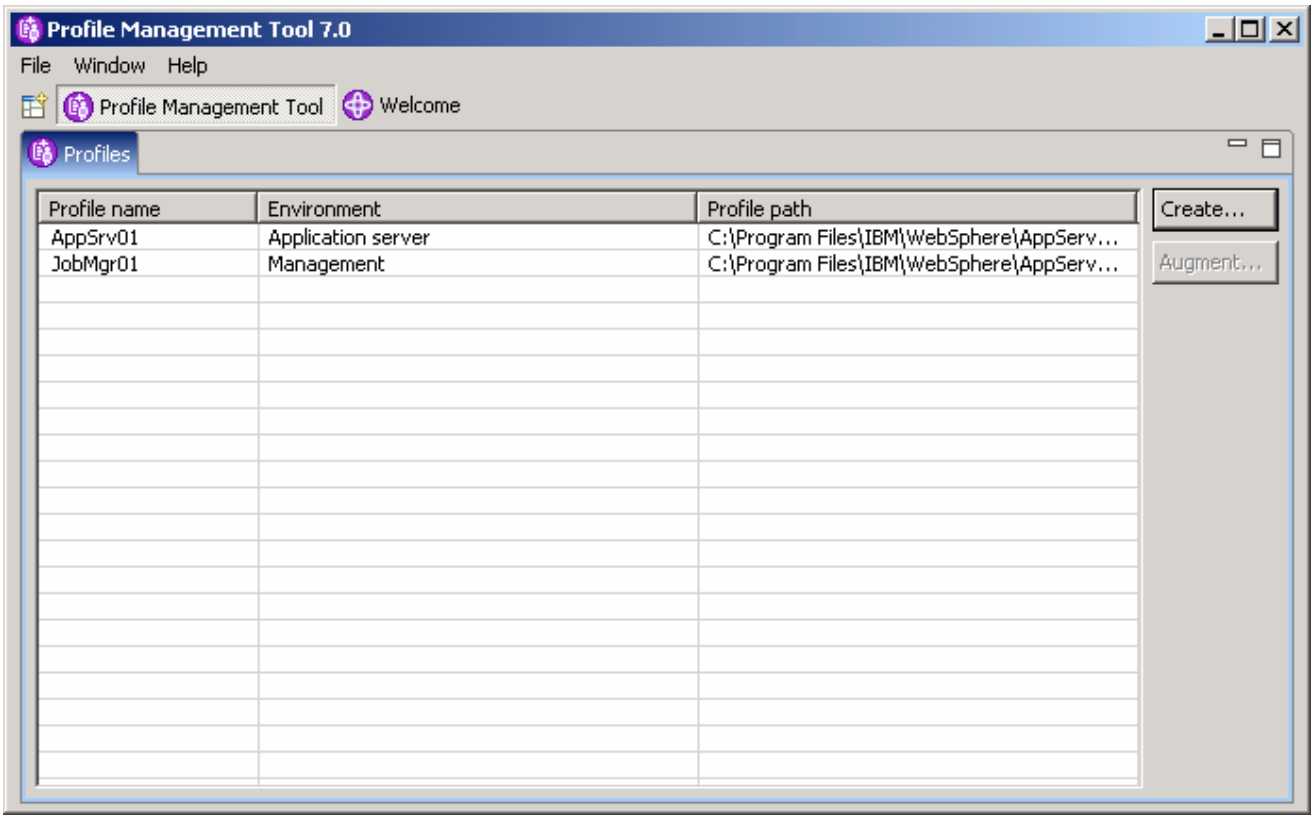


__ p. **Uncheck** the **Launch the First steps console** and click **Finish**.



____ 2. Verify that the Job manager profile now appears in the list of profiles.

__ a. Leave the Profile Management Tool running as it will be used in the next Step.

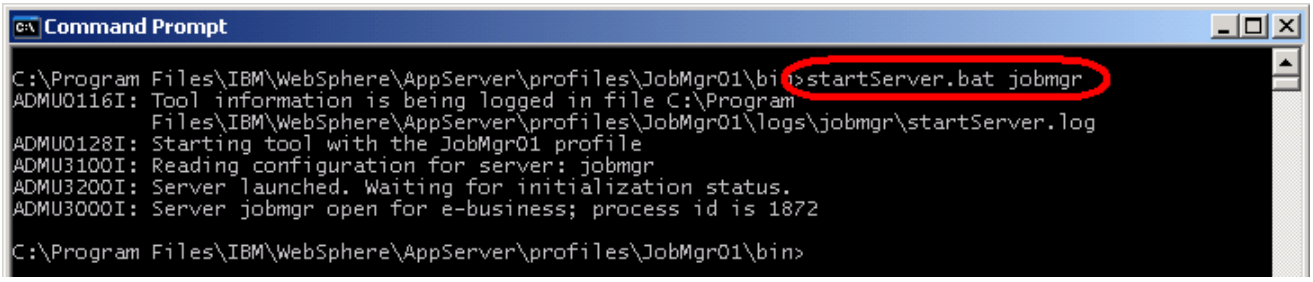


____ 3. Start the job manager.

__ a. To start the job manager, from a command prompt, enter the following commands:

```
cd %WAS_HOME%\profiles\JobMgr01\bin

startServer.bat jobmgr
```



Part 2: Create an administrative agent profile

Another key administrative process is called the **Administrative agent**. This process is independent of the deployment manager. Stand-alone nodes can make themselves known to the administrative agent through a registration process. Once registered, the administrative agent can poll the job manager to look for jobs to be run at this node.

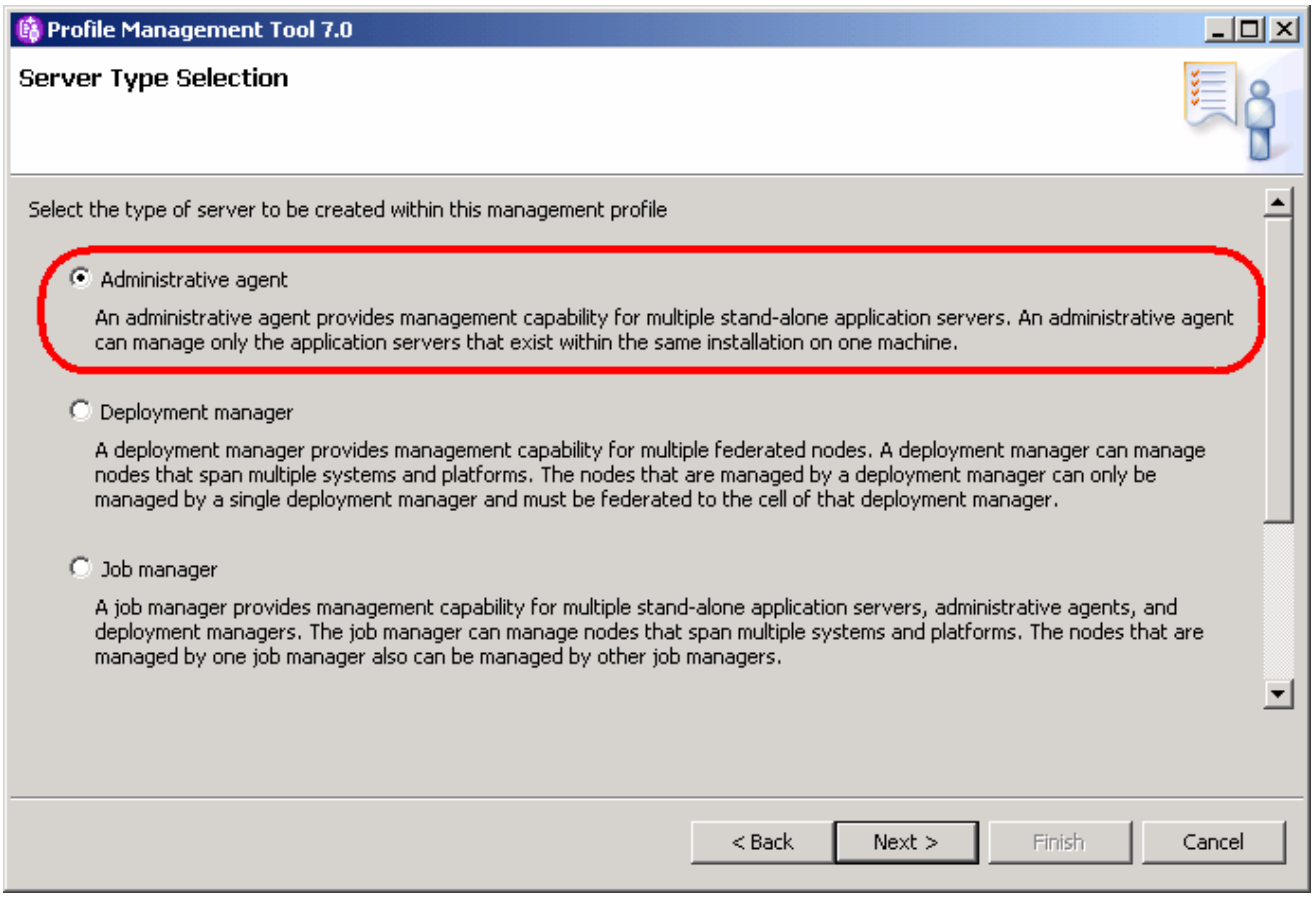
Creating the administrative agent profile is nearly identical to creating the job manager profile. The only difference is in selecting the server type.

____ 4. Create the Administrative agent profile.

__ a. Click **Create** in the Profile Management Tool.

__ b. Select **Management** for the environment type and click **Next**.

__ c. Select **Administrative agent** for the server type and click **Next**.



__ d. Choose **Advance profile creation** for the options screen and click **Next**.

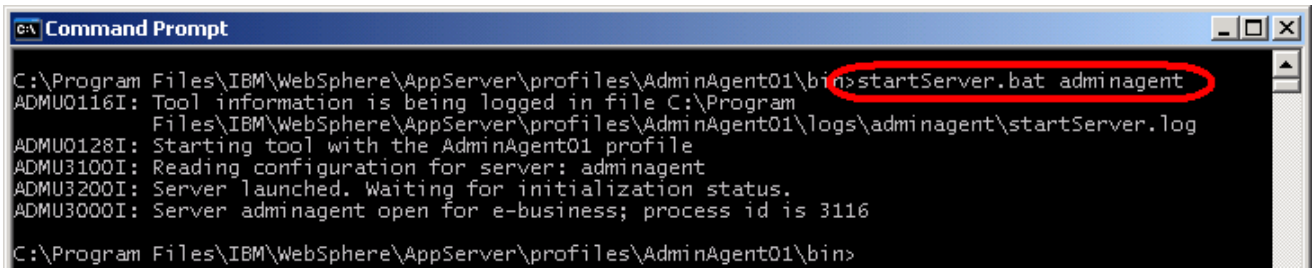
__ e. **Continue through the wizard using the same choices used in the previous section** when creating the Job manager. Make sure to use the defaults for the profile name and directory. Also, make sure to use **wsdemo** for the administrative security user name as well as password.

____ 5. Start the administrative agent.

__ a. To start the administrative agent, from a command prompt, enter the following commands:

```
cd %WAS_HOME%\profiles\ AdminAgent01\bin

startServer.bat adminagent
```



Part 3: Create an additional application server profile

Although an application server profile may already exist on your system, associating an application server with an administrative agent alters the application server's behavior. So, for the sake of this exercise, a new application server profile will be used.

Create a new application server profile called AppSrv02.

____ 1. Create the **Application server** profile. These steps will be pretty much exactly the same as was done in one of the previous labs.

__ a. Click **Create** in the Profile Management Tool.

__ b. Select **Application server** for the type and click **Next**.

__ c. Select **Advanced profile creation** and click **Next**.

__ d. For the optional applications, accept the **defaults** and click **Next**.

__ e. Accept the **default**s for the **Profile name and directory**. The name should be **AppSrv02**. If the name differs, note that for the next part of the lab. Click **Next**.

__ f. Accept the **defaults** for the **Node name**, **Server name** and **Host name**. Write down the node name that is used here, as it will be used in the next part of the exercise. Click **Next**.

__ g. Use **wsdemo** for the **administrative security User name** and **Password**. Click **Next**.

__ h. Accept the defaults on both of the **Security Certificate** windows and click **Next.**

__ i. Accept the defaults for the selected **Ports Values** and click **Next**.

__ j. **Uncheck** the Run **the application server process as a Windows service** and click **Next**.

__ k. **Uncheck** the option for **Create a Web server definition**, click **Next**.

__ l. Click **Create** on the **Summary** page.

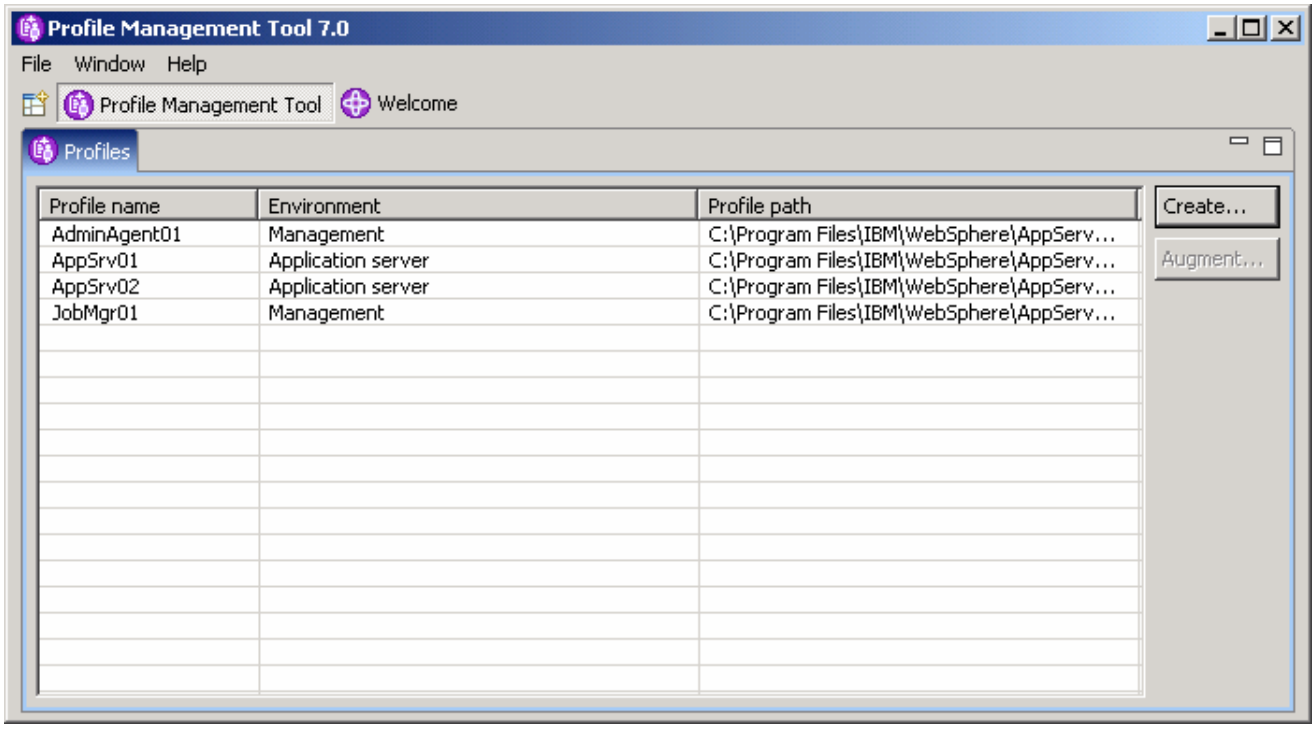
____ 2. Once the profile creation has completed, run the installation verification.

__ a. On the completion screen of the profile creation, leave the **Launch the First steps console** checked and click **Finish**.

__ b. In the **First steps console**, click **Installation verification**. This will not only verify that the profile was created correctly, but it will also cause the application server to be started.

__ c. Verify that the installation verification completed correctly. **Close** the **installation verification** window and click **Exit** in the **First steps console**.

____ 3. At this point, verify that all three of the new profiles have been created (other profiles may appear as well, as shown below.)



____ 4. **Exit** the **Profile Management Tool**.

Part 4: Register the stand-alone application server with the job manager and administrative agent

Now that the job manager and administrative agent have been created and started, it is time for the stand-alone application server to be registered with them. This process will be done through the creation and use of several scripts. The first script will hold useful variable definitions. The next two scripts will both use that setup script and then register the application server with the appropriate service.

____ 1. First, create a new **setEnvVars.bat**.

__ a. Copy **setEnvVars.bat** from **<LABFILES>\FlexibleMgmtLab** to the **<WAS_HOME>\bin** directory.

__ **b.** Using a text editor, **open <WAS_HOME>\bin\setEnvVars.bat**

__ **c.** Make any modification necessary to match the lab environment. The entries are likely to already be appropriate, but should be validated. See the table below for explanation. If there are additional entries in the file you downloaded, you can safely ignore them.

```
echo on
set WAS_HOME=C:\Program Files\IBM\WebSphere\AppServer\
set appAdminUser=wsdemo
set appAdminPassword=wsdemo
set jobManagerAdminUser=wsdemo
set jobManagerAdminPassword=wsdemo
set adminAgentAdminUser=wsdemo
set adminAgentAdminPassword=wsdemo
set jobMgrProfileName=JobMgr01
set jobMgrHostName=localhost
set jobMgrSoapPort=8876
set jobMgrAdminSecurePort=9943
set adminAgentProfileName=AdminAgent01
set adminAgentHostName=localhost
set adminAgentSoapPort=8877
set baseProfileName=AppSrv02
set baseNodeName= was7host01Node02
echo off
```

Variable	Values and notes
WAS_HOME	**"C:\Program Files\IBM\WebSphere\AppServer"** Note: This is the default location.
appAdminUser appAdminPassword jobManagerAdminUser jobManagerAdminPassword adminAgentAdminUser adminAgentAdminPassword	**wsdemo** Note: This was set during the profile creation.
jobMgrProfileName	**JobMgr01** Note: This is the default value for the first job manager created.
jobMgrHostName	**localhost** Note: Host name or host address for the machine where the profile was created. Since the job manager is local, **localhost** should suffice.
jobMgrSoapPort	**8876** Note: This is the default but can be verified by checking the port value for the **SOAP_CONNECTOR_ADDRESS** in the file: $WAS_HOME/profiles/<job mgr profile name>/config/cells/<job mgr cell name>/nodes/<job mgr node name>/serverindex.xml
jobMgrAdminSecurePort	**9943** Note: This is the default but can be verified by checking the port value for the **WC_adminhost_secure** in the file: $WAS_HOME/profiles/<job mgr profile name>/config/cells/<job mgr cell name>/nodes/<job mgr node name>/serverindex.xml
adminAgentProfileName	**AdminAgent01** Note: This is the default value for the first administrative agent created.
adminAgentHostName	**localhost** Note: Host name or host address for the machine where the profile was created. Since the administrative agent is local, **localhost** should suffice.
adminAgentSoapPort	**8877** Note: This is the default but can be verified by checking the port value for the **SOAP_CONNECTOR_ADDRESS** in the file: $WAS_HOME/profiles/<administrative agent profile name>/config/cells/<administrative agent cell name>/nodes/<administrative agentnode name>/serverindex.xml

Variable	Values and notes
baseProfileName	**AppSrv02** Note: This is the name of the application server profile that was created in a previous lab. The default value for the first stand-alone application server is AppSrv01.
baseNodeName	**was7host01Node02** Note: Initially, any value can be used. After the stand-alone application server profile is registered with the administrative agent, the value can be found by looking in the directory: $WAS_HOME/profiles/<administrative agent profile name>/config/cells/<administrative agent cell name>/managednodes/

__ d. After making any change, save the file and exit.

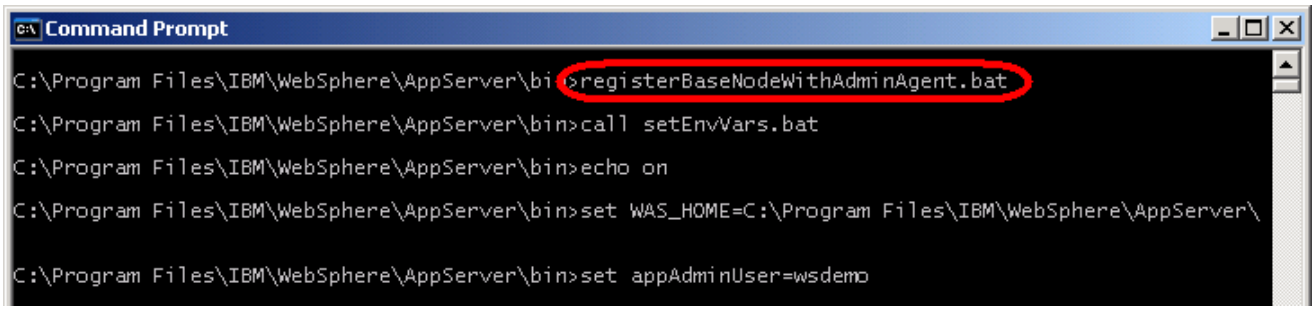
____ 2. Register the stand-alone application server with the administrative agent.

__ a. Copy **registerBaseNodeWithAdminAgent.bat** from **<LABFILES>\FlexibleMgmtLab** to the **<WAS_HOME>\bin** directory. This file looks like this:

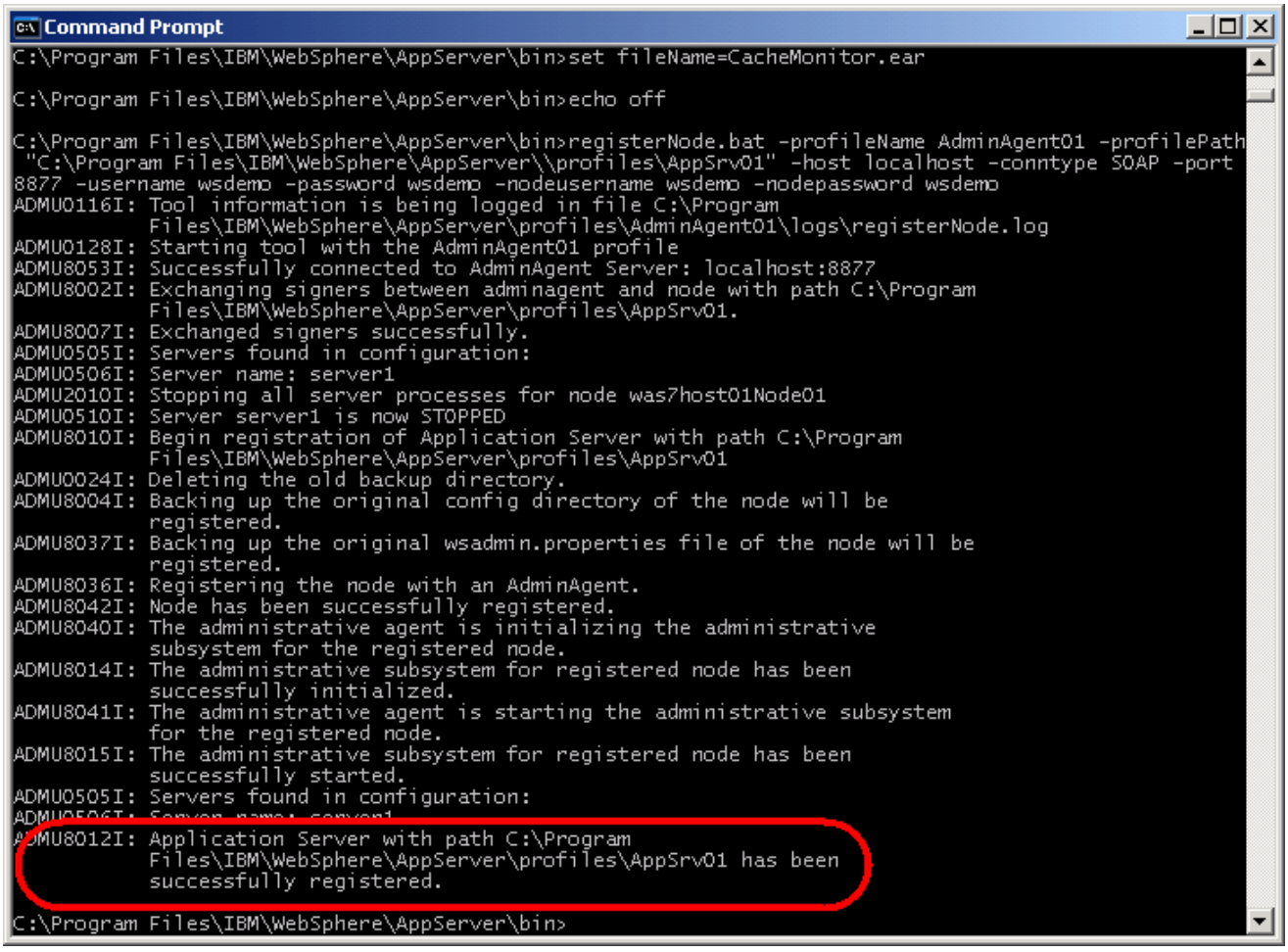
```
call setEnvVars.bat
cd %WAS_HOME%\bin
echo on

registerNode.bat -profileName %adminAgentProfileName% -profilePath
"%WAS_HOME%\profiles\%baseProfileName%" -host %adminAgentHostName%
-conntype SOAP -port %adminAgentSoapPort% -username
%adminAgentAdminUser% -password %adminAgentAdminPassword% -nodeusername
%appAdminUser% -nodepassword %appAdminPassword%
```

__ **b.** From a command line, change directory to **<WAS_HOME>\bin** and start the **registerBaseNodeWithAdminAgent.bat** script. This will register the application server with the administrative agent.



__ c. This should run for a little time but should complete without error.



____ 3. Next the stand-alone application server needs to be registered with the job manager.

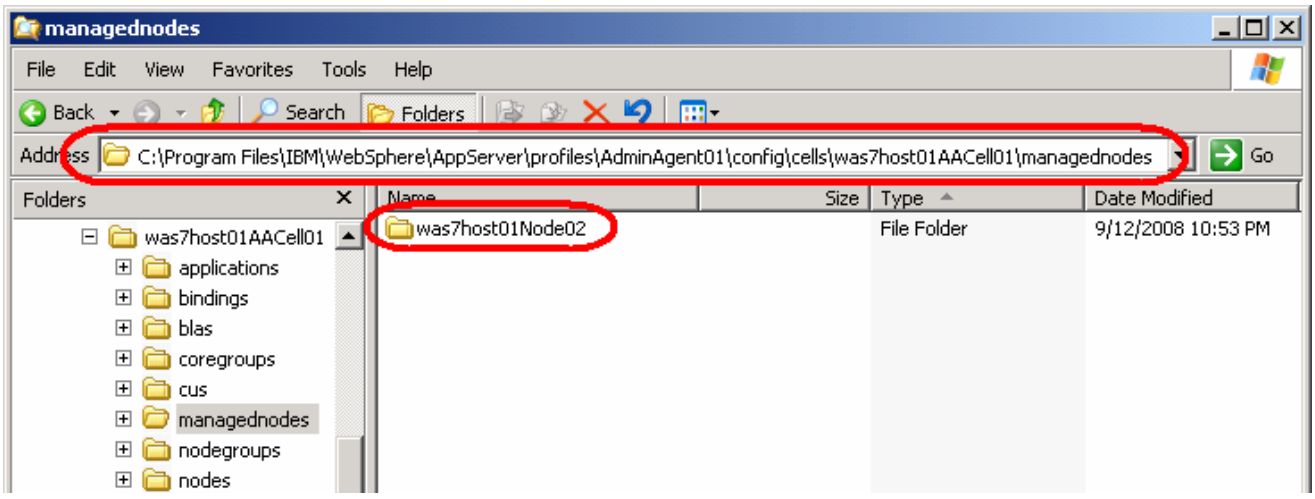
__ a. Copy **registerBaseNodeWithJobMgr.bat** from **<LABFILES>\FlexibleMgmtLab** to the **<WAS_HOME>\bin** directory. This file looks like this:

```
@REM register base node with job manager
call setEnvVars.bat
echo on
cd "%WAS_HOME%\bin"
call wsadmin.bat -username %adminAgentAdminUser% -password
%adminAgentAdminPassword% -profileName %adminAgentProfileName% -lang
jython –f registerBaseNodeWithJobMgr.py %jobMgrHostName%
%jobMgrAdminSecurePort% %baseNodeName% % jobManagerAdminUser%
%jobManagerAdminPassword%
echo off
```

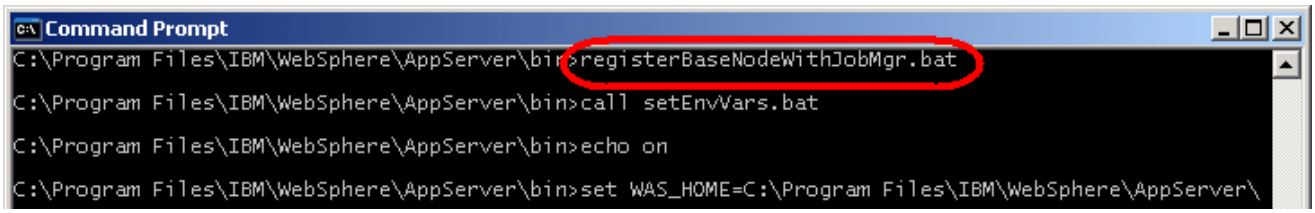
__ b. Also copy **registerBaseNodeWithJobMgr.py** from **<LABFILES>\FlexibleMgmtLab** to the **<WAS_HOME>\bin** directory. This file looks like this:

```
import sys
AdminTask.registerWithJobManager('[-host %s -port %s –managedNodeName
%s -user %s -password %s]' %(sys.argv[0],  sys.argv[1], sys.argv[2],
sys.argv[3], sys.argv[4]))
```

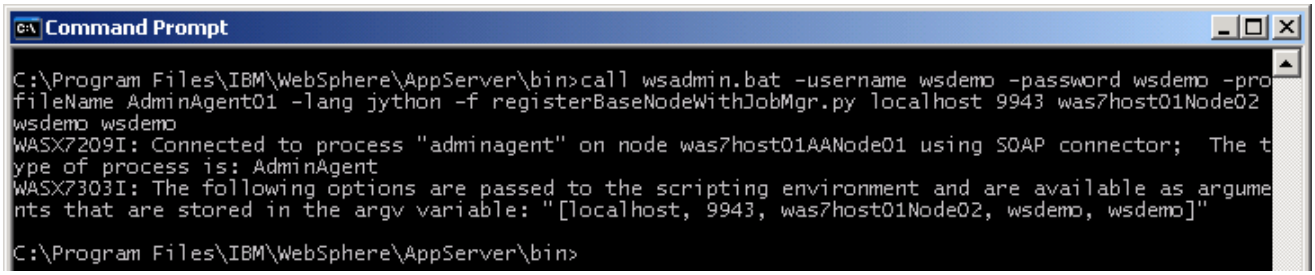
__ c. Verify that the **baseNodeName** entry in the **setEnvVars.bat** file is correct. The value should match the directory name in **<WAS_HOME>/profiles/<administrative agent profile name>/config/cells/<administrative agent cell name>/managednodes/**. If the values do not match, update the entry in **<WAS_HOME>\bin\setEnvVars.bat**.



__ d. From a command line, change directory to **<WAS_HOME>\bin** and start the **registerBaseNodeWithJobMgr.bat** script. This will register the application server with the job manager.



__ e. This command may take a minute but should return with no errors.



Part 5: Use the job manager to start a server

Now that the flexible management environment has been set up, this part of the lab will use this infrastructure to demonstrate some of the functionality it provides. In this particular example, an application server will be started using the job manager's interface. The job manager will create a task, which the administrative agent will find and execute.

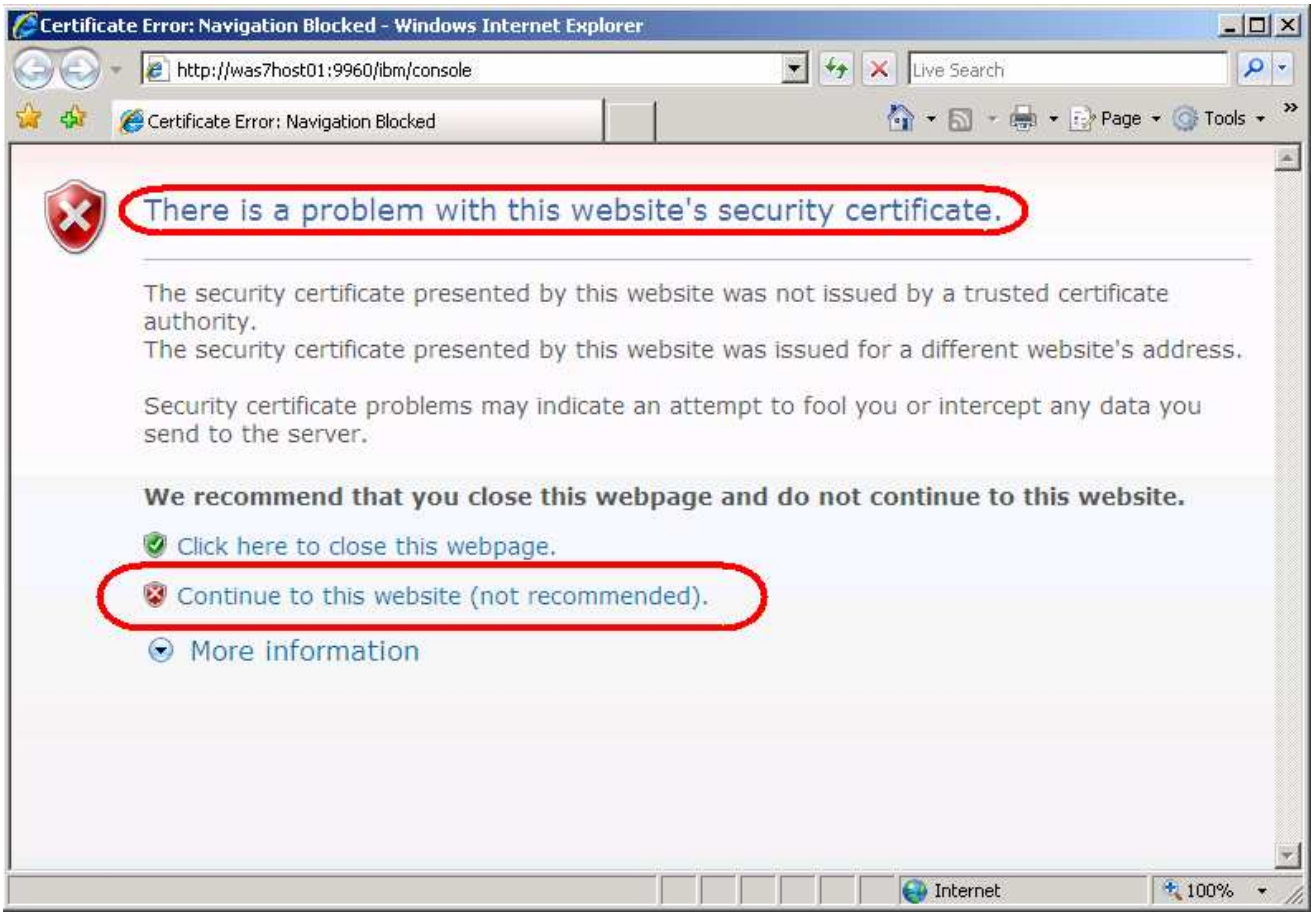
____ 1. Connect to the job manager console.

__ a. This can either be done several different ways, including:

1) In Windows, click Start -> Programs -> IBM WebSphere -> Application Server Network Deployment V7 -> **Profiles -> JobMgr01 -> Administrative console**.

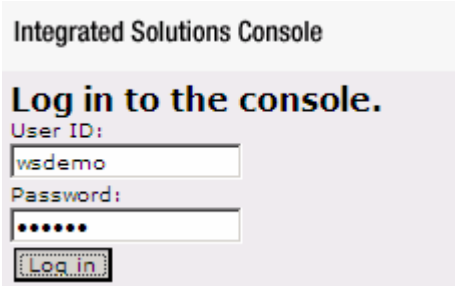
2) Open a browser and go to (substitute the correct port as needed):
http://localhost:9960/ibm/console

__ b. If you receive a warning regarding the security certificate, click Continue to this Web site. Note: different browsers will handle this issue in different ways. This screen capture is of Internet Explorer.

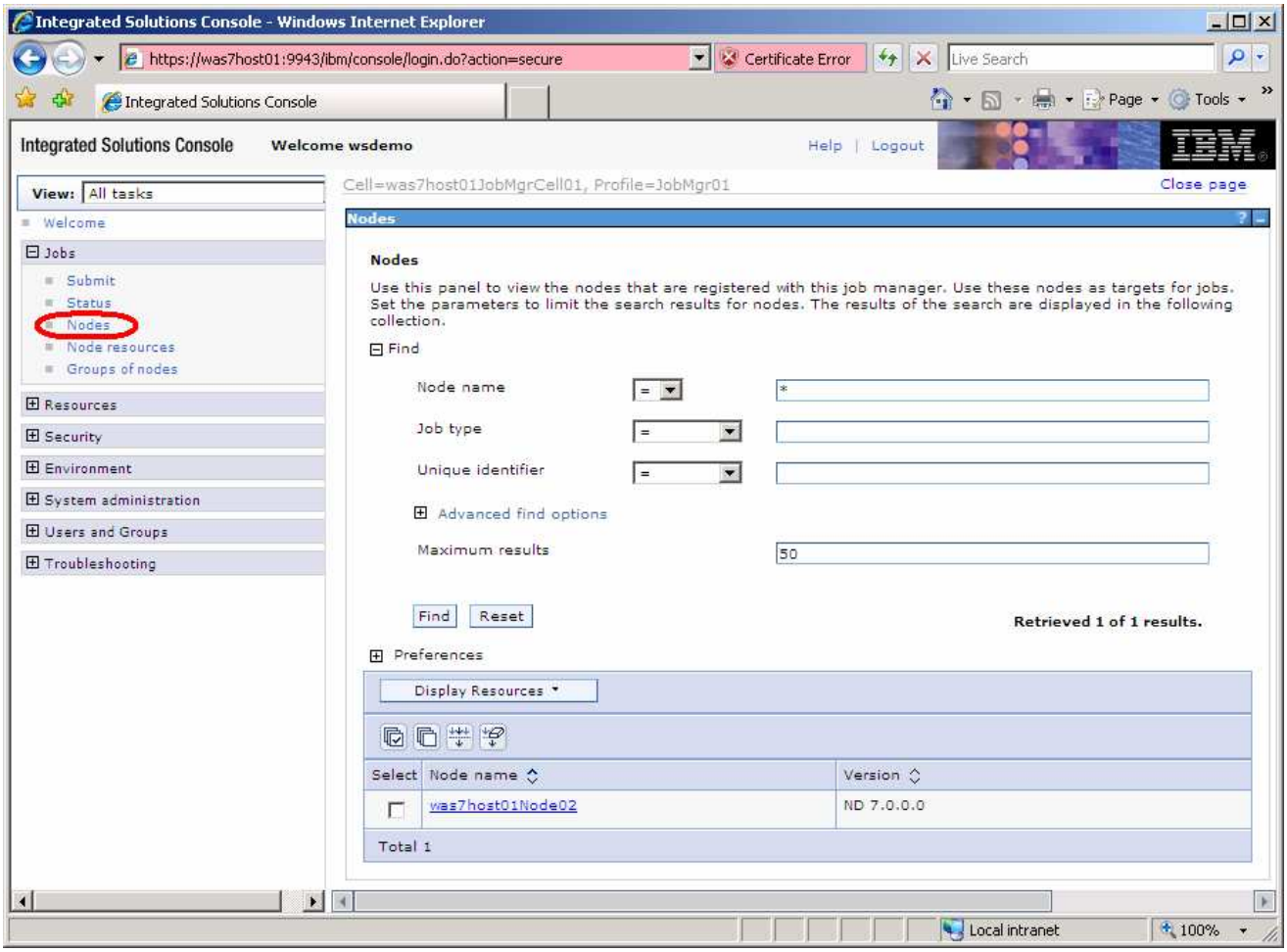


__ c. Notice that the URL that was entered was redirected to the following location https://localhost:9943/ibm/console/logon.jsp. This is due to the fact that administrative security was enabled at profile creation time.

__ d. At this point, the job manager will prompt for authentication. Use the **User ID** and **Password** that was entered during the job manager profile creation for administrative security. By default, this would have been **wsdemo** and **wsdemo**. Click **Log in**.



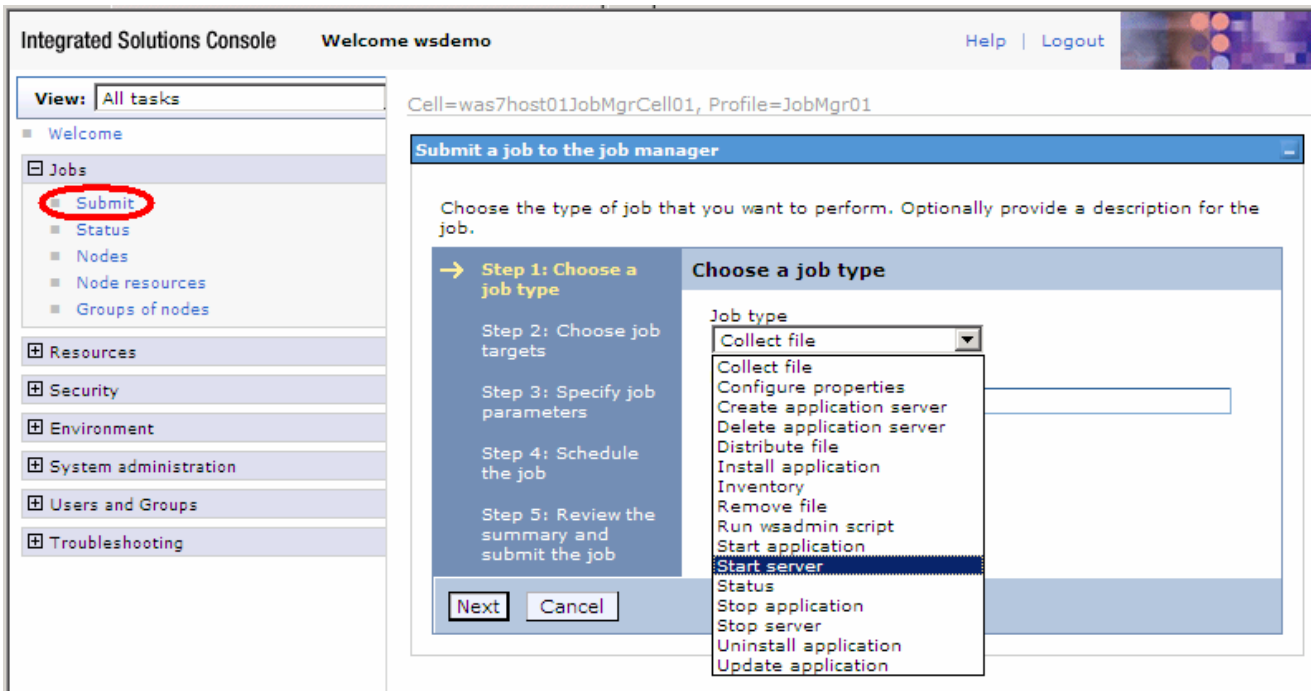
__ e. On the initial console screen, expand **Jobs** in the left navigation window and then click **Nodes**. Notice that the node that was defined in the previous part of the lab is there. It is therefore possible to assign tasks it.



____ 2. Submit a job for the application server.

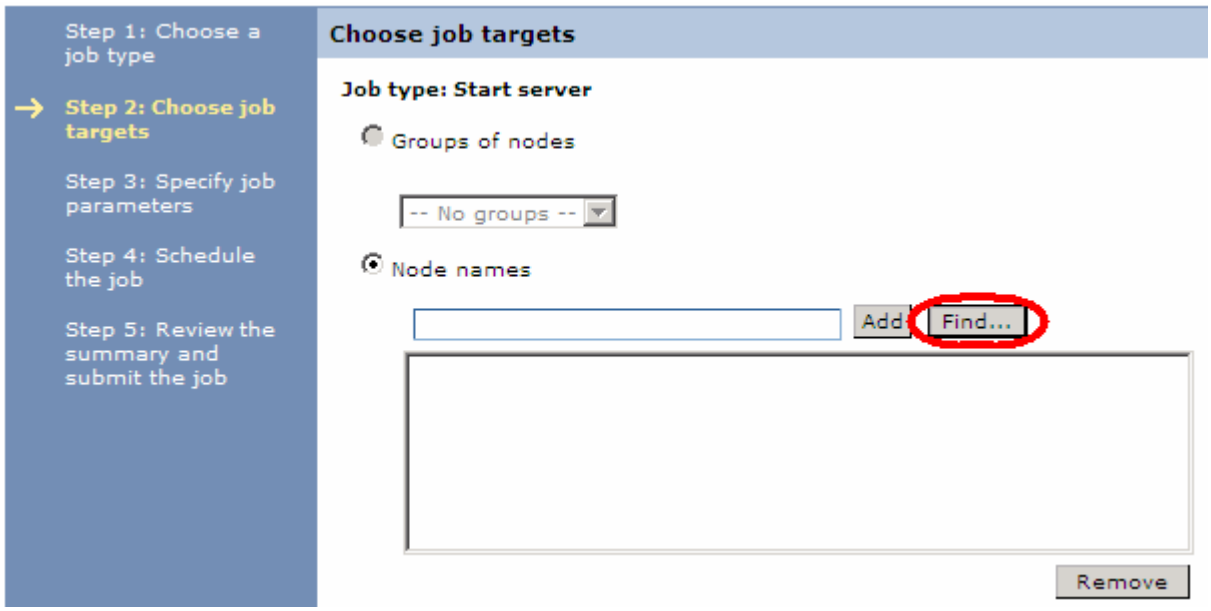
__ a. In the left navigation area, under **Jobs**, click **Submit**.

__ b. Under **the Job type** pull-down, select **Start server**.

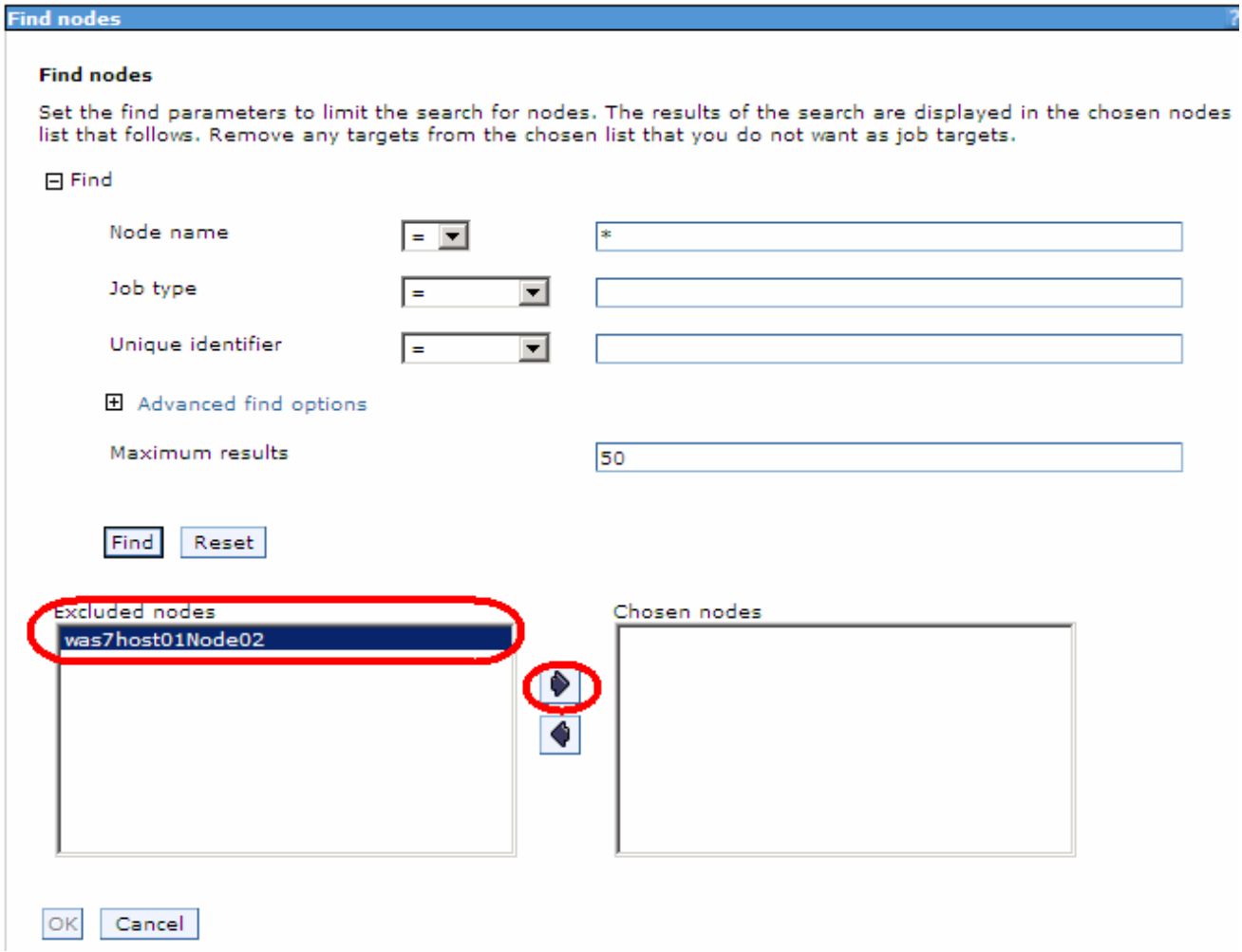


__ c. Click **Next**.

__ d. At this point, click Find. This will help identify the node on which the application server will be started (if the find button does not work, you may not be using a supported Web browser.)

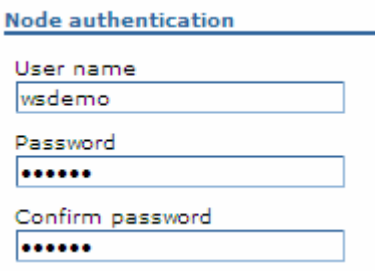


__ e. Notice that the node that will be used already appears in the Excluded notes list (if it does not, enter an **asterisk** in the **Node name** field and click **Find)**. Select the **Excluded node** and click the **right arrow** to move it to the **Chosen nodes** list.



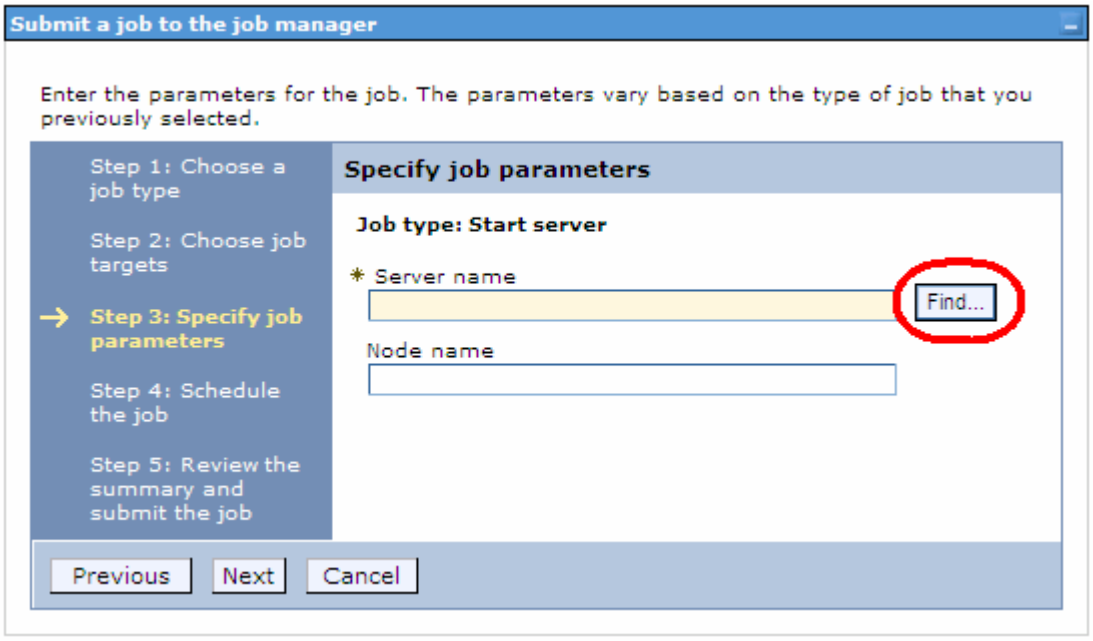
__ f. Click **OK**.

__ g. Enter the **User name** and **Password** for the application server (**Node authentication**). This should be what was used during the creation of the AppSrv02 profile (**wsdemo** and **wsdemo**).

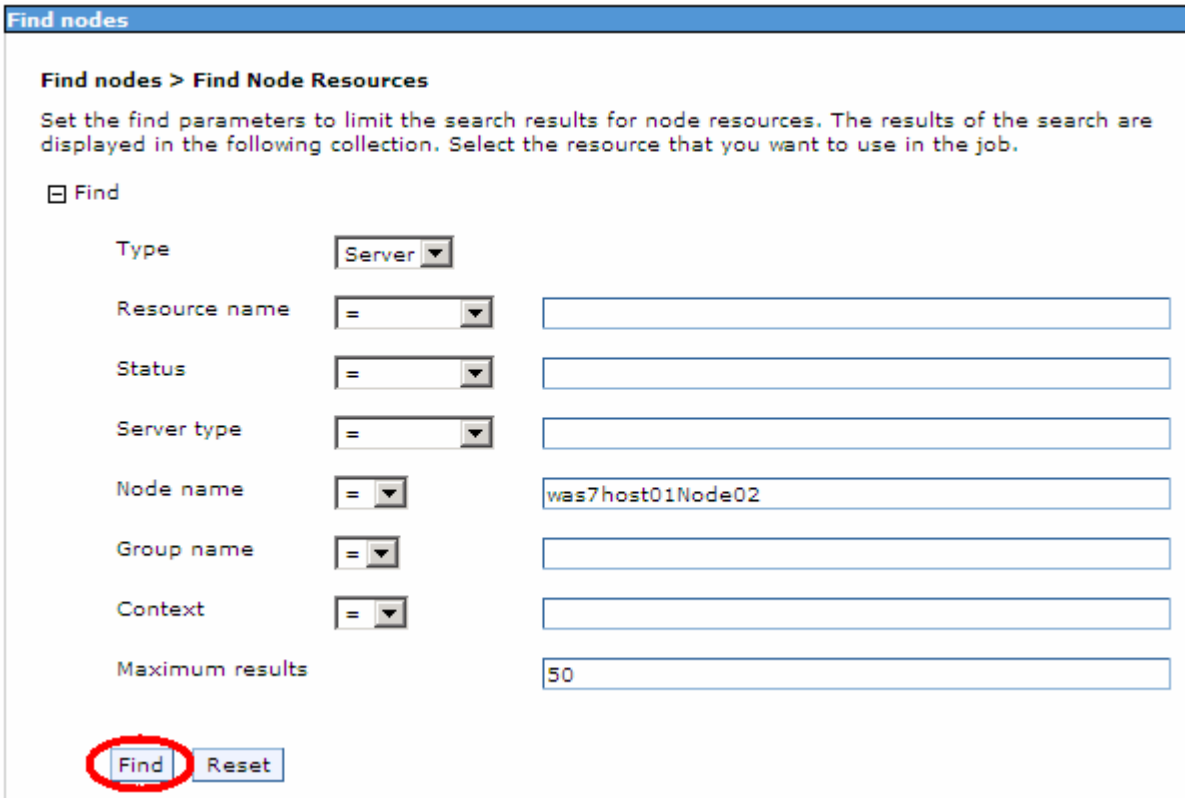


__ h. Click **Next**.

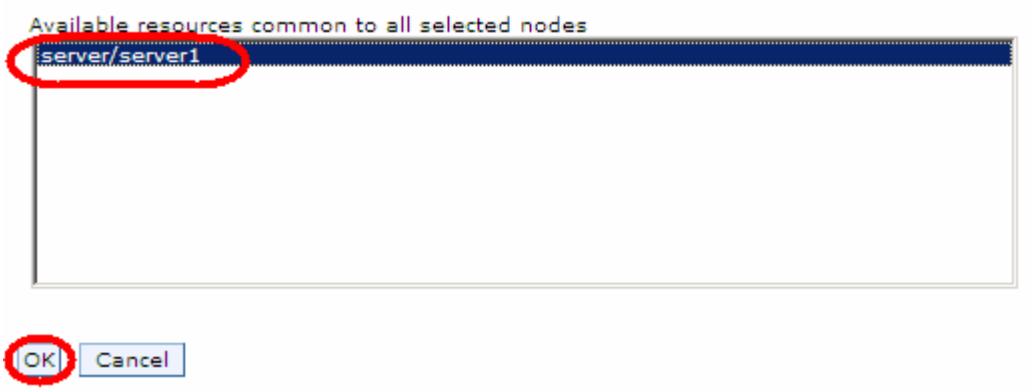
__ i. Click **Find** next to the **Server name** field. This will find the application server on the node that was identified in the previous steps.



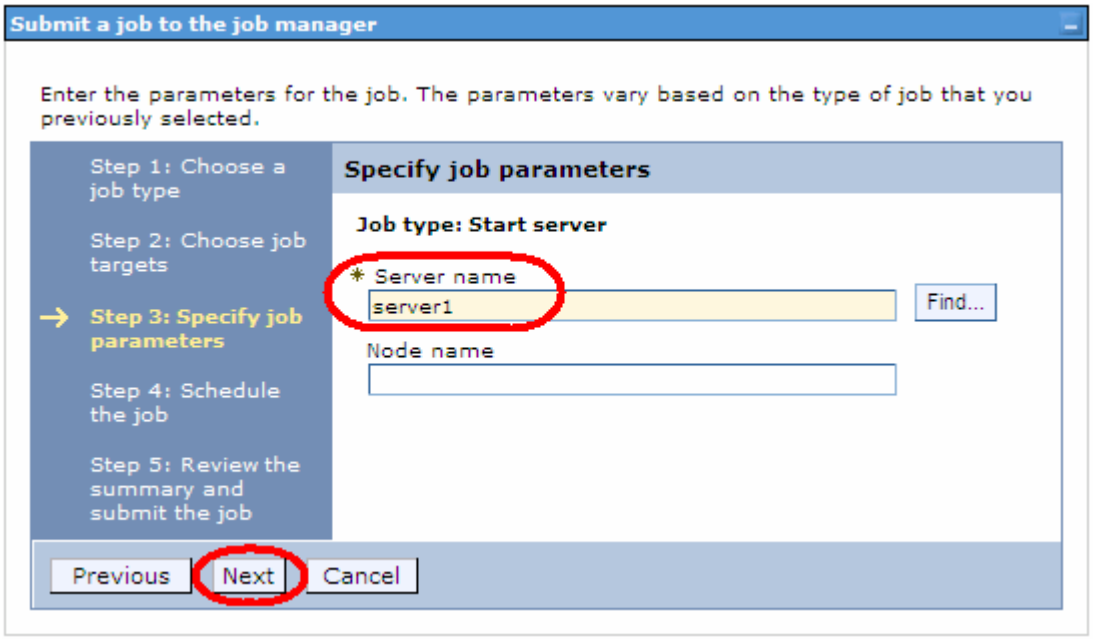
__ j. Click **Find** again on the **Find Node Resources** section, and that will display the possible matches. In the case the desired result is **server1**.



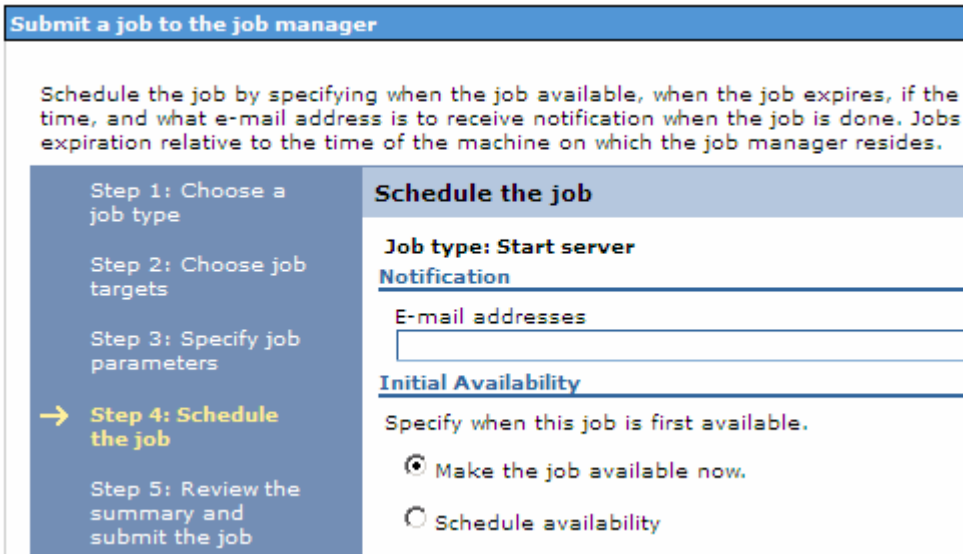
__ k. Select **server/server1** from the **Available resources common to all selected nodes** box and click **OK**.



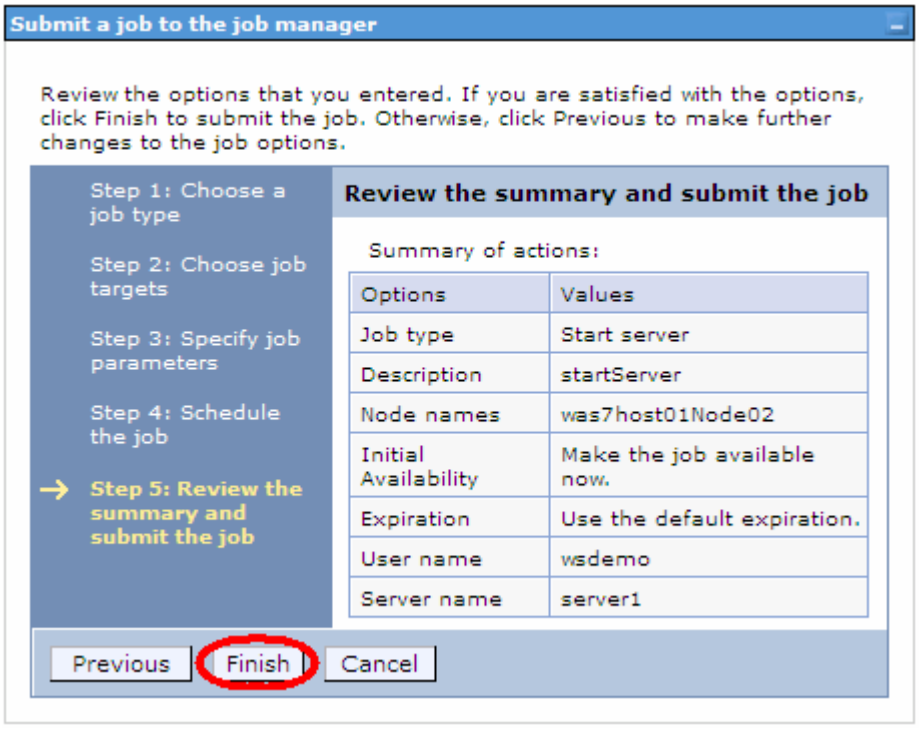
__ l. The wizard returns to the **Specify job parameters** screen with the **Server name** filled in. Click **Next**.



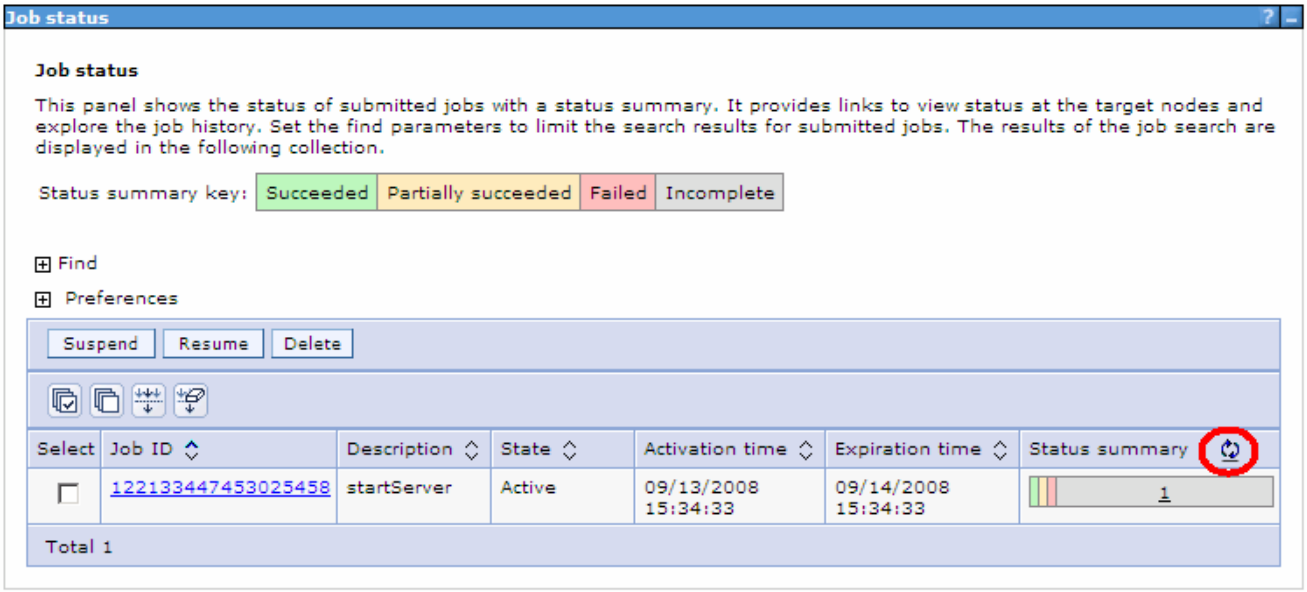
__ m. The next screen is used to **Schedule the job** and configure the **Notification** of event completion. Click **Next**.



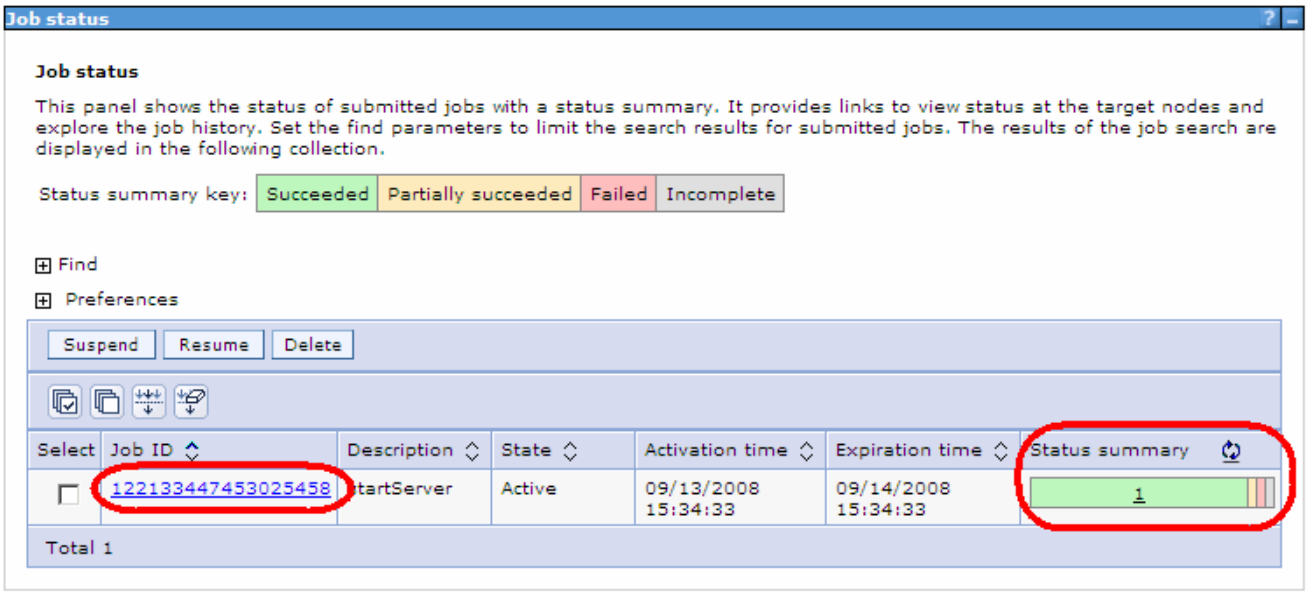
__ n. On the **summary** screen click **Finish**.



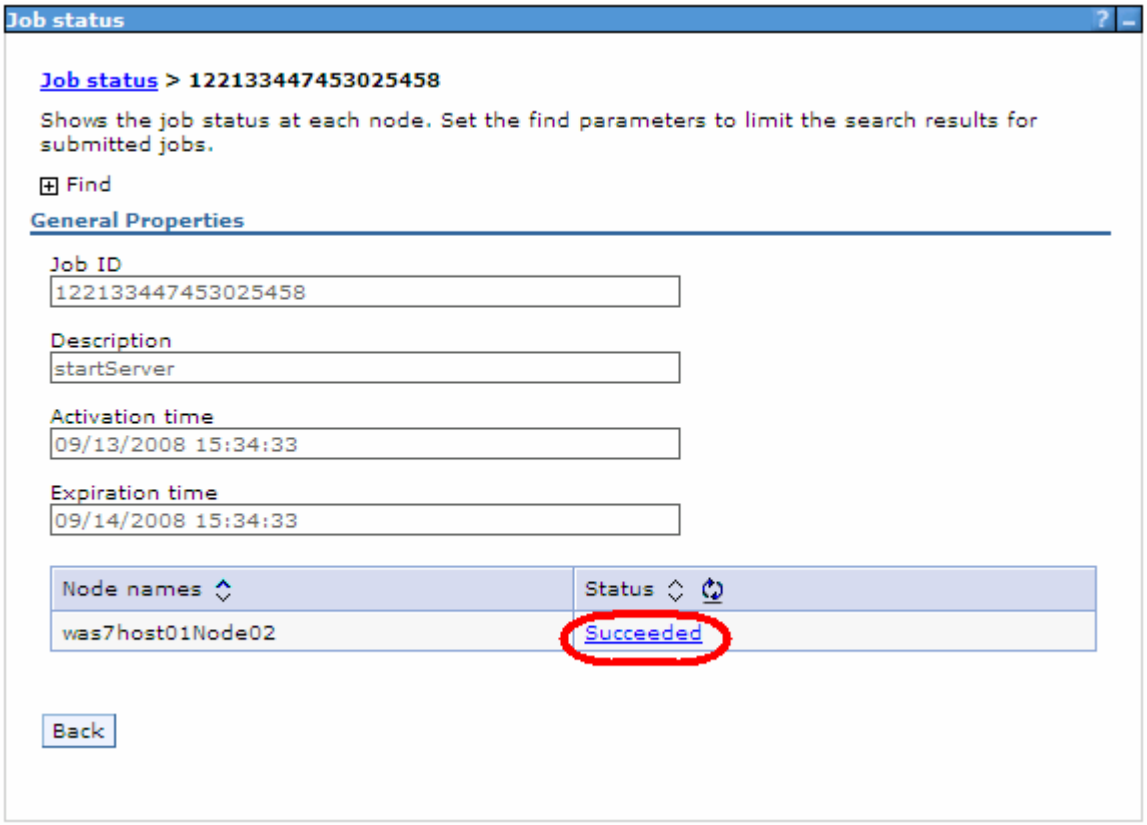
__ o. Since the job was scheduled to be available now, the console will go directly to the status page. Although in this case there is only one active job, there could potentially be many entries on this page. Click the **refresh** symbol to update the status.



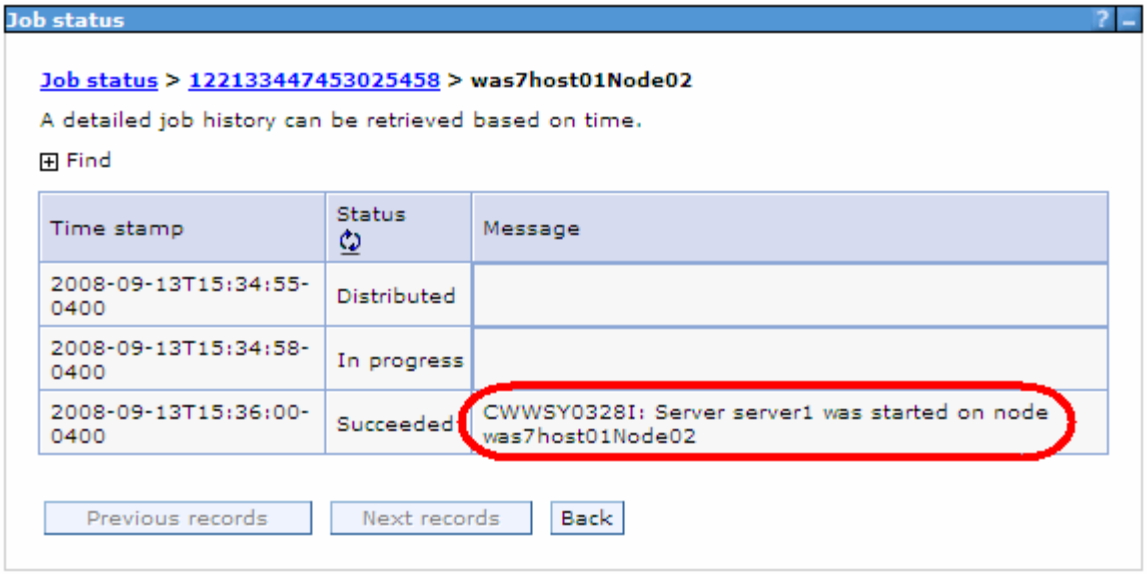
__ p. After a little bit of time, the status will change to look like the following:



__ q. Click the **Job ID** to see more information about the job.



__ r. For further status information, click **Succeeded**.



Part 6: Explore the Job Manager and Administrative Agent consoles

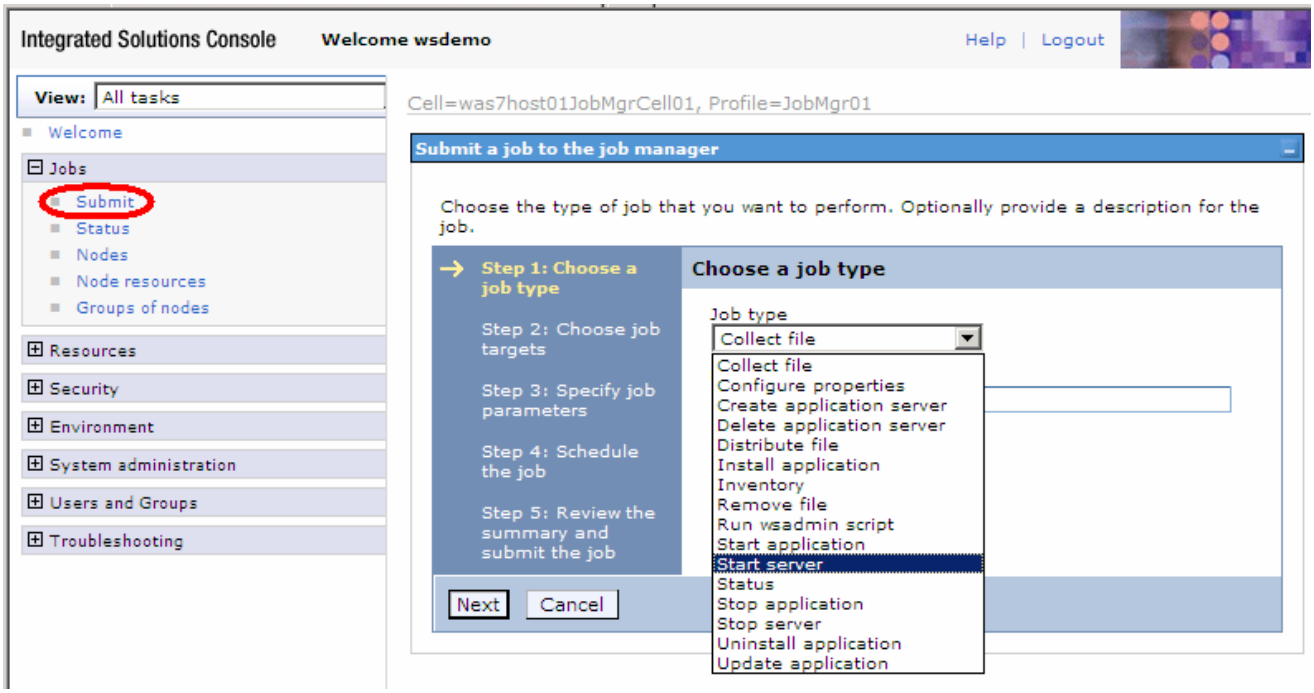
Now that the environment has been created and a job has been successfully run, it is a good time to take a look at the console interfaces for the processes involved. In this case, there are three processes that are involved. The first is the job manager and it is responsible for defining the jobs that will be run in the extended environment. The second is the actual application server itself. For the most part, it runs as it did before being made part of this extended environment (with some changes). Finally is the administrative agent. It has the job of polling the job manager for any jobs that might need to be run on the application servers for which it is responsible.

____ 1. Explore **the job manager console**.

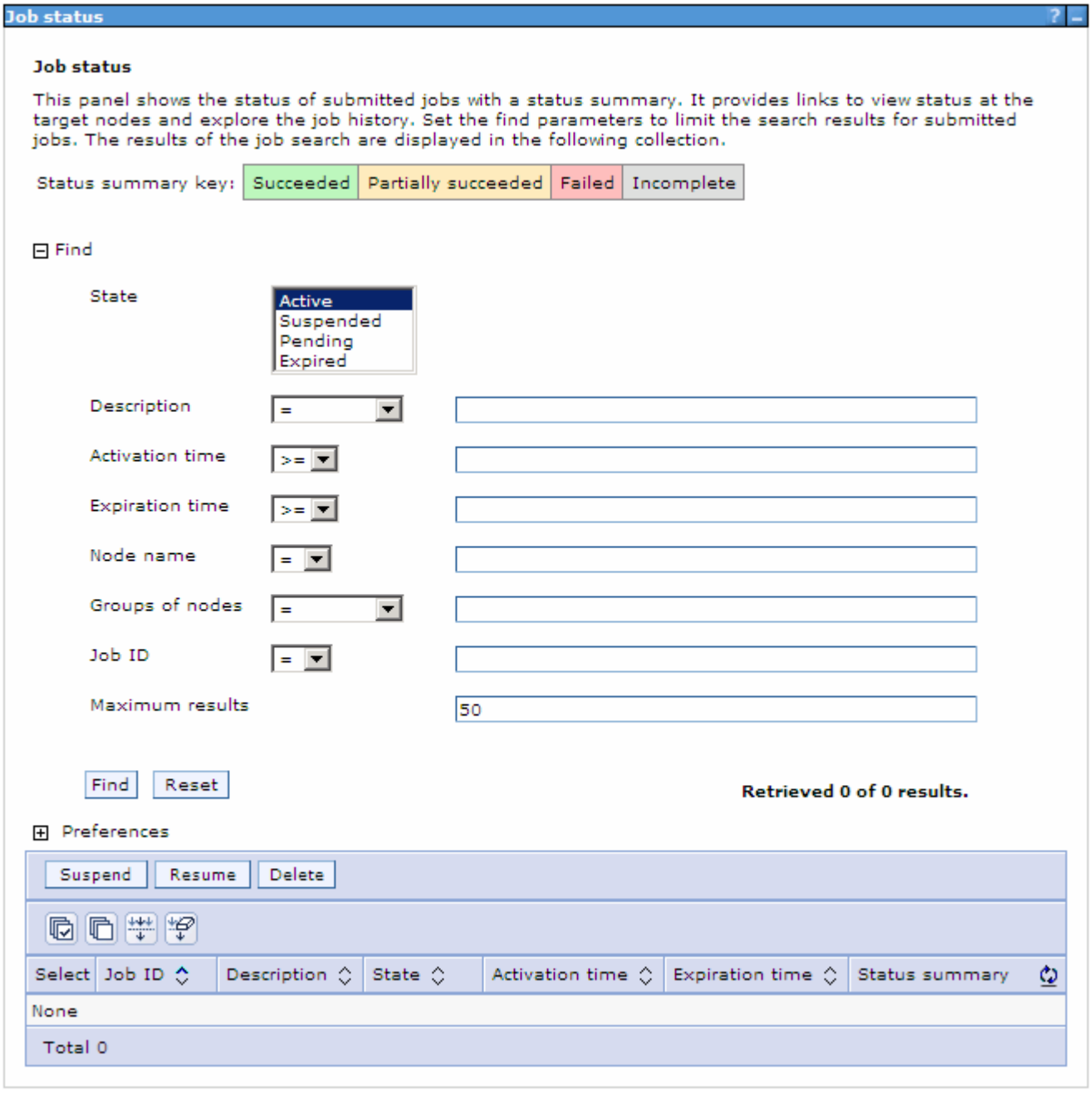
__ a. If the console is not already up, open the console by going through the windows interface **Start -> Programs -> IBM WebSphere -> Application Server Network Deployment V7 -> Profiles -> JobMgr01 -> Administrative console** or opening the URL **http://localhost:9960/ibm/console** in a browser**.**

__ b. Authenticate with the appropriate User ID and Password.

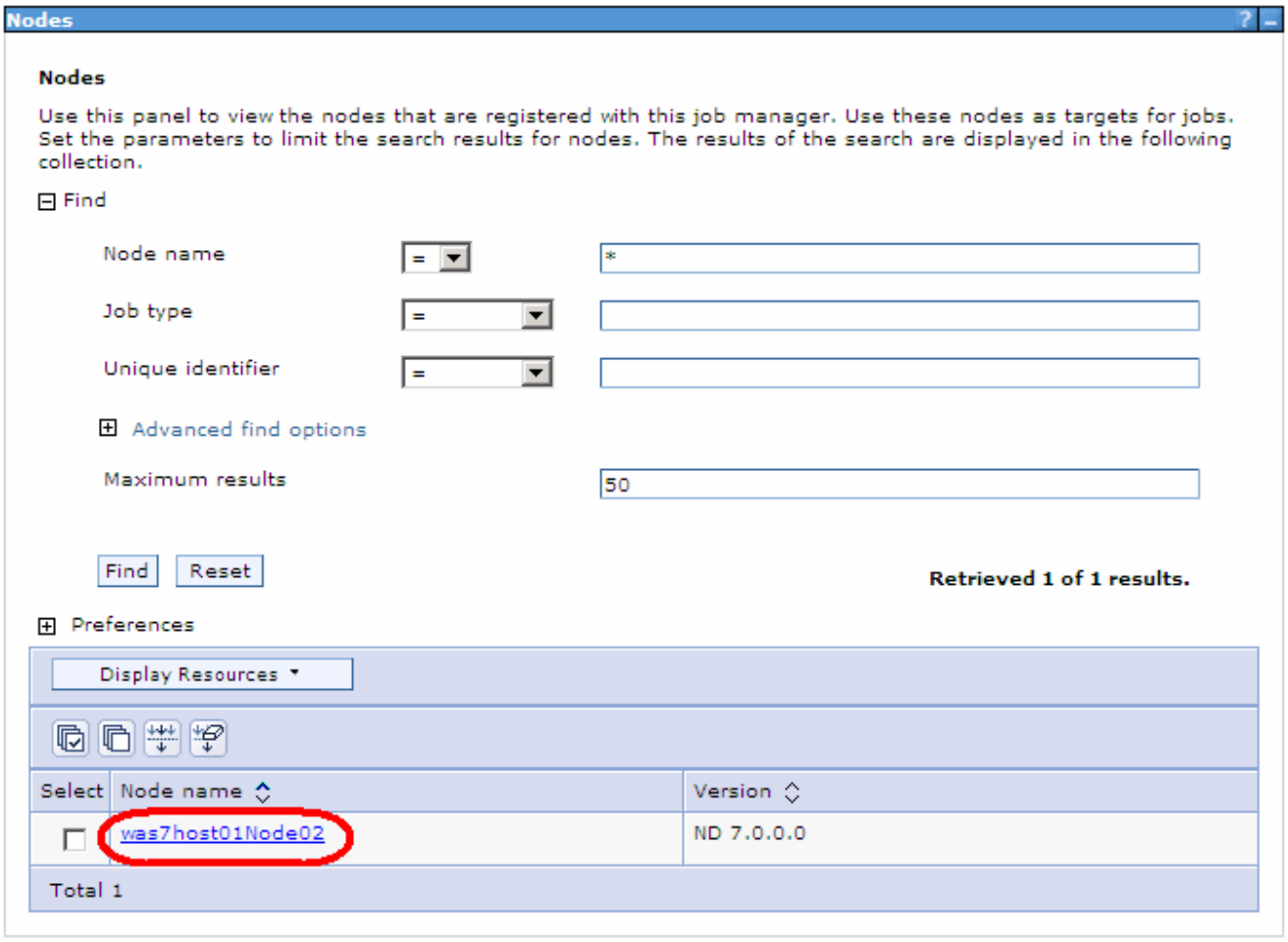
__ c. Notice that most of the console looks similar to a standard application server console. The main difference is under the **Jobs** section. Click **Submit** and look through the types of jobs that can be submitted by the job manager:



__ d. Click Status. Here it is possible to check the status of the active jobs.



__ e. Click **Nodes** to see the nodes that are registered with the job manager.



__ f. Click the **Node name** for additional information about the node.

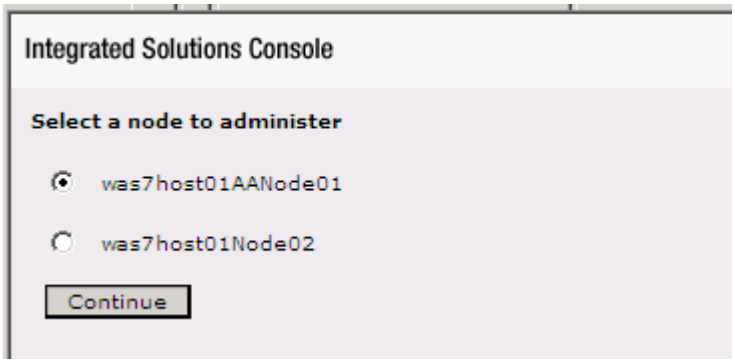
__ g. Spend a few more minutes exploring some of the additional screens within the job manager console.

____ 2. Explore the **administrative agent console**.

__ a. Open a console by going through the windows interface: **Start -> Programs -> IBM WebSphere -> Application Server Network Deployment V7 -> Profiles -> AdminAgent01 -> Administrative console** or opening the URL **http://localhost:9961/ibm/console** in a browser**.**

NOTE: Since administrative security is enabled, the browser will redirect the request to the secured administrative port.

__ b. At this point the console interface provides a choice of which node to administer.

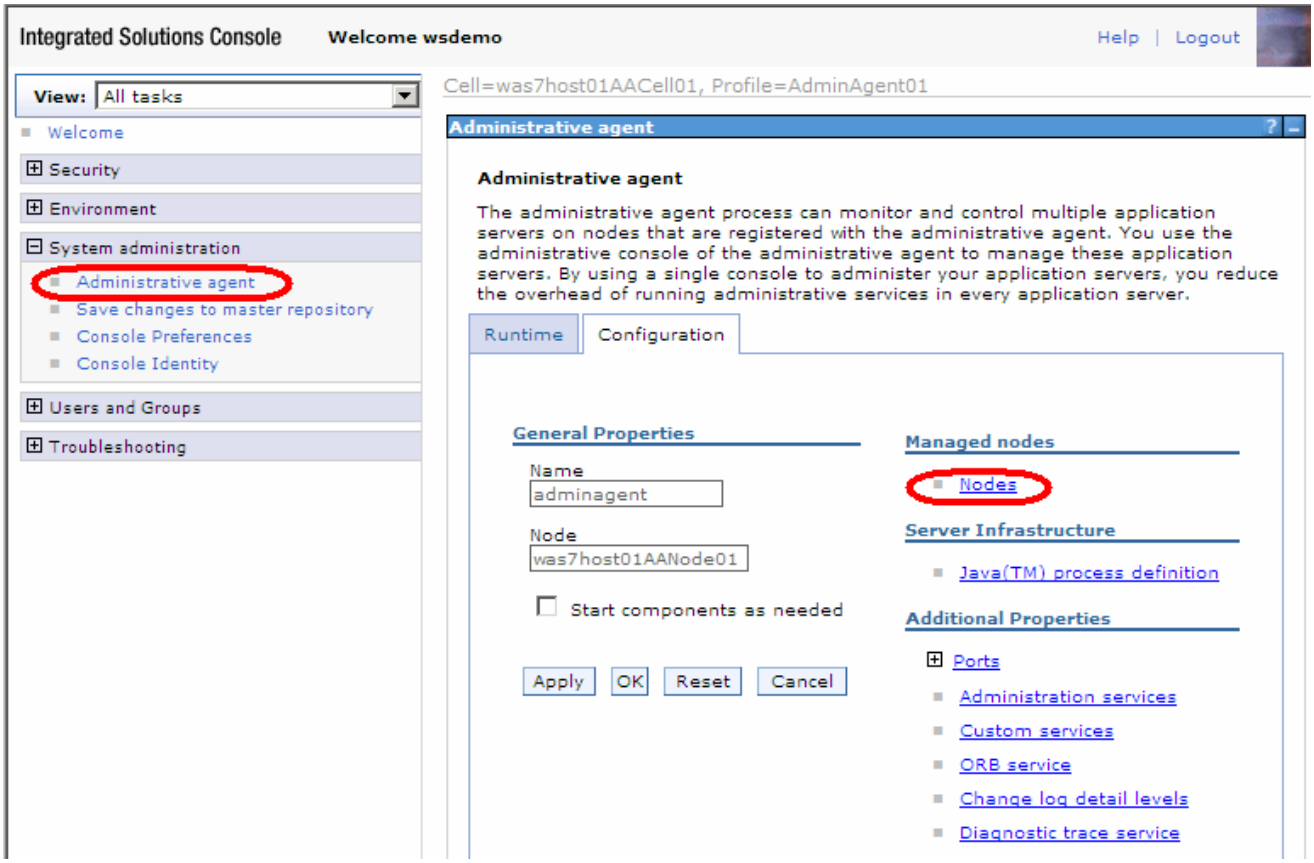


Note: What is happening at this point is that the administrative agent has actually taken over the administrative function from the stand-alone application server. This means that the console application that normally runs inside of the stand-alone application server is no longer running there. Instead this function has been taken over by the administrative agent. So, the administrative agent console is now used to administer either the administrative agent or the stand-alone application server.

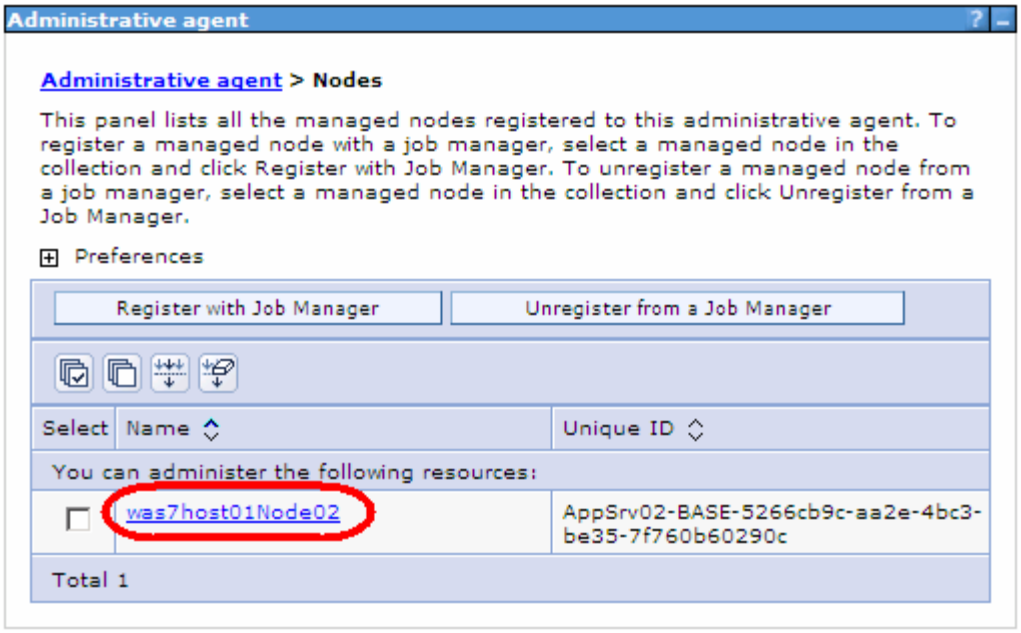
__ c. First, connect to the administrative agent and click **Continue**.

__ d. Authenticate with the appropriate User ID and Password.

__ e. Again, notice that most of the console looks similar to a standard application server console. The main difference here is under the **System administration -> Administrative agent** section.



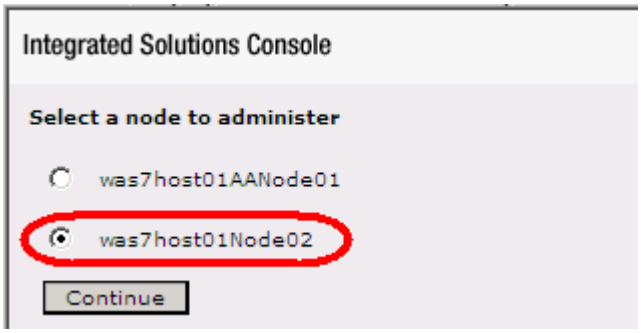
__ f. Click **Nodes** to see what nodes the administrative agent manages. Notice that this screen also allows nodes to be registered and unregistered with the job manager.



__ g. Click the node to the properties. Then look at both the Job managers and Node properties to get additional information.

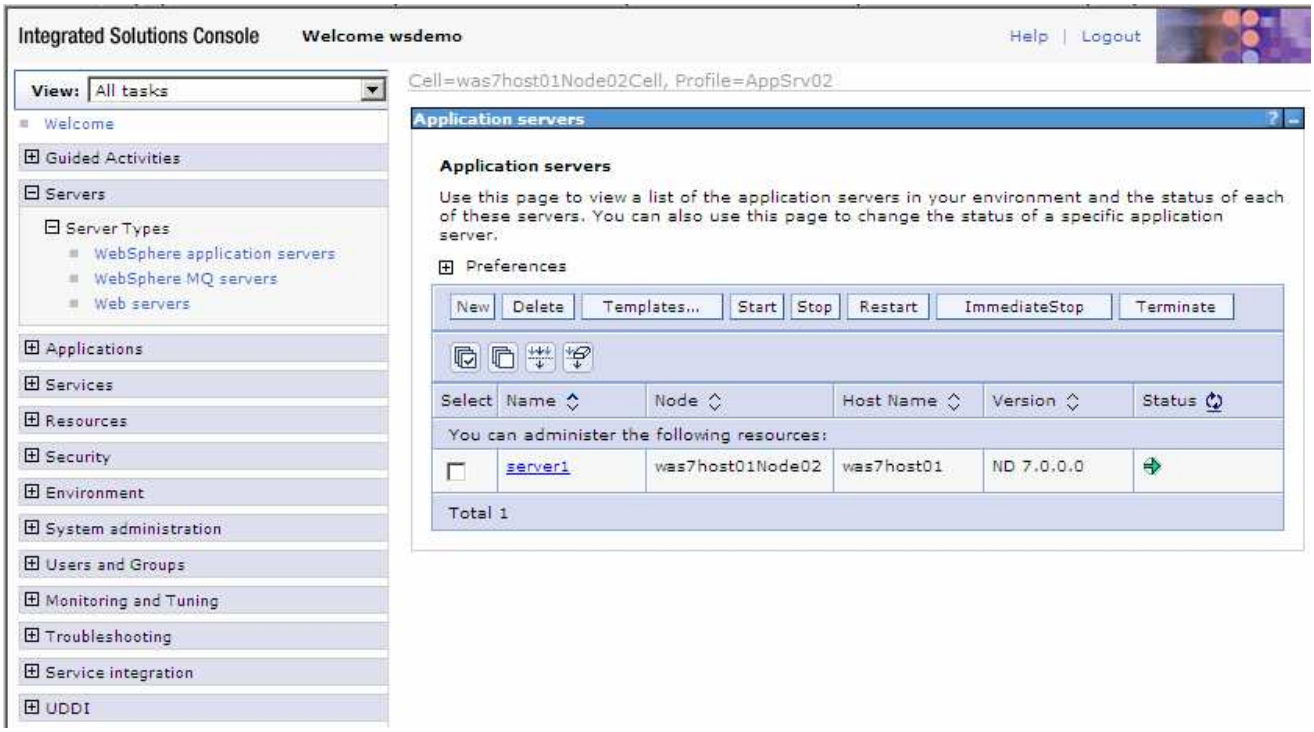
__ h. Spend a few more minutes exploring some of the additional screens within the administrative agent console.

__ i. **Logout** of the console. This returns the browser to the list of nodes. Select the **stand-alone application server node** and click **Continue**.



__ j. Authenticate with the appropriate User ID and Password.

__ k. Notice that this console looks just like a stand-alone application server console. Even though the console application is being run in the administrative agent process, it is still administering the stand-alone application server.



Part 7: Submit a job to backup the log files

This next part of the lab demonstrates another possible use of flexible management. If the environment being managed was spread over multiple application servers or cells, it might be desirable to consolidate all the log files into one backup location. This section goes through the process of backing up the log file from the stand-alone application server that is registered to the job manager.

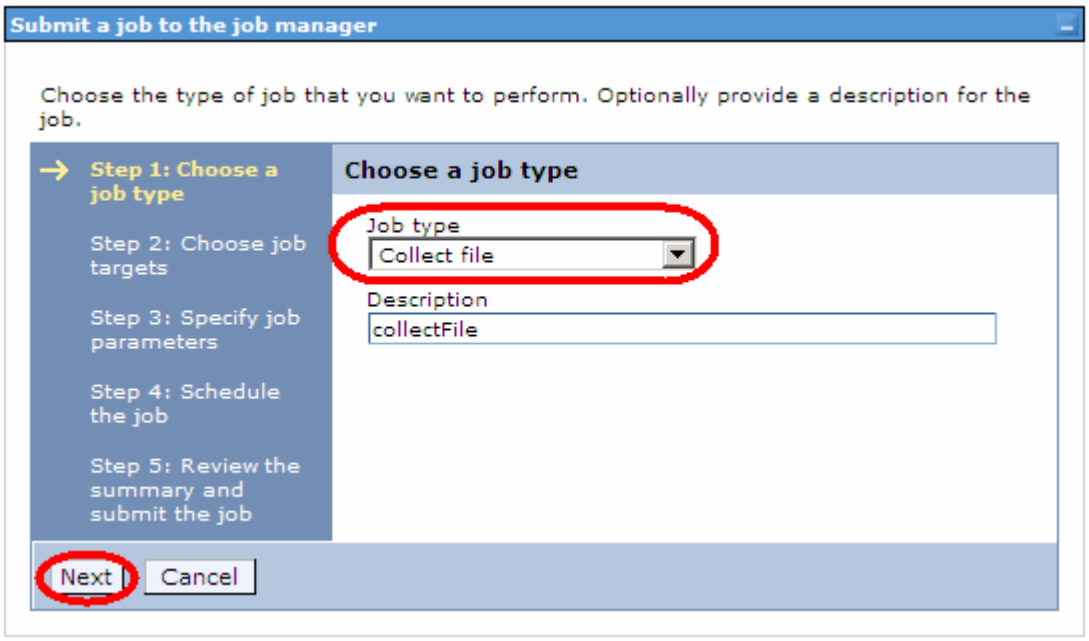
____ 1. Log into the job manager console.

__ a. The standard URL is http**://localhost:9960/ibm/console**

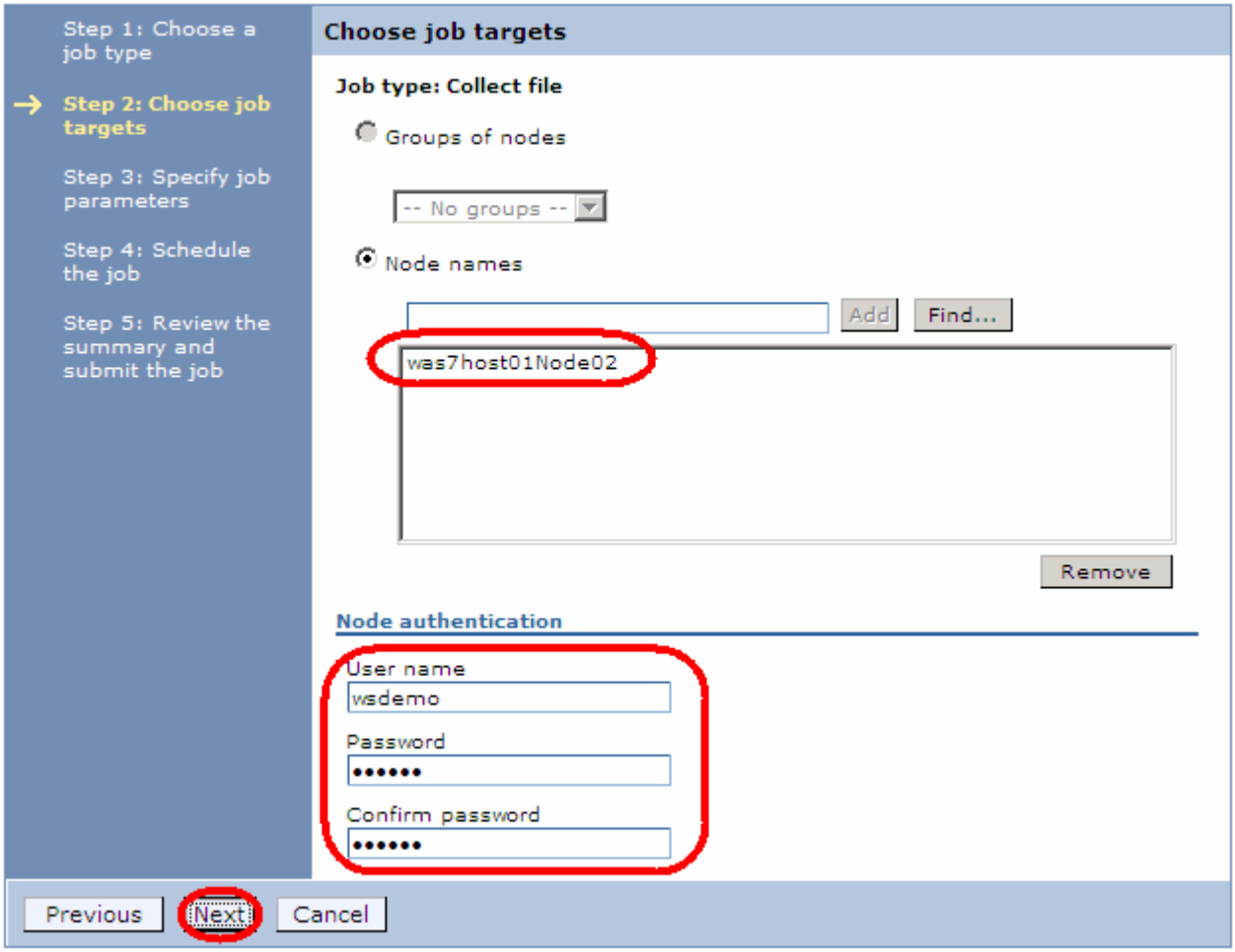
__ b. Make sure to authenticate with the correct **User ID** and **Password**. The defaults for both are **wsdemo**.

____ 2. Submit a remote job for the job manager to backup the log files from the application server.

__ a. Navigate to **Jobs -> Submit** and select **Collect file** as the **Job type**. Click **Next**.

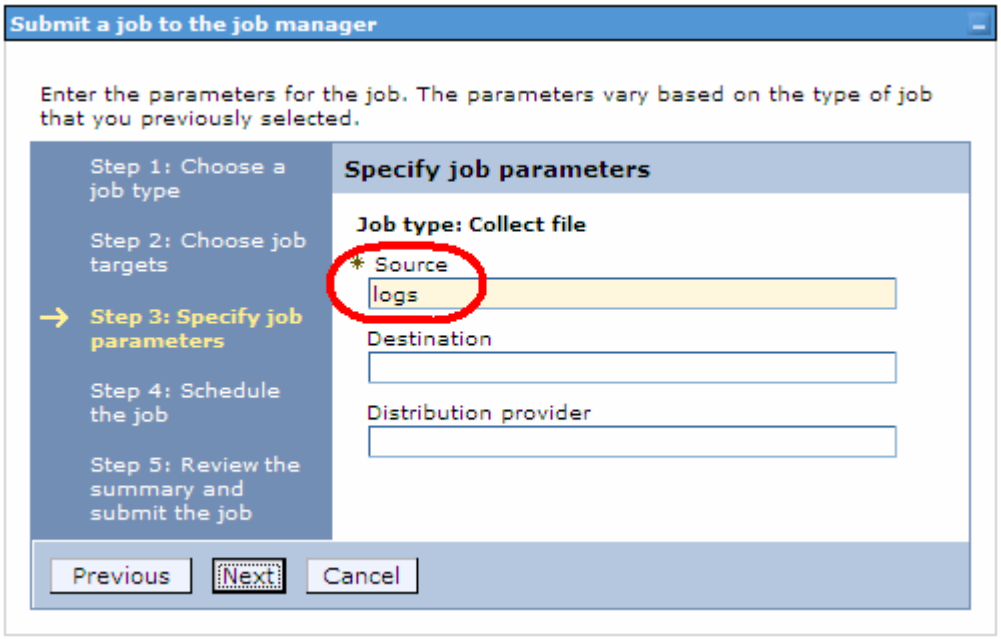


__ b. Click **Find**. **Use the same steps used in the previous part of this lab to add your node**. Once the wizard returns to this screen, enter the **User name** and **Password** into the authentication fields.



__ c. Click **Next**.

__ d. Enter **logs** into the **Source** field and click **Next**. The source location is a file or directory relative to the <profile_root>.

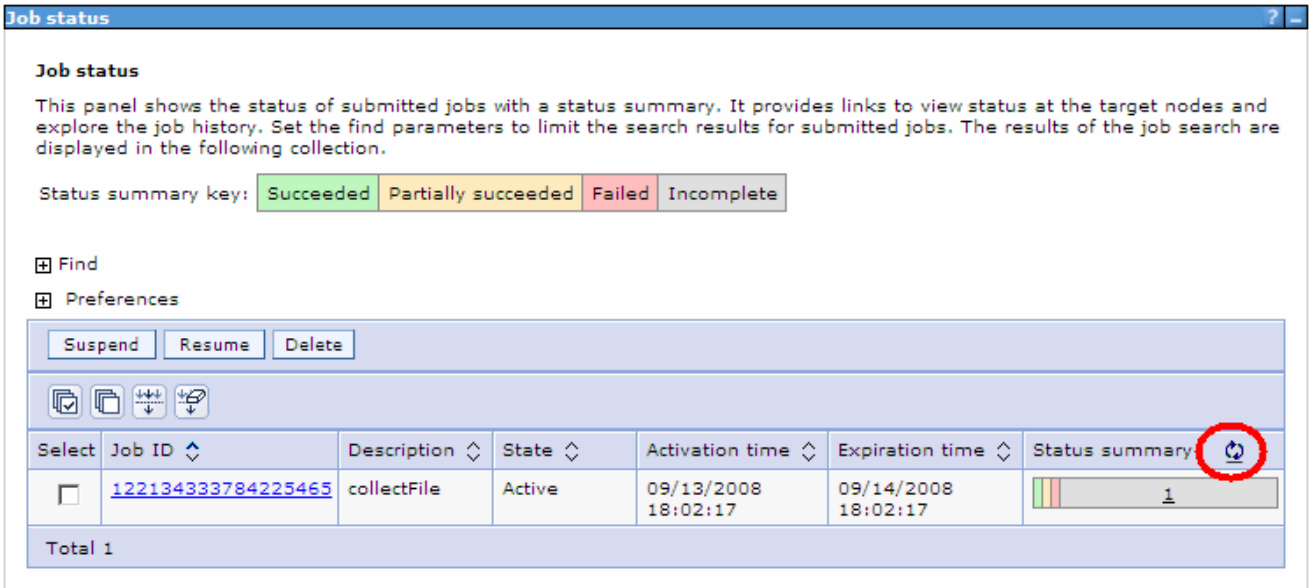


__ e. On the next screen, there are several options for job submission. For the purposes of this lab accept the defaults and submit this job for immediate submission. Click **Next**.

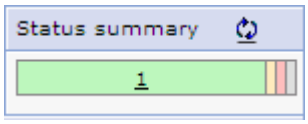
__ f. Click **Finish** on the summary screen to schedule the job immediately.

____ 3. Check the results of the job.

__ a. At this point, the console has an initial status screen. Take **note** of the **Job ID** as it may be needed as part of the directory path in a few steps.

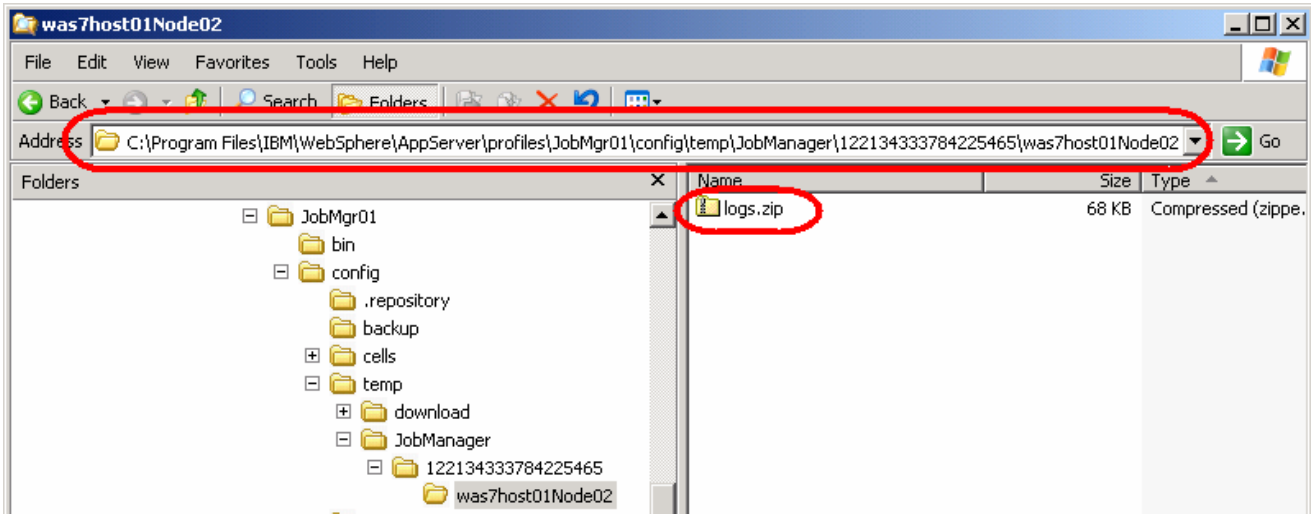


__ b. Click the refresh icon to update the status. Once the job is complete, the status is updated.



__ c. Verify that the log files where actually backed up. Using a command window or a Windows Explorer, go to the following directory:

`<WAS_HOME>\profiles\<job manager>\config\temp\JobManager\<Job ID>\<node name>`



__ d. Open the archive file and verify that the log files are available.

____ 4. **Stop the processes** for the Job Manager, the Administrative agent and the application server for the AppSrv02 profile.

What you did in this exercise

This lab has been an introduction to the Flexible Management introduced in WebSphere Application Server V7. The lab used the tools and facilities available in WebSphere Application Server 7.0 to:

- Create a job manager profile
- Create an administrative agent profile
- Create an additional application server profile
- Register the stand-alone application server with the job manager and administrative agent
- Use the job manager to start a server
- Submit a job to backup the log files, create a job manager profile and start the job manager