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Collaborative Lifecycle Management Administration Workshop

Lab Exercises

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Contents

Lab 1 Setup for the CLM 2012 Administration Workshop

Setup for the workshop involves establishing a Windows and/or Linux image and downloading the appropriate software into those images. The result is a CLM 2012 installation with an Evaluation Topology.

Labs can be run with Windows or Linux images

The first lab installs CLM 2012 into Windows. Linux can be used as well, with some special considerations for Linux issues. The remaining labs can the be run on either platform.

1.1 Prepare the Image

Start with a VMWare or Cloud image with the following characteristics:

- Microsoft Windows Server 2008 R2 64-bit with the latest service packs and updates. (You can also run this workshop on a Linux image that supports CLM, with minor adjustments to the OS specific commands in the labs.)

Once your instance is created or provisioned, you should download the software you will need (installation will be done in the labs)

VMWare Image Information

For the VMWare image used to build this workshop we assume the following values. Use similar values if you create your own image.

- Login – Administrator
- Password: passw0rd
- Memory: 4GB (minimum)
- Hard Disk: 100 GB
- Processors: 2 (minimum)
- Network: NAT

CLM 2012 Administration Workshop Cloud Image

You can create a cloud instance that already contains this lab by instantiating the image CLM 2012 Administration Workshop on the IBM SmartCloud at this location.

We recommend you use a cloud image because the image is more robust (8 CPUs, 16GB memory) and won't consume local resources. Also, this lab is focused on basic downloading and installation tasks. These tasks are required to set up CLM for the other labs in the workshop. But performing this lab will not provide much value if you are already a CLM administrator.

If you do not wish to use the cloud image, then you will need to complete this workshop to set up your environment for the other labs in this workshop.

Information on Hosting

We do this workshop with the assumption that you will be using a VMWare image for the purpose of going through the labs in the workshop. You can also do this workshop on physical hardware or a cloud instance. Just be sure that the platform that you choose for doing this workshop has sufficient memory, CPU, and disk space to be able to perform the workshop.

The values for memory and CPU shown above are adequate for the workshop, but they should not be assumed to be valid for the deployment of the Jazz CLM solution in a production environment. You may notice some performance issues during this workshop due to the limited resources. If you use a local image, try to allocate more memory and processors than minimums.

For more information on sizing hardware or computing resources for your actual deployment, see the current system requirements.

1.2 Download Installation Files

> **Use the Latest Software Versions**
> Where possible, use the latest supported version of required software. See the CLM 2012 Systems Requirements page to see the system requirements. Use the 64-bit version whenever possible.

__1. Create a new directory called C:/AdminWS

__2. Create a second new directory called C:/AdminWS/Downloads. Use this directory for all of the downloads in this workshop.

__3. Download Firefox 10 ESR and install it.

> **Firefox Extended Support Release**
> Firefox 10 is the version of the browser that CLM officially supports. Mozilla now automatically upgrades Firefox, and the version numbers increment often. The ESR provides a stable foundation that third parties can identify for their software dependencies.

__a. Use the standard installation options and keep all defaults.

__b. Launch Firefox when installation is complete. Don't import bookmarks when asked.

__c. Open the Firefox Options window.

__d. In the General tab, save files to *C:\AdminWS\Downloads*.

__e. Select the **Advanced** tab, then the **Update** tab.

__f. Select **Never check for updates**.

__g. Select **OK**.

__4. Download the CLM 2012 Web Installer.

__a. Go to the RTC 4.0 Downloads page and select the **All Downloads** tab. Under the Web Installers section, select the download link for the zip file for your platform (for Windows it would be *RTC-Web-Installer-Win-4.0.zip*).

__i. You will be prompted to login to jazz.net if you are not already logged in.

__ii. After logged in, you will be prompted to accept the license agreement prior to be able to download the file.

Improving your downloads from jazz.net
Check the tips for downloading from jazz.net

__5. Download WAS ND 64-bit (this lab was tested with version 8.0.0.3)

__a. Navigate to the WAS ND evaluation download page.

Prompted with a newer version of WAS ND?
Note that this Workshop lab was developed for WebSphere Application Server 8.0.0.3, which was also the newest supported version for CLM 2012 at the time of writing.
You may need to navigate to the *Previous Versions* section of the evaluation download page to get this specific WS ND version instead of a newer one. At the time of writing this lab the direct link was located here.
Because of these changes, some of the following steps for downloading the trial version may be slightly different from the actual ones you will need to perform.

__b. You may be prompted to login to ibm.com website. Fill out the information required for the download. If you agree to the license statement, select **I Confirm**.

__c. Select the *Installation Manager* version for your platform and click **Download Now**.

__6. Download DB2 Express-C (this lab was tested with version 10.1).

__a. Navigate to the DB2 Express-C download page

Prompted with a newer version of DB2?
As with WAS ND, newer versions of DB2 may have appeared after this lab was written.

__b. Click **Download** for the DB2 version for your platform.

__c. Fill out the information required for the download. If you agree to the license statement, select **I Confirm**.

__d. Select Download for your whether to use Download Directory or HTTP.

__e. Select the appropriate DB2 Express-C 64-bit version and click **Download Now**.

1.3 Install and Setup CLM 2012

__1. Extract RTC-Web-Installer-Win-4.0.zip file.

__2. Open l**aunchpad**

__3. Select **Install the Jazz Team Server and Applications**:

- __a. Select **Express Install**.
- __b. Select the link **Jazz Team Server with Required Base Keys, including Trials, and CCM, QM and RM Applications**. The Installation Manager will launch.
- __c. Login to jazz.net if asked.
- __d. In the first Installation Manager screen, make sure all the packages are selected. Select **Next**.
- __e. If you accept the terms of the licenses, select **Next**.
- __f. Change the shared directories as indicated, then select **Next**:
  - __i. Shared Resources Directory: **C:\AdminWS\IBM\IBMIMShared**
  - __ii. Installation Manager Directory: **C:\AdminWS\IBM\Installation Manager\eclipse**
- __g. Change the installation directories as indicated, then select **Next**.
  - __i. Installation Directory: **C:\AdminWS\IBM\JazzTeamServer**.
  - __ii. Architecture Selection: **64-bit**
- __h. Select any additional languages you desire, and select **Next**.
- __i. Make sure all the features are selected, then select **Next**.
- __j. Fill in the configurations for the package as indicated, then select **Next**
  - __i. Under Web Application Location, select **Install Tomcat 7**
  - __ii. Under Context Root Options, select **Use default 3.x/4.x application context roots**.
- __k. Review the packages to be installed, then select **Install**.
- __l. When installation completes, select **None** under *Which program do you want to start?*, then select **Finish**.

Installation Time

Installation will take a while, so use the time to read the latest news about the San Diego Chargers.

You may also want to take a look at the informative Jazz.net developer blogs.

__4. Once installation has completed, close the Launchpad.

__5. Configure the hosts file and Tomcat server for the CLM Public URI:

Public URI

Planning the Public URI you will use in your CLM installation is crucial for a good deployment.

The URI has to be defined so it is stable, can grow in the future (e.g. new applications added and their data linked). Ideally, this URI does not refer to a physical host name or installation. It should NEVER use an IP address. The goal is to allow potential future infrastructure changes with minimal constraints.

Often organizations will use a Public URI with the word "Jazz" somewhere in the URI (ie. acme.jazz.com, or acme.us.jazz).

__a. Set up fully qualified domain names.

__i. Open the etc/hosts file for editing. On Windows, this is located at **C:\Windows\System32\drivers\etc\hosts**.

__ii. Add the following line to the bottom of the file: **127.0.0.1 clm.admin.ws**

__iii. Save and close the file.

What Did I Just Do?

By adding that line to the etc/hosts file, you have told your networking software that any requests to a machine named clm.admin.ws should be routed to the 127.0.0.1 address (which is your local machine).

If you were doing this in a REAL environment, you would have your systems administrators make an entry into the DNS tables (which are used to resolve hostnames) that would route the base of your selected Public URI to the machine hosting your Jazz infrastructure.

__b. Configure Tomcat to serve applications on HTTP and HTPPS default ports:

> **We're doing this because...**
> We have decided that our public URI for CLM deployment is going to be *clm.admin.ws*. We want it to be served with no reference to ports on the server to make user access easier. This will also allow our installation to scale in the future and leverge middleware like Web Server or DNS virtual names.
>
> You will see how this is done in upcoming labs of this workshop.

__i. Open the server configuration file *C:\AdminWS\IBM\JazzTeamServer\server\tomcat\conf\server.xml* for editing.

__ii. Look for the string '9443'

__a. Change the occurrences in non-commented nodes of that *port* and *redirectPort* attributes value to **443**

__iii. Perform another search looking for the string '9080'

__a. Change the occurrences in non-commented nodes of that *port* attribute value to **80**

> **Information**
> Just the Connector nodes for HTTP and HTTPS are required to be changed for CLM. However, you don't want redirections to a port you don't want to use in your deployment and which may be in use by other services.

The resulting nodes for HTTP and HTTPS will look like the following:

```
...

<Connector port="80" protocol="HTTP/1.1"
               connectionTimeout="20000"
              redirectPort="443" />

...
```

```
<Connector port="443"
               connectionTimeout="20000"
               maxHttpHeaderSize="8192"
               maxThreads="150"
               minSpareThreads="25"
               enableLookups="false"
               disableUploadTimeout="true"
               acceptCount="100"
               scheme="https"
               secure="true"
               clientAuth="false"
               keystoreFile="ibm-team-ssl.keystore"
               keystorePass="ibm-team"
              protocol="HTTP/1.1"
              SSLEnabled="true"
               sslProtocol="${jazz.connector.sslProtocol}"
               algorithm="${jazz.connector.algorithm}"
               URIEncoding="UTF-8" />
```

__iv. Save your changes and exit.

__6. Start the CLM applications by double-clicking on ***C:\AdminWS\IBM\JazzTeamServer\server\server.startup***.

__7. Set up the CLM applications.

__a. Open a browser and run setup by navigating to https://clm.admin.ws/jts/setup. Ignore any security warnings and add a security exception if asked.

__b. Login to JTS with the login/password *ADMIN/ADMIN*.

__c. Select Express Setup, then Next.

Errors During Setup

If you receive errors during setup and need to continue, you can restart setup at any time. However, you will probably be forced to run Custom Setup.

If you run Custom Setup, just accept all the defaults and select **Next** on each screen. Some screens will require you to select an obvious button, such as Register Applications or Finalize Application Setup. In any case, each screen has a green status message that will appear indicating that the screen is complete. When you see this message you can select **Next**.

__d. In Configure Public URI, make sure the Public URI Root is **https://clm.admin.ws/jts**.

> **Fully Qualified Domain Name**
> Always use fully qualified domain names when setting up CLM applications. This can save you significant time when moving or expanding applications later. In your case, you simply added an FQDN to your etc/hosts file that you'll use during setup. The utility of this will become clearer in later labs.

__e. Select **I understand that once the Public URI is set, it cannot be modified**, then select **Next**.

__f. On the Create User page, create the admin user, and then select **Next**:

__i. User ID: adminws

__ii. Name: adminws

__iii. Password: adminws

__iv. Email: admin@clmadmin.ws

__g. Select **Next** when Express Setup is complete.

__h. Assign Licenses:

> **No Licenses Available**
> If the proper licenses are not available, you will need to install them. You can download CLM licenses for the proper version of the product from the RTC download pages.

__i. Under *Rational Team Concert*, next to *Rational Team Concert – Developer*, select **Activate Trial**.

__ii. Under Rational Requirements Composer, next to Rational Requirements Composer – Analyst, select **Activate Trial**.

__iii. Under Rational Quality Manager, next to Rational Quality Manager – Quality Professional, select **Activate Trial**.

__i. Select **Finish**. The Server Administration screen will appear.

__8. Create the MTM project.

__a. On the Server Administration screen, scroll down to the section Manage Lifecycle Projects.

__b. Select *Try out the Money That Matters sample.*

__c. Select **Create**.

__d. Confirm that you understand the warning about deploying the sample product application to a production environment, then select **Create**.

__e. Add CALs to users

__i. Select the *Members* link near the top of the window.

__ii. Make sure that *Money that Matters Sample* is the selected project. You'll see the list of users assigned to the project.

__iii. Select the Build user and give that user a Build System license. Select **Save**. Navigate back to the previous window.

__iv. Assign Analyst, Developer, and Quality Professional licenses to Al, Bob, Deb, and Tanuj. Select **Save** after selecting the license for each user.

__v. You may assign license to other users as well, but the users listed above are the ones we'll use as examples in this workshop.

__f. Quality Check: Assure that the MTM sample has been created successfully.

__i. After the creation phase ends, select arrow next to the Home button, and select JKE Banking (Change Management). Assure you can see the work items.

__ii. Select the Home button, and select JKE Banking (Quality Management). Assure you can see the testing tasks and event log.

__iii. Select the Home button, and select JKE Banking (Requirements). Assure you can see the requirements and tracing.

__9. Shut down the server by running **C:\AdminWS\IBM\JazzTeamServer\server\server.shutdown.bat.**

1.4 Install WebSphere Application Server Network Deployment

Installing WAS ND instead of standard WAS

The main features of WAS ND over other WAS options are:

- Clustering
- High Availability
- Edge Components
- Dynamic Scalability
- Advanced centralized management features for distributed configurations

WAS ND is necessary in this workshop for the clustering you'll do in later labs. In addition, we take advantage of the centralized management features of the deployment manager to emulate some distributed scenarios also in later labs.

If you don't use clustering in your environment you would normally install the version of WAS that is available to you through purchasing CLM and take advantage of simpler configuration and management.

Profile setup in standard WAS is similar, but simpler, than the process described in this lab. But the process you follow in the lab allows you to skip migrating CLM into WAS, then moving it into WAS ND. In this workshop, we will migrate directly to WAS ND to save time.

__1. Navigate to C:/AdminWS/Downloads and execute the file you downloaded for installing WAS ND. For Windows platform it will be typically called **IBMIM_win32.exe**.

__2. If prompted, enter the ibm.com developerWorks username and password you used to download the software.

__3. In the first screen, Make sure Installation Manager version 1.5.2 (or higher) and IBM WAS ND Trial 8.0.0.3 are both selected. Select **Next**.

Upgrading Installation Manager (IM)

If you have IM 1.5.2 or higher already installed, you will only see the option for the WAS ND trial.

__4. Select all the recommended packages and fixes, and select **Next**.

Validation error?

You may get an error telling you that a fix cannot be installed in your system. This will happen if the default packages selected by Installation Manager included packages for other platforms (like i5OSPPC).

You just have to select Back, uncheck those packages and continue with the installation.

__5. If you accept the terms of the license agreement, select **Next**.

__6. Answer the survey questions and select **Next.**

__7. Change the WAS ND installation directory to **C:\AdminWS\IBM\WebSphere\AppServer**. Select **Next**.

__8. Select any additional languages you want, then select **Next**.

__9. Make sure all the features are selected EXCEPT:

  __a. Sample applications

  __b. IBM 32-bit SDK for Java, Version 6

__10. Select **Next**.

__11. Review the summary information, and if everything is correct, select **Install**.

__12. In the final window displayed after installation, select **None**, then **Finish**. You will create a profile later in this lab.

1.5 Install IBM HTTP Server (IHS)

__1. Start IBM Installation Manager from the Start menu.

__2. Configure the repository for installing IBM HTTP Server:

- __a. Select **File > Preferences**
- __b. Select **Repositories** and then **Add Repository...**
- __c. Write *http://www.ibm.com/software/repositorymanager/V8WASIHSILAN* as the repository and click **OK**. You may be prompted to enter your ibm.com developerWorks credentials.
- __d. Select **OK** to exit the Preferences wizard.

__3. Select **Install**.

__4. Enter user name and password for developerWorks if asked.

__5. Select **IBM HTTP Server for WAS** and **Web Server Plug-ins for WAS**. Select **Next**.

Validation Issues

If you receive a Validation Issues error message indicating your installation requires Microsoft Visual C++ 2008 Redistributable Package, you can download the packages here:

http://www.microsoft.com/download/en/details.aspx?id=29

http://www.microsoft.com/download/en/details.aspx?displaylang=en&id=15336

And restart Installation Manager

__6. If you accept the license terms, select **Next**.

__7. Answer the questions to the survey and select **Next**.

__8. Change the directories for the install packages as indicated below, then select **Next**.

- __a. IBM HTTP Server Installation Directory: **C:\AdminWS\IBM\HTTPServer**
- __b. Web Server Plug-ins installation directory: **C:\AdminWS\IBM\WebSphere\Plugins**

__9. Make sure all packages are selected EXCEPT those listed below, then select **Next**:

- __a. IBM 32-bit Runtime Environment for Java, Version 6

__10. Set the following options for Web Server Configuration, then select **Next**:

__a. HTTP Port: **80** (default)

__b. Do NOT run IBM HTTP Server as a Windows service

__11. Verify the packages, then select **Install**.

__12. Select **Finish** when the installation is complete.

__13. Close the Installation Manager.

__14. Verify the IBM HTTP Server is installed correctly.

__a. Execute **httpd** in *C:\AdminWS\IBM\HTTPServer\bin*

__b. In a browser, navigate to http://clm.admin.ws/. You should see the IBM HTTP Server Version 8.0 splash screen.

__c. Close the browser and the httpd command window.

1.6 Setup WAS ND

Migrating from Tomcat to WAS

In a later lab, you will migrate your CLM applications from Tomcat to the WAS profile that you are creating here.

__1. Start the Profile Management Tool from the Start menu.

__2. Select **Create** in the WebSphere Customization Toolbox.

__3. Select **Cell**, then select **Next**.

About the Cell Profile

A profile in WebSphere Application Server tailors the execution of the product binaries to certain runtime definition.

Because we are working with WAS ND, we are creating two profiles:

- The deployment manager profile defines a deployment manager in a distributed server environment. The deployment manager is the central administration point of a cell and provides, among other things, an administrative console to administer the servers it manages and the concept of a master configuration repository for them.
- The application server profile (“CLMAppSrv01”) defines an application server under control of the Deployment Manager.

This combination of a deployment manager profile and an application server profile is known as a Cell profile in WAS.

__4. Select **Advanced profile creation**, then select **Next**.

__5. Make sure both options are selected, then select **Next**.

__a. **Deploy the administrative console**: check

__b. **Deploy the default application**: check

__6. Set the profile names and locations, then select **Next**.

__a. Deployment manager profile name: **CLMDMgr01**

__b. Application server profile name: **CLMAppSrv01**

__c. Leave the Profile directory set to the default.

__7. Set the Node, Host, and Cell Names, then select **Next**.

__a. Deployment manager node name: **CLMCellMgr01**

__b. Application server node name: **CLMNode01**

__c. Host name: **clm.admin.ws**

__d. Cell name: **CLMCell01**

Some more WAS concepts

The configuration we are performing with WAS ND creates the following elements for us:

- A cell ("CLMCellMgr01"): a cell is a grouping of nodes into a single administrative domain. This cell can consist of multiple nodes, which are all administered from a single point, the deployment manager.
- A node for each profile: a node is an administrative grouping of application servers for configuration and operational management.

__8. Make sure **Enable administrative security** is selected and the user name and password are set. Then **Next**.

__a. Username: **wasadmin**

__b. Password: **wasadmin**

__9. On Secuirty Certificate (Part 1), accept the defaults and select **Next**:

__a. Create a new default personal certificate

__b. Create a new root signing certificates

__10. On Security Certificate (Part 2), keep all the defaults and select **Next**

Keystore Password

Note that the default keystore password is **WasAS**.

__11. Accept all the default port values in Port Values Assignment Part 1, and then Part 2. Note that since this is the first node you're creating, all the actual port values are the same as the default port values. Select **Next** to the screens for both parts.

__12. UNCHECK the option to **Run the deployment manager process as a windows service**. You will start and stop the deployment manager manually. Select **Next**.

> **Start WAS Nodes and Profiles Manually**
> It's generally a good practice to manually start the WAS profiles for CLM. Starting profiles automatically can result in failure to start as some dependencies may not be available as the system is starting up.

__13. Check the option to **Create a Web server definition**. Provide the following values, then select **Next**.

- __a. Select the option **Create a Web server definition**.
- __b. Web server name: **clmwebserver1**
- __c. Web server port: **80** (default)
- __d. Web server host name: **clm.admin.ws**
- __e. Leave the default values for **Web server type** and **Web server operating system**.

__14. Set the correct web server directories, then **Next**.

- __a. Web server installation directory path: **C:\AdminWS\IBM\HTTPServer**
- __b. Web server plug-in installation directory path: **C:\AdminWS\IBM\WebSphere\Plugins**

__15. Review the summary information, and if it's correct, select **Create**.

__16. After the profile is created, UNCHECK **Launch the First steps console**, then **Finish**. Close the Profile Management Tool (WebSphere Customization Toolbox).

__17. Verify the cell and profile have been created successfully.

- __a. Start the Deployment Manager by selecting **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Start the deployment manager**.
- __b. After the deployment manager has launched (the command window will disappear), start the node. Go to the file system and double-click on **C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin\startNode.bat**

Start Nodes Manually in WAS ND

A node consists of the node agent and the servers. When a node agent is stopped, the deployment manager has no way to communicate with it to manage the servers hosted in the node. So after the Deployment Manager is launched, you must start the node manually as described in the previous step. The application server, which runs in the node, is started through the Administrative Console in the next step of this lab.

If you use standard WAS, you will start the application server when you launch its WAS profile, which you would do like you launched the Deployment Manager (via the Start menu).

__c. Start the application server

__i. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**.

__ii. Accept and add any security exceptions that appear.

__iii. Login with wasadmin/wasadmin

__iv. Select **Servers > Server Types > WebSphere application servers**.

__a. You may have to select WebSphere Application Server in the View drop-down box to see the Servers link.

__v. Select the box next to server1, then select **Start**.

No Server Status

If the Status icon shows a “?” instead of a red X in the Status column, the node agent is probably not started. Go to System Administration > Node agents. If you see a “?” instead of a green arrow in the Status column, you need to stop and restart the node.

Go to C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin and double-click on stopNode.bat (use wasadmin/wasadmin when asked for a login).

After that completes run startNode.bat. Return to the WAS console and refresh the page. You should see a green status arrow for nodeagent. Return to the previous step and attempt to start the server.

__vi. The server has been started when the Status changes to a green arrow.

__d. Verify that you can snoop the server.

__i. In your browser, navigate to https://clm.admin.ws:9443/snoop.

__ii. Allow all security exceptions.

__iii. You should see a status page that shows basic information about the host.

__18. Shut down the node (and managed servers) by executing **C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin\stopNode.bat**.

__a. If you're asked for a login, use wasadmin/wasadmin.

__19. Shut down the deployment manager by selecting **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Stop the deployment manager**.

__a. If you're asked for a login, use wasadmin/wasadmin.

__20. Close the browser window.

1.7 Set Up External User Registry

In a production environment, the Jazz Team Server users will probably already exist in the corporate user registry.

You need to create the user registry yourself in this workshop. This way you'll already have an LDAP user registry ready when you change your CLM installation to use an external user registry in a later lab.

This workshop uses LDAP in windows Active Directory. Some setup information will be different in your corporate environment.

__1. Place the files **installads.input.txt** and **createADJazzobjects.bat** in **C:\AdminWS\Downloads**. These files are included with the workshop materials.

__2. Startup a command window as the Administrator, navigate to C:\AdminWS\Downloads, and run the following statements:

```
servermanagercmd.exe -I ADDS-Domain-Controller

dcpromo.exe /unattend:c:\adminws\downloads\installads.input.txt
```

__3. Microsoft Active Directory will be configured and the OS will restart.

__4. Log in

__a. Notice that you are now in the CLMADMIN domain.

New Password May Be Required

Security policies may require that you enter a new password. If so, create a password that matches your policies and remember it.

__5. Change the security policies.

Simple Security Policies

Your corporate security policies will be defined by your organization. To make this workshop simpler, you'll reduce the security policies to match the simple passwords found in the MTM sample project.

Security policies can sometimes have consequences for a Jazz deployment. Be aware that if some of the service accounts used in a Jazz deployment suddenly "stop working", it may be because of your local security policies. Always monitor the operation of your Jazz deployment, and have a timeline of when issues began to occur in your environment. This can be critical information when debugging issues.

__a. Make clmadmin a Domain Admin

__i. Select **Start > Administrative Tools > Active Directory Users and Computers**

__ii. Select **clm.admin.ws > Users**

__iii. Right-click the *clm.admin.ws* user and select **Properties**.

__iv. Go to the *Member Of* tab and select **Add...**

__v. Enter *Domain Admins* in the edit field, then select **Check Names**. You should see *Domain Admins* underlined, indicating it found the domain. Select **OK**, then **OK** to close the Properties window.

__vi. Logout, then login again.

__b. Select **Start > Administrative Tools > Group Policy Management**.

Group Policy Management Not Installed

If you can't see the Group Policy Management under Administrative tools, it probably needs to be installed. You should follow these instructions to install it. (https://blogs.technet.com/b/askds/archive/2008/07/07/installing-gpmc-on-windows-server-2008-and-windows-vista-service-pack-1.aspx?Redirected=true)

__c. Select **Group Policy Management > Forest: clm.admin.ws > Domains > clm.admin.ws > Default Domain Policy**.

__d. Select the **Settings** tab.

__e. After the report is generated, go to **Computer Configuration > Policies > Windows settings > Security Settings > Account Policies/Password Policy**

__f. Right-click on one of the policies and select **Edit**.

__g. Select **Default Domain Policy > Computer Configuration > Policies > Windows Settings > Security Settings > Account Policies > Password Policy**.

__h. Change the following settings by double-clicking the policy, entering the value, and selecting **OK**:

__i. Maximum password age: 0

__ii. Minimum password age: 0

__iii. Minimum password length: 2 characters

__iv. Password must meet complexity requirements: disabled

__i. Close the Group Policy Management Editor.

__j. Close the Group Policy Management window.

__k. Select **Start > Run** and enter the following:

```
gpupdate /force
```

__6. Add the Active Directory Lightweight Directory Services

__a. Select the **Start** menu, right click on **Computer**, and select **Manage**.

__b. Under **Server Manager**, right click on **Roles** and select **Add Roles**. You might have to wait a moment until the **Add Roles** option is enabled.

__c. On the **Before You Begin** screen, select **Next**.

__d. On the **Select Server Roles** screen, select **Active Directory Lightweight Directory Services**. Then select **Next**.

__e. Select **Next** on the remaining screens. On the Confirmation screen, select **Install**. When the installation is complete, select **Close**.

__f. After the service is created, select **Active Directory Lightweight Directory Services** under **Roles** in the **Server Manager** at the left side of the window.

__g. Select the link **Click here to create an AD LDS instance**.

__h. Accept the defaults in the creation dialog by selecting **Next** on each screen UNTIL you reach the Ports section and enter this values:

__i. LDAP Port Number: **50001**

__ii. SSL Port Number: **50002**

Why these ports?

The Active Directory Lightweight Directory Services wizard suggests 50000 as the default port number. Later in this lab you will install DB2 database, which also suggests the 50000 as the default port.

We are changing the port of the Active Directory LDAP service to preserve the DB2 default port. This is not mandatory but keeping that database port number will allow us to keep consistent with examples you can find in the infocenter documentation.

__i. Select **Next** accepting the default values for the rest of the screens

__j. Select **Finish** when the setup is complete.

__k. Close the Server Manager window.

__7. Add groups and CLM users to Active Directory.

__a. Open a command window and navigate to **C:\AdminWS\Downloads** and enter:

```
createADJazzobjects
```

__b. Make sure all the entries show that they succeeded.

__c. Close the command prompt.

__8. Add db2admin to more groups

__a. Select **Start > Administrative Tools > Active Directory Users and Computers**

__b. Select **clm.admin.ws > Users**

__c. Right-click on db2admin and select Properties

__d. Select the *Member Of* tab, then select **Add...**

__e. Enter *DB2ADMNS*, then select Check Names. *DB2ADMNS* should be underlined. Select **OK**.

__f. Select **Add...** again. Enter *Administrators*, then select Check Names. *Administrators* should be underlined. Select **OK**.

__g. Select **OK** again.

__9. Health Check

__a. Examine users in the Active Directory Users and Computers application.

__i. Assure that users *adminws*, *al*, and *bob* exist.

__ii. Double click on **adminws** and select the **Member Of** tab. Assure adminws is a member of JazzAdmins.

__iii. Double click on **bob** and select the **Member of** tab. Assure bob is a member of JazzUsers.

__10. Close all open windows.

1.8 Install DB2 Express

__1. Start the DB installer.

- __a. Double click the file you downloaded from developerWorks (for the Windows 64-bit DB2 v10.1 it will be called *db2_v101_winx86_64.exe*), and unzip the installation to **C:\AdminWS\Downloads\db2_install**.
- __b. If the DB2 installation wizard doesn't start automatically, run **setup.exe** from the db2_install/expc directory.
- __c. Click the **Install a Product** link to start your installation.
- __d. Under **DB2 Express-C**, click **Install New**.

__2. In the installation wizard take all the defaults, except:

- __a. Installation type: Compact
- __b. Installation folder: **C:\AdminWS\IBM\SQLLIB**
- __c. IBM SSH server installation folder:
  - __i. Directory: C:\AdminWS\IBM\IBM SSH Server\
  - __ii. Do not autostart the IBM SSH server
- __d. In the Local user or Domain user account, enter the following values:
  - __i. Domain: **CLMADMIN**
  - __ii. User name: **db2admin**
  - __iii. Password: **db2admin**. This workshop will assume you entered `db2admin` for the password.

__3. When you reach the last installation screen, select **Finish** to exit the setup wizard.

__4. Close the First Steps welcome window that appears.

1.9 Summary

You have installed CLM 2012 in an evaluation topology. You have also prepared your system to migrate to departmental and enterprise topologies by installing enterprise software and setting up a user registry external to CLM.

Lab 2 Departmental Topology

Move from an Evaluation to a Departmental Topology so you can support more teams, include more team members, and fit better into your organization's environment.

Overview

In this lab you will upgrade from your existing Evaluation topology to a Departmental topology. This topology can support more people, projects, and data. It will also support a more complex organization.

Imagine that your small team started using CLM by downloading and installing it on your own local machine or server. You did an Express install and set up the simplest environment to keep your administrative overhead low. Over time you used RTC to manage your small team (probably by using the OpenUP or Scrum processes), you used RQM to manage your team's testing, and RRC to create your team's requirements and assure they're implemented and tested. Other teams saw the value of your approach and started jumping on your little server. Now lots of teams have important project assets managed by Jazz-based products. Hooray!

Of course, your IT department has gotten wind of your little skunkworks project and they want to bring you into their warm cocoon of security and enterprise database platforms. They also don't like you managing your own servers. And besides, everyone's hearing about how much better it is to use tools that support CLM. So now you need to move your installation from the simple Tomcat application server and Derby database to more robust platforms than can handle the increased security demands, larger number of people, and greater number of projects.

In reality, you might upgrade one part of your system at a time. After you get to 10 users, you'll want to move from the Derby database to DB2. When your IT department starts to squeal about corporate security policies, you'll need to switch to your corporate user registry. And when the complexity and number of projects start to slow down your work, you'll want to move from Tomcat to WebSphere Application Server (WAS) for better application performance. Switching to WAS also gives you much greater flexibility when migrating to future topologies.

The steps we'll follow are:

1. Access a corporate LDAP user registry instead of the local JTS user registry for login security.
2. Migrate from the default Derby database to DB2.
3. Migrate from the default Tomcat application server to IBM Websphere's WAS ND, including connecting to your user registry.
4. Check the health of your new installations.

Lessons Learned:

- Migrate to enterprise platforms (DB2, WAS, LDAP).

WAS and WAS ND

In this lab we use WAS ND rather than standard WAS. This is partly to make the workshop more efficient. Future labs on clustering need WAS ND, so if you were to use WAS in this lab you would need to install and migrate to WAS ND later on.

The result is that you need a few extra simple steps to set up CLM on WAS ND, and you need to understand the basic structure of how applications run in WAS ND.

In WAS ND, instead of starting a profile you start a deployment manager. Within the deployment manager you run one or more nodes (you'll just run one node in this workshop). Within that node you run a server, which is the application server within which the CLM applications will run.

So the extra steps you'll perform to support WAS ND involve starting/stopping the deployment manager (instead of a profile), starting/stopping/syncing the node inside the deployment manager, and deploying the applications to a server (instead of a profile) within that node.

2.1 Migrate to an External User Registry (LDAP)

__1. If the JazzTeamServer and CLM applications are not started, start them by running ***C:\AdminWS\IBM\JazzTeamServer\server\server.startup***.

__2. In a browser, run setup wizard: https://clm.admin.ws/jts/setup

  __a. Accept any untrusted connection messages and add a security exception if possible.

__3. Login as *adminws/adminws*

__4. Select **Custom Setup** if it's not already selected.

__5. Step through the setup wizard by selecting **Next** until you reach the **Setup User Registry** page (after the Register Applications page).

__6. Select **LDAP**

How careful do I have to be here?

You need to be very careful when doing this portion of the workshop.

- In the User Property Names Mapping, make sure that you have the capitalization correct, it begins with a lowercase “s”, has a capital “AMA”, and the rest is lowercase.
- In the Group Member Property do not accept the default value of “members” with an s, instead you should use “member” (with no s on the end).

__7. Set the properties:

  __a. LDAP Registry Location: ldap://clm.admin.ws:389

  __b. User name: cn=adminws,cn=Users,dc=clm,dc=admin,dc=ws

  __c. Password: adminws

  __d. Base User DN: cn=Users,dc=clm,dc=admin,dc=ws

  __e. User Property Names Mapping: userId=sAMAccountName,name=cn,emailAddress=mail

  __f. Base Group DN: cn=Users,dc=clm,dc=admin,dc=ws

  __g. Jazz to LDAP Group Mapping: JazzAdmins=JazzAdmins, JazzUsers=JazzUsers, JazzDWAdmins=JazzDWAdmins, JazzProjectAdmins=JazzProjectAdmins, JazzGuests=JazzGuests **(this is the default)**

  __h. Group Name Property: cn **(this is the default)**

__i. Group Member Property: member (**not** the default)

__j. Select Compute and save additional LDAP queries based on these configuration values

Specify the following properties to configure Jazz Team Server to map to users in the LDAP server.

Property	Current Value
Base User DN Base distinguished name of users in the LDAP registry.	cn=Users,dc=clm,dc=admin,dc=ws Default Value ou=people,dc=jazz,dc=net
User Property Names Mapping Mapping of Jazz user property names to LDAP registry entry attribute names. The mapping should be represented as {contributorAttributeName1}={LDAPEntryAttributeName1},{contributorAttributeName2}={LDAPEntryAttributeName2}...	userId=sAMAccountName,name=cn,emailAddress=mail Default Value userId=uid,name=cn,emailAddress=mail

Specify the following properties to configure Jazz Team Server to map to groups in the LDAP server.

Property	Current Value
Base Group DN Base distinguished name of the Jazz application groups in the LDAP registry.	cn=Users,dc=clm,dc=admin,dc=ws Default Value ou=JazzGroups,dc=jazz,dc=net
Jazz to LDAP Group Mapping Mapping between Jazz groups and LDAP groups. One Jazz group can be mapped to multiple LDAP groups. The LDAP groups must be separated by a semi colon. For example, JazzAdmins=LDAPAdmins1; LDAPAdmins2 maps JazzAdmins group to LDAPAdmins1 and LDAPAdmins2.	JazzAdmins=JazzAdmins, JazzUsers=JazzUsers, JazzDWAdmins=JazzDWAdmins, JazzProj Default Value JazzAdmins=JazzAdmins, JazzUsers=JazzUsers, JazzDWAdmins=JazzDWAdmins, JazzProjectAdmins=JazzProjectAdmins, JazzGuests=JazzGuests
Group Name Property Property to represent the name of the Jazz groups in the LDAP registry.	cn Default Value cn
Group Member Property Property to represent the members of a group in the LDAP registry.	member Default Value members

Based on the configuration values provided above, we can compute the remaining LDAP queries. It is recommended that you select the option below to compute the additional queries. You can view and modify the computed settings at any time from the Admin Configuration UI.

☑ Compute and save additional LDAP queries based on these configuration values

✓ LDAP connection is established. Click Next to continue.

Restore to Saved | Test Connection | Save Tomcat Config Files

__8. Select **Test Connection**.

__a. You should see the green status message LDAP connection is established. Click Next to continue. If not, fix your LDAP properties. Do NOT select Next.

Troubleshooting

You may get a warning that one or more users in the LDAP registry, such as “krbtgt”, do not contain the correct e-mail address properties.

You can fix this by modifying the mail parameter for the user via the **ADSI Edit** tool, available in **Start > Administrative Tools**.

If the tree is not showing under the ADSI Edit node, right-click on the ADSI Edit node, select **Connect To...** and enter **LDAP://clm.admin.ws** in the Name field, then **OK**.

Open the tree until the CN=Users node appears, and open that node as well. Right-click and open the properties for the desired user.

The **mail** attribute should be ***username*@clmadmin.ws**.

Note that it is important for the users that will be part of the CLM solution to have the ID, name and email is attributes correctly set. Others (like system special accounts), could be safely ignored.

Select **Test Connection** again and make sure the LDAP connection is established (you'll see a green message).

__9. Select **Save Tomcat Config Files**. You'll see the message indicating that the new files have been created.

__10. Select **show details** to see the locations of the files that were created. Make a note of these locations. They should all be in the ***C:\AdminWS\IBM\JazzTeamServer\server\tomcat\webapps\<application>\WEB-INF*** and ***C:\AdminWS\IBM\JazzTeamServer\server\tomcat\conf*** directories. The files are all named *web-LDAP<string>.xml* or *server-LDAP<string>.xml*, where <string> is a string of numbers related to the date and time the file was created. The files will be in the following directories under **C:\AdminWS\IBM\JazzTeamServer\server\tomcat**:

__a. conf

__b. webapps\admin

__c. webapps\ccm

__d. webapps\jts

__e. webapps\qm

__f. webapps\rm

__11. Select **Next**. The user registry information is updated, and the *Configure Data Warehouse* page is displayed.

__12. At this point you can quit Setup by closing the window. You could also continue to select Next until you reach the Summary page. This will just accept all the existing CLM setup information.

__13. Shutdown the Jazz Team Server by running ***C:\AdminWS\IBM\JazzTeamServer\server\server.shutdown***

__14. Replace existing web.xml and server.xml files by going to each of the directories indicated in step 10 and doing the following:

__a. Under *C:\AdminWS\IBM\JazzTeamServer\server\tomcat,* go to each *webapps\<application>\WEB-INF* directory and the *conf* directory and do the following:

__i. Rename the existing *web.xml* or *server.xml* to *old_web.xml* or *old_server.xml*. Do not rename the *web.xml* file in tomcat\conf.

__ii. Rename the file that was created in the earler step from *web-LDAP<string>.xml or server-LDAP<string>.xml* to *web.xml* or *server.xml.*

__15. Restart the CLM applications (**Start > All Programs > Jazz Team Server > Start the Jazz Team Server...** or **run server.startup**)

__16. Health Check:

__a. Check the list of active users and be sure you see the notice that that an external registry is being used.

__i. In the browser, navigate to https://clm.admin.ws/jts/admin. Login as *adminws/adminws*.

__ii. Select **Users > Active Users**

__iii. Select **Bob**. Assure There's a blue message at the top indicating that the details of his account are read-only due to it being handled by an external user registry.

2.2 Migrate from Derby to DB2

Information
The steps in this section are taken from the IBM Infocenter, at: https://publib.boulder.ibm.com/infocenter/clmhelp/v4r0/topic/com.ibm.jazz.install.doc/topics/t_migrate_derby_db2.html

__1. Stop the servers.

__a. Run **server.shutdown** in **C:\AdminWS\IBM\JazzTeamServer\server**.

__2. Backup the current databases.

__a. Open a command window and navigate to **C:\AdminWS\IBM\JazzTeamServer\server**.

__b. Execute the following commands:

```
repotools-jts -export toFile=JTSData.tar
repotools-ccm -export toFile=CCMData.tar
repotools-qm -export toFile=QMData.tar
```

Where's the RRC Database?
Unlike RTC and RQM, RRC does not use its own database. It uses the same database that JTS uses. This is why you can only have one RRC application associated with any single Jazz Team Server.

-export is only for migrating to a different vendor's database
Don't use -export for copying or backup. It is only designed to be used to migrate CLM data from one vendor's database to another.

__3. Start the DB2 database if it isn't already started.

__a. Check the icons in the lower right corner of the Windows screen.

__b. If the DB2 icon shows a red mark on it, select the icon and select **Start (DB2)**.

__4. Create the new databases.

__a. Launch the DB2 Command Editor by selecting **Start> All Programs > IBM DB2>DB2COPY1>Command Line Processor**.

__b. Create the JTS, RTC, RQM, and Data Warehouse (DW) databases, and grant admin authority to the db2admin user, by entering the following commands into the Command Line Processor.

Repeat the commands below 4 times, replacing <DBNAME> with JTS, then CCM, then QM, then DW.

```
create database <DBNAME> using codeset UTF-8 territory en PAGESIZE 16384
connect to <DBNAME>
grant dbadm on database to user db2admin
disconnect <DBNAME>
```

Alternatively, you can paste this text directly into the command prompt window:

```
create database JTS using codeset UTF-8 territory en PAGESIZE 16384
connect to JTS
grant dbadm on database to user db2admin
disconnect JTS

create database CCM using codeset UTF-8 territory en PAGESIZE 16384
connect to CCM
grant dbadm on database to user db2admin
disconnect CCM

create database QM using codeset UTF-8 territory en PAGESIZE 16384
connect to QM
grant dbadm on database to user db2admin
disconnect QM

create database DW using codeset UTF-8 territory en PAGESIZE 16384
connect to DW
grant dbadm on database to user db2admin
disconnect DW
```

__c. Leave the command prompt open.

> **Data Warehouse Considerations**
>
> This lab does not cover the creation or migration of the data warehouse. Migrating the data warehouse involves special considerations. In particular, some of the history in the data warehouse cannot currently be migrated to a different database, though some can be re-created after migration.
>
> Take care when migrating the data warehouse to a new database and understand the repercussions.

__5. Update teamserver.properties.

__a. Go to **C:\AdminWS\IBM\JazzTeamServer\server\conf**. Notice there are directories for the CLM products, in particular CCM, JTS, and QM.

__b. Repeat the steps below for JTS, CCM, and QM:

__i. Open the teamserver.propertes files in each application folder for editing.

__ii. Comment out the lines that contain the indicated text.

```
# com.ibm.team.repository.db.vendor = DERBY
# com.ibm.team.repository.db.jdbc.location=...
# com.ibm.team.datawarehouse.db.vendor=...
# com.ibm.team.datawarehouse.db.jdbc.location=...
# com.ibm.team.datawarehouse.db.net.port=... (this line may not be in all files)
```

__iii. Copy and paste the following lines into the bottom of the teamserver.properties file. Replace **myDB** with the name of the DB2 database you created earlier: JTS, CCM, or QM.

```
com.ibm.team.repository.db.vendor=DB2
com.ibm.team.repository.db.jdbc.location=//clm.admin.ws:50000/myDB:user=db2admin;passwo
rd={password};
com.ibm.team.repository.db.jdbc.password=db2admin

com.ibm.team.datawarehouse.db.vendor=DB2
com.ibm.team.datawarehouse.db.jdbc.location=//clm.admin.ws:50000/DW:user=db2admin;passw
ord={password};
com.ibm.team.datawarehouse.db.jdbc.password=db2admin
com.ibm.team.datawarehouse.db.base.folder=C:\\AdminWS\\jazzdw
com.ibm.team.datawarehouse.report.user=RPTUSER
```

Important Warehouse Information

Note the db.base.folder property was changed because it now needs to be a folder on the databse server. If it doesn't exist there will be issues later when the data warehouse is set up. We used double-backslashes because this will be a new directory.

__iv. The index locations are currently relative paths. They must be changed to absolute paths. Change the following lines, inserting jts, qm, or ccm in place of **APP** (note the forward slashes "/"):

```
com.ibm.team.fulltext.indexLocation=C:/AdminWS/IBM/JazzTeamServer/server/conf/APP/indices/workitemindex
com.ibm.team.jfs.index.root.directory=C:/AdminWS/IBM/JazzTeamServer/server/conf/APP/indices
```

__v. Save and close the **teamserver.properties** file.

__6. Populate the New Databases (import).

It will take 15-30 minutes to import the data

While you're waiting, you can take a look at the world famous San Clemente Beach and Panorama Cams.

You can also browse the remarkably useful Jazz Jumpstart team blogs. Together they cover the breadth and depth of CLM applications and platforms.

- Jim Ruehlin's Blog
- Ralph Schoon's Blog
- Dan Toczala's Blog
- Rosa Naranjo's Blog
- Robin Yehle's Blog
- Boris Kuschel's Blog
- Dave Chadwick's Blog
- “Freddy” Frederick's Blog
- Stephane Leroy's Blog
- Philippe Krief's Blog
- Jorge Diaz's Blog

If you feel like pressing forward, you can begin work on the next section, Migrating to WAS ND, as long as you check back on your import and validate the import once it has completed.

__a. Return to the regular command prompt you have open, and navigate to **C:\AdminWS\IBM\JazzTeamServer\server**.

__b. Run the following command (enter “y” if prompted to continue):

```
repotools-jts -import fromFile=JTSData.tar
```

Shrink the Database?

If you have plenty of disk space, you do not need to reduce the size of the databases after import. If you have limited space, for example if you are running the workshop in a Cloud instance, you will probably need to reclaim disk space after importing.

The DB reduction steps after each import saves approximately 6GB of space (total). You should reduce the database sizes if you have any concerns about your disk space.

You can also delete the DB2 download and extraction directory in the C:\AdminWS\Downloads folder, which frees up approximately 1GB of disk space.

__c. Reduce the size of the JTS database. Return to the DB2 Command Editor window and enter the following:

```
connect to JTS
ALTER TABLESPACE CONTENTTS RESIZE (FILE
'C:\DB2\NODE0000\SQL00001\jazzdata' 65536)
disconnect JTS
```

__d. Return to the regular command prompt window and run the following command (enter “y” if prompted to continue);

```
repotools-qm -import fromFile=QMData.tar
```

__e. Reduce the size of the QM database. Return to the DB2 Command Editor window and enter the following:

```
connect to QM
ALTER TABLESPACE CONTENTTS RESIZE (FILE
'C:\DB2\NODE0000\SQL00003\jazzdata' 120000)
disconnect QM
```

__f. Return to the regular command prompt window and run the following command (enter “y” if prompted to continue);

```
repotools-ccm -import fromFile=CCMData.tar
```

__g. Reduce the size of the CCM database. Return to the DB2 Command Editor window and enter the following:

```
connect to CCM
ALTER TABLESPACE CONTENTTS RESIZE (FILE
'C:\DB2\NODE0000\SQL00002\jazzdata' 65536)
disconnect CCM
```

__7. Health Check: Verify the database and data.

__a. Run **server.startup**.

__b. Navigate to https://clm.admin.ws/jts/admin

__c. Login as adminws/adminws

__d. Select the **Manage Server** link

__e. On the Server Administration screen, select **Database Connection**.

Verify the JDBC vendor is DB2, and the JDBC Location line includes “user=db2admin”.

__f. Select the down-arrow next to the Home button and select **JKE Banking (change management)**. You may need to select the link **Login to view this content**.

__g. Verify the dashboard has no errors in the display of work items.

Reporting Errors are OK

We have not set up the Data Warehouse, so there is no reporting information available. However, there are some viewlets on the dashboard that display report details. You can ignore these errors.

Viewlets that display simple queries or lists of work items should display normally.

__h. Drop down the Home menu again and select **JKE Banking (Requirements Management)**.

__i. Verify the dashboard has no errors.

__j. Drop down the Home menu again and select **JKE Banking (Quality Management)**

__k. Verify the dashboard has no errors.

2.3 Migrate from Tomcat to WAS ND

You will now migrate from the Tomcat server to the more robust WebSphere Application Server (WAS). WAS offers benefits in administration, monitoring, security, and high availability. For more information on the performance between the two application servers, see Case Study: Examining Rational Team Concert Performance with WebSphere Application Server and Tomcat.

__1. Set User ID case insensitivity to be the same between CLM and WAS ND.

> **Case Sensitivity and External user Registries**
> By default, CLM matches user IDs in external registries in a case-sensitive way. WAS ND matches user IDs in a case-insensitive way. For the purposes of the workshop we'll assume everything case-insensitive, so we need to change CLM to match WAS ND.

__a. Navigate to https://clm.admin.ws/jts/admin

__b. Select **Server** on the top of the screen

__c. Select **Advanced Properties** on the left-hand side of the screen.

__d. Locate the property **com.ibm.team.repository.service.internal.ContributorService**

__e. For the property **Use case insensitive user ID matching**, change the value to **true**.

com.ibm.team.repository.service.internal.ContributorService — Preview

Property	Current Value	Default Value
Use case insensitive user ID matching	true	false

__f. Scroll to the top of the window and select **Save**.

__2. Stop the Jazz Team Server by running **server.shutdown.bat**.

__3. Backup data and configuration information.

__a. Create the following folders in the file system:

__i. C:\AdminWS\backup\jts_conf

__ii. C:\AdminWS\backup\ccm_conf

__iii. C:\AdminWS\backup\qm_conf

__iv. C:\AdminWS\backup\rm_conf

__v. C:\AdminWS\backup\admin

__vi. C:\AdminWS\backup\war

__b. Return to the DB2 Command Line Processor window and enter the following commands to backup the databases:

```
backup database JTS user db2admin  using db2admin to c:\adminws\backup COMPRESS
backup database CCM user db2admin  using db2admin to c:\adminws\backup COMPRESS
backup database QM user db2admin  using db2admin to c:\adminws\backup COMPRESS
backup database DW user db2admin  using db2admin to c:\adminws\backup COMPRESS
```

__c. Close the DB2 Command Line Processor window.

__d. Copy all **.properties, *.rdf,* and **.xml* files from the application folders (jts, ccm, qm, rm, and admin) in **C:\AdminWS\IBM\JazzTeamServer\server\conf** to the application folders you created in **C:\AdminWS\backup**. Note that rm and admin have no teamserver.properties file.

__e. Copy the following WAR files from **C:\AdminWS\IBM\JazzTeamServer\server\tomcat\webaps** to **C:\AdminWS\IBM\backup\war**:

__i. admin.war

__ii. ccm.war

__iii. clmhelp.war

__iv. converter.war

__v. jts.war

__vi. qm.war

__vii. rm.war

__f. Copy the directory **C:\AdminWS\IBM\JazzTeamServer\repotools** to **C:\AdminWS\backup**.

__4. Prepare the WebSphere Application Server for CLM Applications

__a. Select **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server... > Profiles > CLMDmgr01 > Start the deployment manager**.

__b. Select **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server... > Profiles > CLMDmgr01 > Administrative Console**.

__i. Accept and confirm any security warnings.

__ii. Login as wasadmin/wasadmin

__c. Adjust server ports for the CLM deployment:

__i. Select **Servers > Server types > WebSphere Application servers > server 1**

__ii. Select **Ports** under Communications.

__iii. Select **WC_defaulthost** and replace the current value (9080) with **80**, and click **OK**

__iv. Select **WC_defaulthost_secure** and replace the current value (9443) for **443**, and click **OK**

☐	WC_defaulthost	*	80	View associated transports
☐	WC_defaulthost_secure	*	443	View associated transports

__v. Select **Save directly to the master configuration.**

What Did I Just Do?

You're changing the ports for the same reason you changed the Tomcat ports in Lab 1. Using the default ports will allow us to move CLM into a reverse proxy in Lab 3. If you don't install CLM directory into a reverse proxy when you first run setup, or if you don't use these default ports, you won't be able to move CLM into a reverse proxy at a later time.

Keep this in mind as you deploy your own implementations. Choosing carefully will give you flexibility in your ability to scale in the future.

__d. Assign JVM settings for CLM.

__i. Select **Servers > Server types > WebSphere Application servers > Server 1**.

__ii. Under **Server Infrastructure**, select **Java and Process Management > Process Definition**.

__iii. Under **Additional Properties** select **Java Virtual Machine**, and make the following settings:

__a. Initial Heap: 100MB

__b. Maximum Heap Size: 4096MB

> **JVM Settings**
> The figure here is only a suggestion; set the value according to your environment. A typical medium-size team can use a value of 4096 MB, providing 4 GB of heap memory for the Jazz Team Server process on a 64-bit computer.

__c. **Apply** and **Save directly to the master configuration**.

__iv. Add custom properties.

__a. Select **Java Virtual Machine > Custom Properties** (under Additional Properties).

__b. Select **New**.

__c. Name: JAZZ_HOME

__d. Value: file:///C:/AdminWS/IBM/JazzTeamServer/server/conf

> **Three slashes?**
> Yes, you use three slashes at the beginning of the file path.

__e. Select **OK**.

__f. Using the same procedure as steps a-e, add these 3 additional custom properties.

__g. Name: java.awt.headless, Value: true

__h. Name: org.eclipse.emf.ecore.plugin.EcorePlugin.doNotLoadResourcesPlugin, Value: true

__i. Name: log4j.configuration, Value: file:///C:/AdminWS/IBM/JazzTeamServer/server/conf/startup_log4j.properties

__j. Select **Save directly to the master configuration**

__e. Log out of the Admin console by selecting the **Logout** link.

__5. Configure session management parameters:

__a. Select **Servers > Server types > WebSphere Application servers > Server 1**.

__b. Select **Container Settings > Session Management**

__c. Select **Custom Properties** under **Additional Properties**

__d. Select New and add the following property:

__i. Name: InvalidateOnUnauthorizedSessionRequestException

__ii. Value: true

__e. Select **OK** and **Save directly to the master configuration**

Why are you configuring this property?

There is a know defect in the invalidation of sessions when a user logs out of an application in a WAS server that hosts several applications that use security integration.

For more information check the following technote: PM59861

__6. Enable Security

__a. Navigate to the **Security > Global security** page

__b. In the Authentication section, select **Web and SIP security > General settings**.

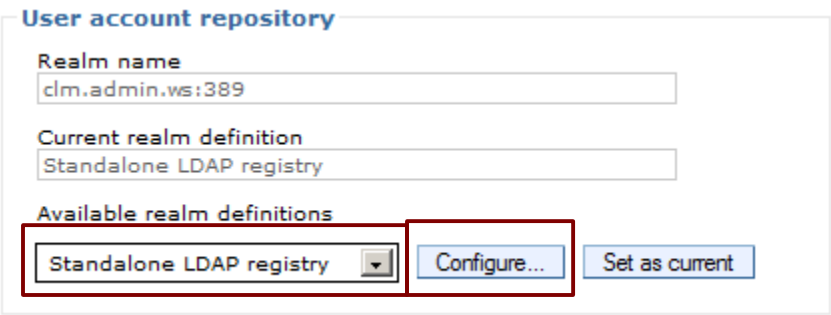
__c. Make sure that *Use available authentication data when an unprotected URI is accessed* is selected. If you change this value, select **Apply** and **Save directly to the master configuration**

__d. Assure the security settings are correct for the server.

__i. Under Java 2 Security, clear the checkbox for **Use Java 2 security to restrict application access to local resources**.

__ii. Make sure both **Enable administrative security** and **Enable application security** checkboxes are selected. If you change any values select **Apply** and **Save directly to the master configuration**.

In the **User account repository** section choose **Standalone LDAP Registry** and click **Configure** and provide the required information.



__iii. Set **Primary administrative user name** to `wasadmin`.

__iv. Set **Type of LDAP server to Microsoft Active Directory**

__v. Set **Host** to **clm.admin.ws**

__vi. Set **Port** to `389`

__vii. Set **Server user identity** to **Automatically generated server identity**

__viii. Set **Base distinguished name (DN)** to **`dc=clm,dc=admin,dc=ws`**

__ix. Set **Search timeout** to **120 seconds**

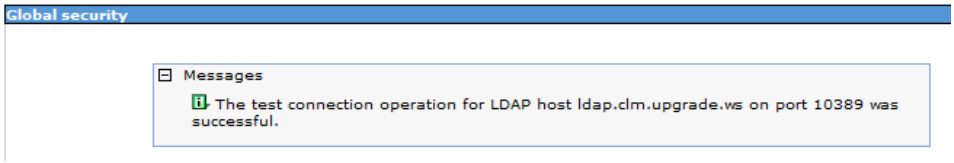
__x. Make sure **Ignore case for authorization** is checked (this will match the change we made earlier to JTS to ignore case).

__xi. Set **Bind distinguished name (DN)** to: **cn=adminws,cn=Users,dc=clm,dc=admin,dc=ws**

__xii. Set **Bind password** to **adminws**

__e. In the **Configuration** section, click **Test connection**.

__f. Make sure the connection succeeded



__g. Click **Apply** and **Save directly to the master configuration**.

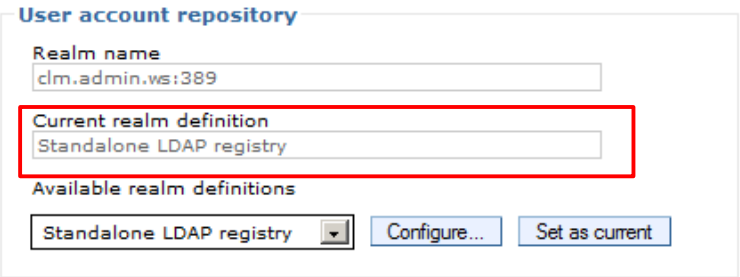
__h. Select **OK**.

__7. Activate the LDAP registry you have just configured:

__a. Navigate back to the **Security>Global Security** page

__b. Make sure that in the **User account repository** section you choose **Standalone LDAP Registry** and click **Set as current.** Then click **Apply** and **Save directly to the master configuration**.

__c. Check that Current Realm Definition is set to Standalone LDAP Registry.



Make sure the Standalone LDAP registry is active

Please check if your configuration succeeded and is really set as shown in the image below.

If the screen shows an error, fix the error before continuing.

__8. Force synchronization of the Node:

__a. Open a command prompt and navigate to **C:\Adminws\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin**

__b. Run the following command:

```
syncNode clm.admin.ws 8879
```

Why are we doing this?

Once we have configured security we have to send a copy of the new configuration to all the node agents to make them “security-enabled”. You can force a synchronization in the console navigating to **System Administration > Nodes** and clicking **Full resynchronize** for each node.

In this case we are using the command line because the node agent is still stopped in this environment so no automatic synchronization is possible. In case you started the node before instructing in this lab steps you will need to issue *stopNode* command prior to successfully running *syncNode*.

For more information review the information center topic: Enabling security for the realm

__c. If asked, login with wasadmin/wasadmin

__9. Restart the deployment manager process: for the new security configuration to take effect, we have to restart the process.

__a. Select **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server... > Profiles > CLMDmgr01 > Stop the deployment manager**

__b. When asked, login as wasadmin / wasadmin

__c. When the stop completes (the pop-up window closes), start the deployment manager again selecting **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server... > Profiles > CLMDmgr01 > Start the deployment manager**

__10. Deploy CLM into WAS

__a. Select **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server... > Profiles > CLMDmgr01 > Administrative console**

__b. Login as wasadmin / wasadmin

__c. Select **Applications > New Application > New Enterprise Application**.

__d. Select **Remote file system**, **Browse**..., then **CLMCellManager01**. Then browse to **C:\AdminWS\IBM\JazzTeamServer\server\tomcat\webapps**.

__e. Select **admin.war**, and select **OK**. Select **Next**.

__f. Select **Next** on each page, accepting the defaults, until you reach **Step 3: Map virtual hosts for Web models**. Select the box next to **admin.war**, then select **Next**.

__g. In **Step 4: Map context roots for Web modules**, enter **/admin** for the Context Root, then select **Next**, then select **Finish**.

__h. Verify the text *Application admin_war installed successfully* is displayed, then select **Save directly to the master configuration**.

__i. Repeat steps b through h for the rest of the CLM applications: ccm.war, clmhelp.war, converter.war, jts.war, qm.war, and rm.war. The root contexts for these applications are /ccm, /clmhelp, /converter, /jts, /qm, /rm.

__11. Map security roles

Security Roles

We must map security roles from the CLM applications to LDAP groups. Jazz has 5 security roles and we already set up Active Directory with those same role names in Lab 1. So we just need to map from one to the other.

__a. Select **Applications > Application Types > WebSphere enterprise applications**.

__b. Select the link for **jts.war**.

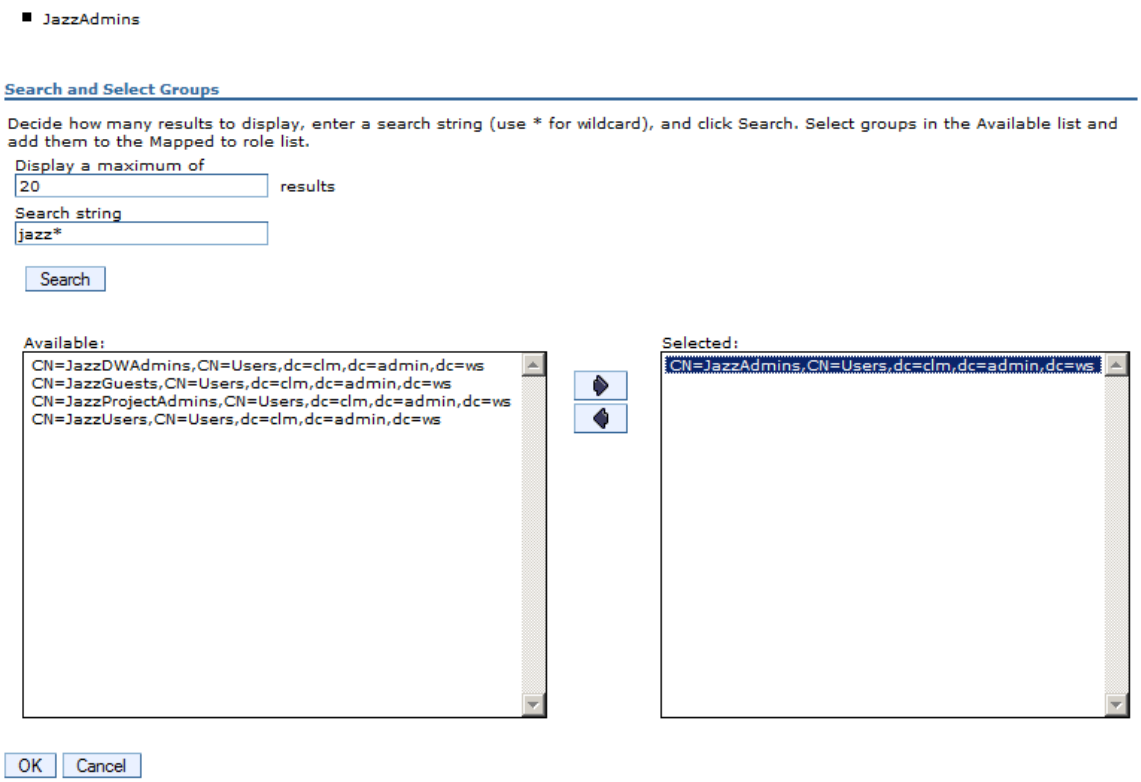
__c. Under Detail Properties, select **Security role to user/group mapping**.

__d. Map the security groups

__i. Select **JazzAdmins**, then **Map Groups**.

__ii. Enter **jazz*** as the search string and select **Search**. You should see the 5 Jazz groups displayed.

__iii. Select the line starting with **CN=JazzAdmins...**, then select the **right-arrow** to add that group to the Selected category. Then select **OK**.



__iv. Repeat this step for the other four groups, assigning JazzDWAdmins to JazzDWAdmins, JazzUsers to JazzUsers, etc.

__v. Select **OK**, then select **Save directly to the master configuration**.

__e. Repeat this step for these WAR files: ccm.war, qm.war.

__12. Start the node and the applications:

__a. Open a window to **C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin**

__b. Run **startNode.bat** and wait to the pop-up window to close.

__c. Go back to the administrative console (http://clm.admin.ws:9060/ibm/console), and navigate to **Servers > Server Types > WebSphere application servers**.

__d. Select the box next to **server1**, then select **Start**.

Taking a while to start?

This first time the start up process will take some time as the applications' configuration are being transferred from the deployment manager to the node, along with the applications' binaries.

It's not working!

Try re-synching the server if the applications don't start. To do this select **System Administration > Nodes**. Select **CLMNode01**, then select **Full Resynchronize**.

__e. Go to **Applications > Application Types > WebSphere enterprise applications**. Make sure all the applications are started, with green arrows in the Application Status column.

__13. In a new browser tab, navigate to https://clm.admin.ws/jts/admin. Confirm and add a security exception if necessary.

… but I don't want to log in as wasadmin!

Surprise! CLM is telling you that wasadmin is not allowed to log in as a JTS administrator. This is because you're already logged in as wasadmin as a result of logging into the WAS Administration Console. So all the applications in your node are obediently trying to log in as the current user.

One way to avoid this is to log out of the WAS Administration Console. Then you can log into CLM as a user that CLM recognizes. But when you go back to the WAS Administration Console, you'll need to log out of CLM so you can log into the WAS console as wasadmin.

Normally you wouldn't want to make your wasadmin account the administrator of both WAS and CLM. But in this case, both administrators are the same person (you). And it doesn't teach you much to make you log in and out of CLM and WAS for the whole workshop. So for convenience sake, we'll make wasadmin a JTS administrator too.

Another advantage of doing this in the workshop is to show you one way to import LDAP users into CLM.

__14. Add wasadmin as a JTS administrator

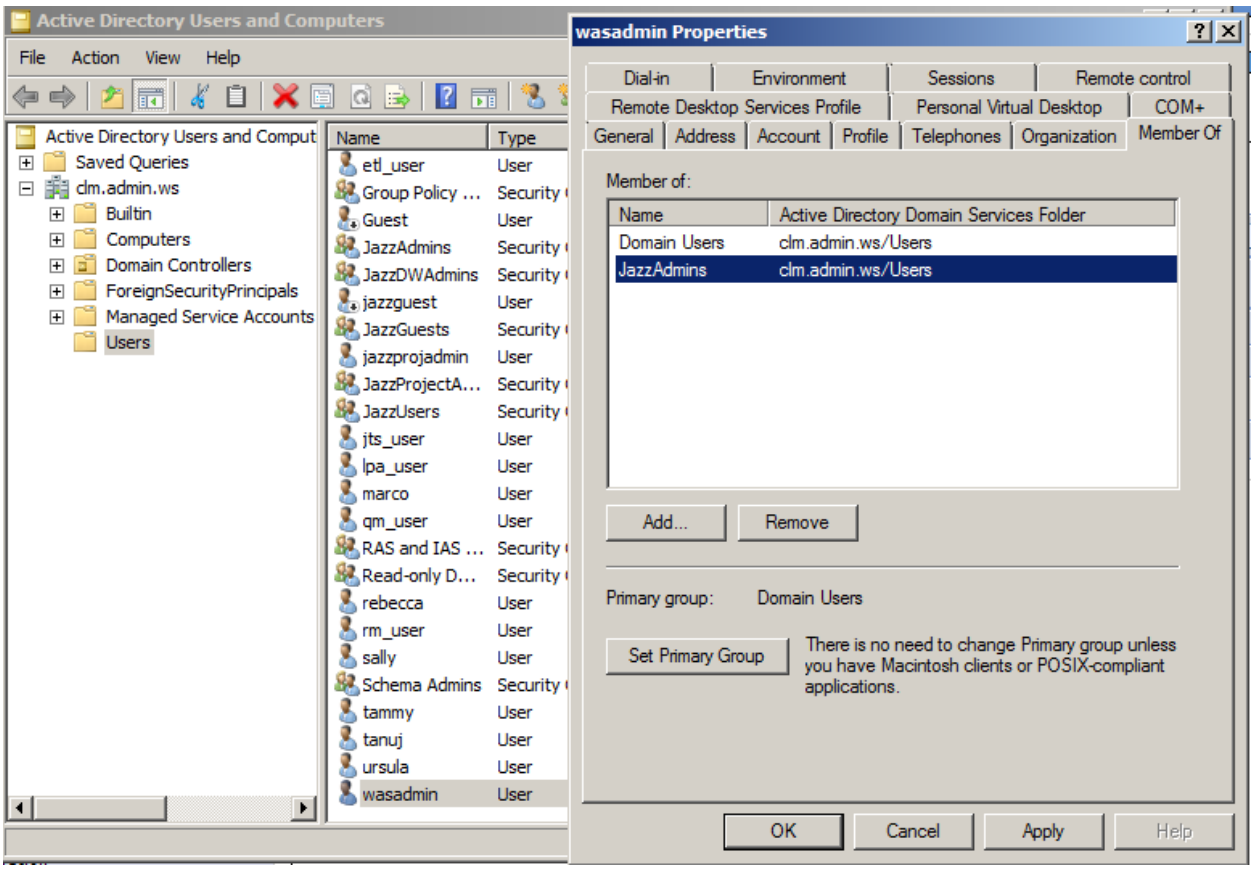
__a. Open **Start > Administrative Tools > Active Directory Users and Computers**.

__b. Select the **Users** folder and scroll down to the wasadmin user. Double-click on **wasadmin**.

__c. Select the **Member Of** tab.

__d. Select **Add**, and enter **jazzadmins** in the object names field. Select **Check Names** and JazzAdmins should display in the field. Select **OK**.

__e. Select **JazzGuests** and select **Remove**. Confirm the removal.



__f. Select **OK**

__g. Close the Active Directory window.

__h. Logout of the WAS Admin Console.

__i. Go to https://clm.admin.ws/jts/admin and login as adminws/adminws.

__j. Go to **Users > Active Users**.

__k. Select **Import Users** in the upper-right corner of the window.

__l. In the search box, enter **wasadmin** and select **Search**. It will find the wadadmin user. Select that user and select the **Select** button. Select **OK**, and you'll see the green status at the top of the screen that says *Users imported successfully*.

__m. Log out of CLM, and log into the WAS Admin Console as wasadmin/wasadmin.

__n. Go to https://clm.admin.ws/jts/admin. Now you will automatically log in as wasadmin, because you're already logged in as wasadmin in the WAS Administration Console.

__15. Health Check: Verify CLM is running under WAS and using the LDAP user registry.

__a. Log out of the WAS administration console

__b. Navigate to https://clm.admin.ws/ccm

__i. Login as bob/bob

__c. Go to JKE Banking (Change Management) and assure the dashboard is correct

2.4 Summary

In this lab you upgraded from an existing Evaluation topology to a Departmental topology. This Departmental topology will support more people, projects, and data. It will also support a more complex organization. You set up access to a corporate LDAP user registry, and provided your users with a single sign on (SSO) experience. You migrated your repositories from the lightweight Derby based database storage to an Enterprise ready DB2 database. You also configured the WebSphere Application Server ND as your application server, and replaced the existing Tomcat application server.

In short, you were able to migrate your Jazz infrastructure from evaluation platforms (Derby, Tomcat, application specific identity management), to more Enterprise ready platforms (DB2, WAS, and LDAP).

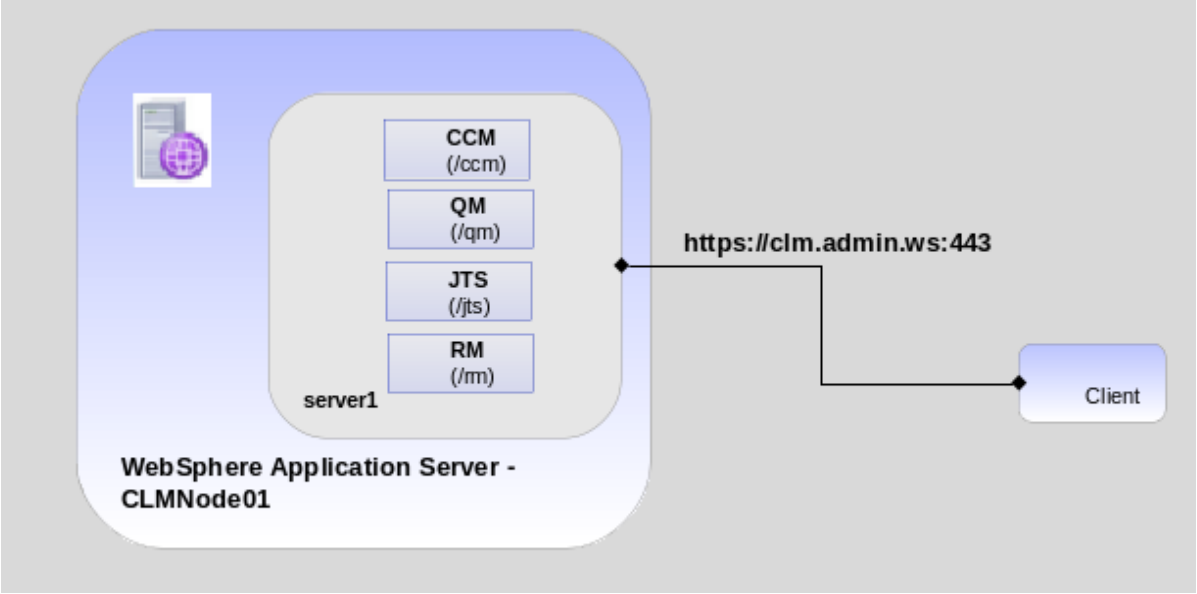
Lab 3 Configuring a reverse proxy for the CLM Installation

In this lab you will configure a reverse proxy with the IBM HTTP Server into your existing Departmental Topology.

As your team needs grow, your CLM installation architecture needs to evolve to be able to accommodate new requirements. You need to define an IT architecture that can grow in the future with no impact to the users. Throughout labs 1 and 2 of this workshop, the IT architecture has grown from the basic Evaluation topology to a Departmental one, where we the users are accessing the CLM application hosted in WebSphere Application Server with DB2 as back end database, all integrated with the corporate Active Directory service.

Now your IT department wants to include a reverse proxy to have the architecture ready for future escalation needs. This mechanism will allow you to hide the details of server deployment while maintaining the Public URI of the CLM applications. In the future, the applications can be moved to a different server or the CLM deployment topology can be changed to make it completely distributed (each CLM application in a different server), with no impact to the users, and no change to the Public URI.

Regarding the deployment of the CLM applications, our initial scenario for this lab is the following:



The clients are directly calling the CLM applications via a URL served by the application server (clm.admin.ws at port 443). All of the CLM applications are deployed in the same server and port.

Information: Public URI Planning and port 443

The default web servers' ports for serving content are 80 for HTTP and 443 for HTTPS. Web browsers will automatically try port 443 when accessing a page through HTTPS protocol without having to explicitly include the port in the URL address.

One of the key decisions for the deployment of CLM is to define a stable public URI to be used. For this workshop we decided that it would be *clm.admin.ws* using the default 443 port in order to ease user access and an to provide for future growth.

This public URI definition will leverage the operations to be performed in the rest of this workshop.

The steps that we will follow are:

1. Set up a reverse proxy with IHS (IBM HTTP Server) and WAS ND
2. Configure CLM applications to make use of the proxy
3. Sample scenario: move JTS to a different server while maintaining the Public URI

Lessons Learned:

- Configure a reverse proxy with IHS for CLM

3.1 Set up a reverse proxy with IHS (IBM HTTP Server) and WAS ND

You will perform the configuration of IHS to serve as reverse proxy to our WebSphere Application Server ND installation:

__1. Configure a new Web Server Virtual Host for our IHS installation. The Virtual Host will use a personal certificate for secure communication with the server:

> **Information: what is a virtual host?**
> A virtual host is a configuration enabling a single host machine to resemble multiple host machines. It consists of a host alias or aliases, which consist of a host name and a port number. When you install an application, you can associate a virtual host with each Web module in the application. By associating a virtual host with a Web module, requests that match the host aliases for the virtual host will be processed by servlets/JSPs in this Web module.
>
> For more information refer to virtual hosts in Websphere Application Server Infocenter.

__a. Start WAS ND if not already running:

__i. Select **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server... > Profiles > CLMDmgr01 > Start the deployment manager**

__b. Start the Node Agent. We need it running so we can manage the resources of the node's servers from the Administrative Console.

__i. Open a window and navigate to **C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin**.

__ii. Double-click **startNode.bat**

__c. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**.

__d. Accept and confirm any security warnings.

__e. Login as wasadmin/wasadmin

__f. Make sure the server is stopped:

Information

You can perform the majority of operations while “server1” is started, and WebSphere Application Server will automatically restart the applications when their configurations change. However, when performing administrative tasks in your environment you may want to stop the server for a while (if dedicated, or stop the applications instead), and avoid exposing the user to unexpected disruptions if accessing the CLM applications during this time.

In addition, we stop the server to free up resources while working on this lab.

__i. Select **Servers > Server Types > WebSphere applications servers**

__ii. You should see a red-cross next to **server1** indicating it is stopped. Otherwise, select the checkbox next to **server1** and click **Stop**, and wait until the process finishes before continuing.

__g. Select **Servers > Server Types > Web servers**

__h. Select **clmwebserver1** server

__i. Select **Configuration settings > Web Server Virtual Hosts**, and then select **New...**

__j. Use Security enabled virtual host. Click **Next**.

__k. The *Create new security enabled virtual host* wizard opens:

__i. In *Step 1:* **Specify key store properties**, use the following values:

__a. Key store file name: **clmwebserver1**

__b. Target key store directory: <keep the default value>

__c. Key store password: **secret**

__d. Certificate alias: **clmwebcertifcate**

__e. Click **Next**.

__ii. In *Step 2:* **Specify virtual host properties**. Select **Next**.

__a. IP address: **0.0.0.0** (i.e. all on this host):

__b. Port: **443**

__iii. Check the summary and click **Finish**.

__iv. Select **Save directly to the master configuration.**

__l. Check the configuration performed and copy the self-signed certificate:

__i. Select **clmwebserver1** server

__ii. Navigate to **Configuration Settings > Global Directives***:*

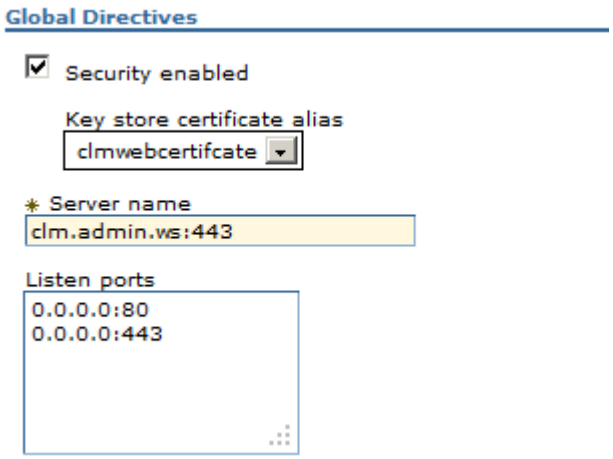
__iii. Make sure that the in the Listen Port box **0.0.0.0:443** is included, and that the server name is **clm.admin.ws:443.** It is also important to have the **Security enabled** checked, and that the self signed certificate we created in previous step (*clmwebcertificate*), is being used.

(If any information is wrong, just modify it and click **Apply**).

Mapping ports

You will see in your configuration the default "0.0.0.0:80" listen ports mapping. You can remove it as our IHS installation will only be serving requests for CLM and will only be listening on the secure 443 port.

In this case we are leaving that port, so calls to IHS in port 80 will be redirected to the secure port 443 automatically.



__iv. Click on **Copy to the Web server key store directory.** You should see a message notifying the copy was successful:

Messages

Keystore files clmwebserver1.kdb and clmwebserver1.sth in directory C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMDmgr01\config\cells\CLMCell01\nodes\CLMNode01\servers\clmwebserver1\ have successfully been propagated to target WebServer location C:/AdminWS/IBM/HTTPServer/conf/clmwebserver1.kdb and C:/AdminWS/IBM/HTTPServer/conf/clmwebserver1.sth. The webserver must be restarted for changes to take effect.

__2. Make sure that IHS configuration loads the WAS plugin and libraries

__a. Navigate to **Server > Server Types > Web Servers > clmwebserver1**

__b. Navigate to **Additional Properties > Configuration File**

__c. Add the following lines at the end of the configuration file:

```
LoadModule was_ap22_module
C:\AdminWS\IBM\WebSphere\Plugins\bin\32bits\mod_was_ap22_http.dll


WebSpherePluginConfig
C:\AdminWS\IBM\WebSphere\Plugins\config\clmwebserver1\plugin-
cfg.xml
```

For more information of the meaning of these options check the information center topic [Configuring IBM HTTP Server Version 8.0]

__d. Click **OK**

__3. Reconfigure the ports for the WAS server. Since the IHS will be serving requests for our CLM installation and it resides in the same node as our server, we have to free the 80 and 443 ports that we have configured to be used by the Public URI:

__a. Select **Servers > Server Types > WebSphere applications server > server1**

__b. Select **ports**

__c. Select **WC_defaulthost** and replace the current value (80) with the default value **9080**, and click **OK**

__d. Select **WC_defaulthost_secure** and replace the current value (443) with the value **9443**, and click **OK**

__e. Select **Save directly to the master configuration.**

☐	WC_defaulthost	*	9080	View associated transports
☐	WC_defaulthost_secure	*	9443	View associated transports
Total 18				

At this point, we have created the configuration of the Web Server that we will use as proxy server by means of a virtual host definition. We have created a self-signed certificate to be used by this Web Server, and we have configured the communication between WebSphere Application Server and our installation of IBM HTTP Server loading the required libraries in the configuration file

Don't Start the Server Yet!

We are introducing IHS as the proxy server in our installation in order to maintain a stable Public URI. We haven't bound the applications to the IHS server yet.

3.2 Configure CLM applications to make use of the proxy

For now, we have the CLM applications deployed in our WAS server and we have configured the IHS to communicate with the server installation.

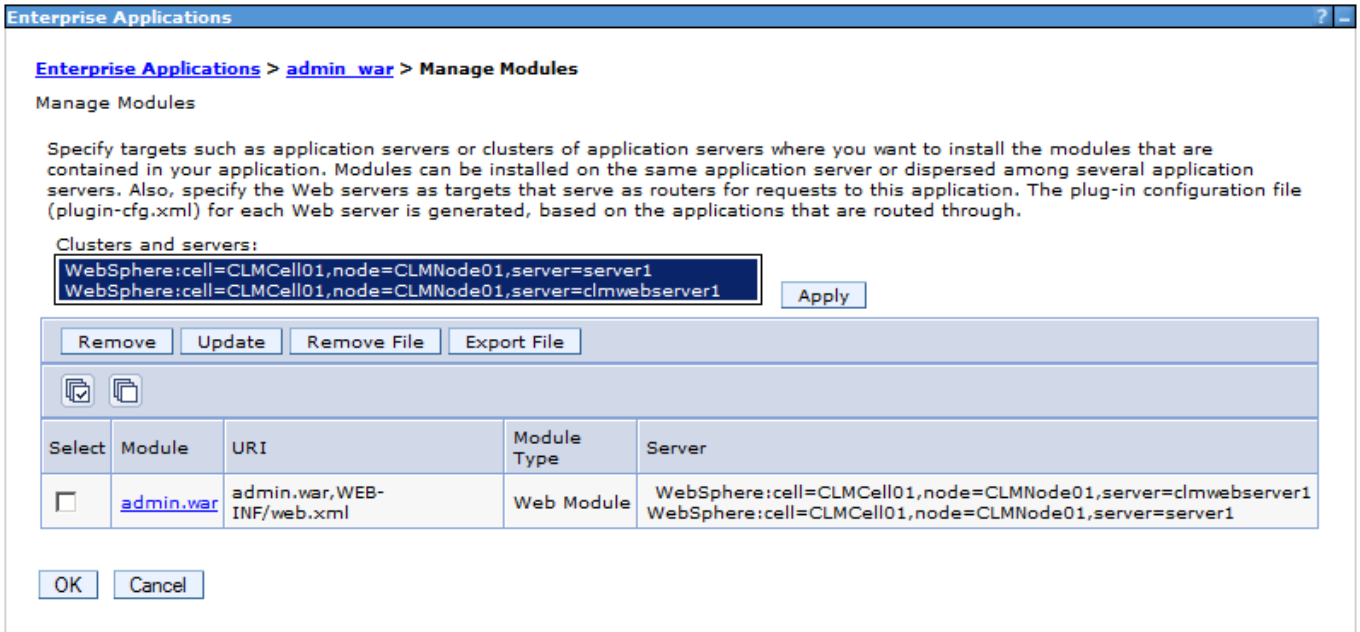
Now we are going to reconfigure the CLM applications so they are deployed in the IHS Web Server to successfully route the requests:

__1. Select **Applications > Application Types > WebSphere enterprise applications**

__2. Modify the applications' modules mapping:

- __a. Click on **admin_war**
- __b. Select **Manage Modules** under **Modules**
- __c. Highlight **server1** and **clmwebserver1** (both), within Clusters and Servers box
- __d. Check the box next to the module (admin_war), and select **Apply**

> **Make sure that you click APPLY**
> In many of these steps you will need to make sure that you click **APPLY**. Just directly clicking on OK will not perform configuration changes needed.



__e. Click **OK.**

__f. Select **Save directly to the master configuration**

__g. Repeat the operation for the rest of the modules: **ccm_war**, **clmhelp_war**, **converter_war**, **jts_war**, **rm_war** and **qm_war**

> **A Quick Word on the CLM Help Application**
> In this deployment you will see the CLM Help application. This application provides a web based version of the Infocenter content that can be found up on the IBM website.
>
> If you want to have the latest and greatest information, do not deploy this application, and instead point your users to the online IBM infocenter.
>
> If you have corporate firewalls, or would prefer that your users not have to access outside websites, then make sure to deploy this application so your users can refer to the contents of the local Infocenter documentation for help.

__3. Update the Web Server Plug-in:

__a. Navigate to **Servers > Server Types > Web Servers**

__b. Select **clmwebserver1** and click **Generate Plug-in**

__c. Select **clmwebserver1** and click **Propagate Plug-in**

> **Information**
> It is a good practice to regenerate the Web Server Plug-in when a change in the application server's configuration is performed.
>
> This Plug-in configuration file is loaded and read by IHS (we configured that communication in section 3.1), and allows WAS to set specific configuration parameters to the HTTP Server.
>
> In this case, it is also necessary to let the IHS know of the serving applications.

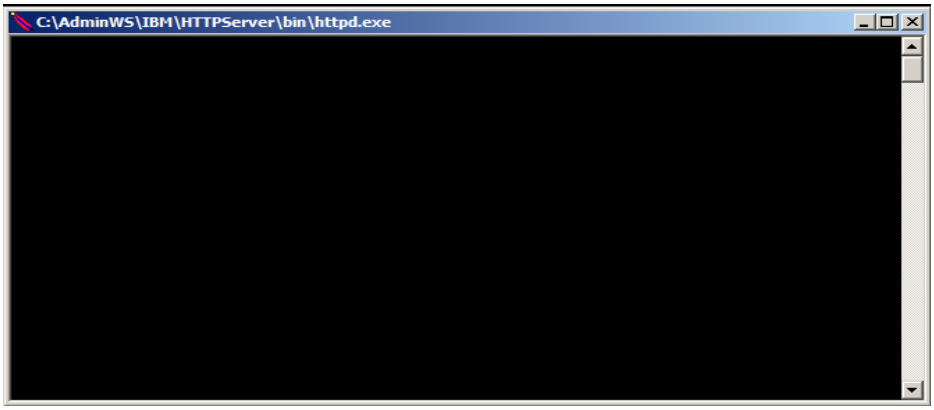
__4. Start the IHS:

__a. Open an explorer window and navigate to **C:\AdminWS\IBM\HTTPServer\bin**

__b. Double-click **httpd.exe**.

DO NOT CLOSE THAT WINDOW!
A black screen window after clicking httpd.exe indicates that the HTTP Server is running.

DO NOT CLOSE IT!! Closing it will stop the IHS service.



__5. Start the server:

__a. Go to the web browser and navigate to the WAS Administrative Console:

__i. You can automatically open a browser to the console if clicking on **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**

__b. Navigate to **Servers > Server Types > WebSphere applications servers**

__c. Select the check box next to **server1**

__d. Click **Start**

The Order is Important!

The IBM HTTP Server is now managing the Public URI, and the CLM applications are running within the server at port 9443. The order we are following for starting up the services is:

1. Start IHS
2. Start WAS “server1” server

By starting the services this way, we will allow the CLM applications to locate themselves when calling *https://clm.admin.ws/<app>/*scr. The reverse proxy will be managing the URL calls and redirecting them to the appropriate CLM application.

__6. Do a health check of the installation. Now we have finished configuring the reverse proxy, let's check the status of the data:

__a. Logout of WS ND.

__b. In a browser navigate to *https://clm.admin.ws/jts*

A Quick Note on URI Stability

When configuring IHS as a reverse proxy, we changed the application server ports to 9443 to avoid collisions. However, notice that the Public URI stability (defined with no ports), is assured by the IHS proxy server.

__c. Authenticate using, for example, *adminws/adminws*

__d. Check the usage of the reverse proxy:

__i. Navigate to **C:\AdminWS\IBM\HTTPServer\logs**

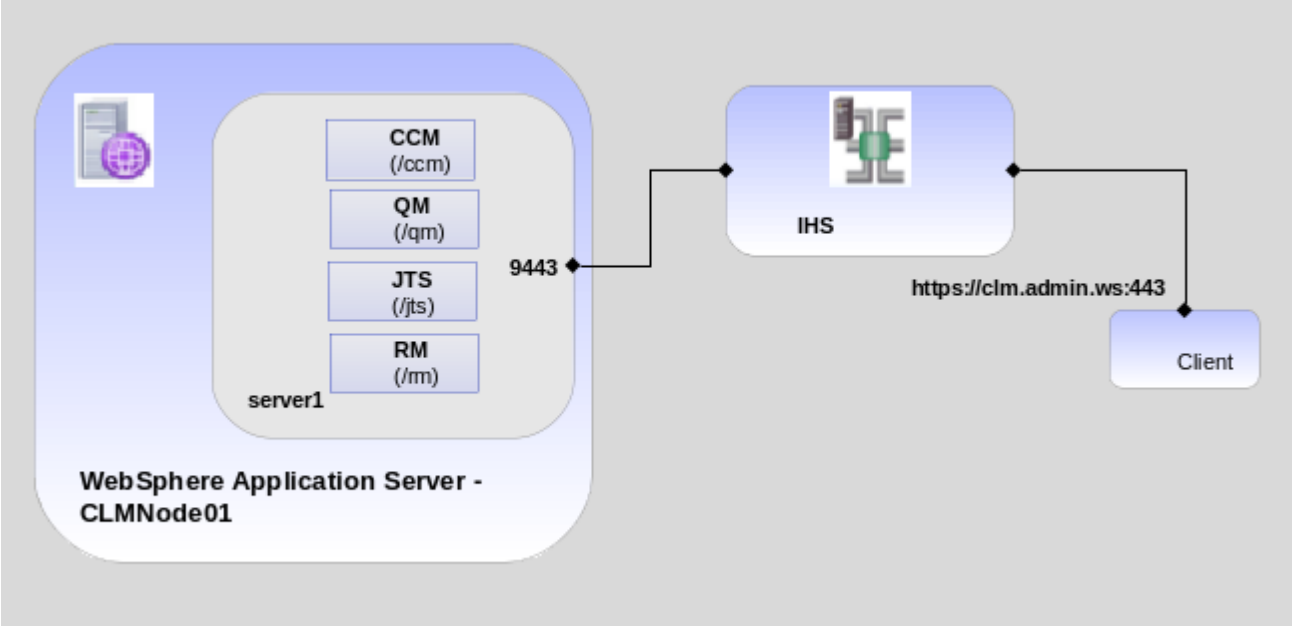
__ii. Open the file called **access.log**. You should see entries like the following, where IHS is routing the requests to the JTS:

```
"GET /jts/scr HTTP/1.1" 200 13081

"GET /jts/scr HTTP/1.1" 304 -

"GET /jts HTTP/1.1" 302 -

"GET /jts/authenticated/identity?redirectPath=%2Fjts HTTP/1.1" 302
-
```

```
"GET /jts/scr HTTP/1.1" 304 -

"GET /jts/rootservices HTTP/1.1" 200 6160

"GET
/jts/com.ibm.team.repository.service.mapping.internal.jpiMappings
HTTP/1.1" 200 244

"HEAD /jts/storage/com.ibm.team.lpa.ce9d8c65-819e-41a2-b7c9-
e6fef562fcfa HTTP/1.1" 200 -
```

__e. Once logged to Jazz Team Server, navigate to the different CLM applications to make sure that all of the data is accessible.

At this point, the IHS is managing the requests to the CLM applications Public URI.



It is important to note that our CLM applications are actually running in a port different from their Public URI (port **9443**), but the reverse proxy mechanism hides these details and makes the translation. This is the key advantage of why you want a reverse proxy in your enterprise environment. Starting from a point where you have a reverse proxy in place, you can easily change your IT topology for CLM!

Order of labs for Admin Workshop

If you are planning to try the Lab 4 of this workshop, please go ahead from this point and skip point 3.3 of this lab. Point 3.3 guides you through an example use case for taking advantage of the proxy, but it is not necessary for Lab 4.

3.3 Sample case: moving JTS to a different server (Optional)

At this point we have configured our environment to make use of a reverse proxy to hide the deployment details from the Public URI that our CLM applications use. Actually, one of the benefits of this configuration has been revealed while performing the previous steps: we changed the application server ports where the CLM is hosted, however the installation has suffered no impact as the IHS was routing the requests to the **clm.admin.ws** URI.

We are now going to make a more obvious change, moving the Jazz Team Server to a second server with different ports within our installation. The IHS proxy server will be routing requests within both servers, showing a unique Public URI for the end users.

> **This is an example**
> The case to be shown here is pretty simple, but it will demonstrate to us that applications can remain stable by means of the proxy while the topology changes.

The steps to follow are:

__1. Stop the current server and create a template:

__a. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**.

__b. Accept and confirm any security warnings.

__c. Login as wasadmin/wasadmin

__d. Stop the server components:

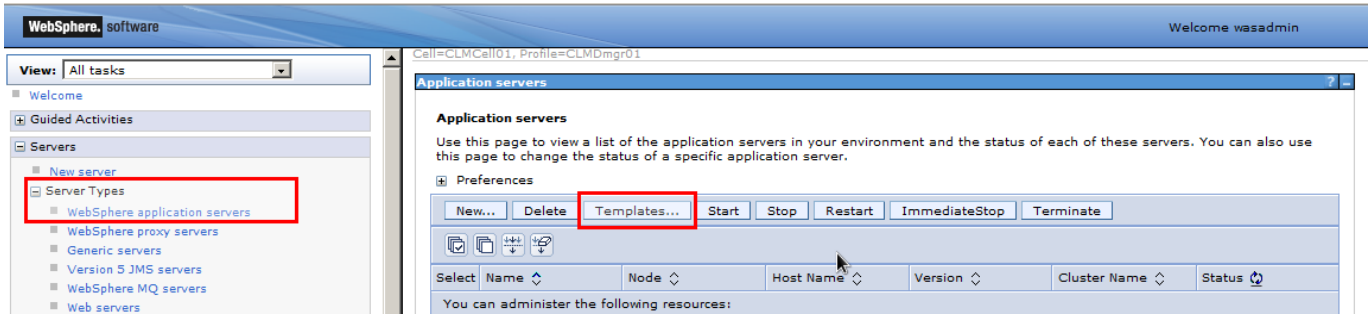
__i. Select **Servers > Server Types > WebSphere applications servers**

__ii. Select the checkbox next to **server1** and click **Stop.** Click **OK** when prompted for confirmation and wait until the process finishes before continuing.

__iii. Close the command window with the title **C:\AdminWS\IBM\HTTPServer\bin\httpd.exe**. (this is the one that we warned you about earlier in this lab)

> **Information**
> Remember just closing that window (opened when we double-clicked httpd.exe), stops IHS.

__e. Click **Templates...** within the **WebSphere applications servers** wizard.



__f. Click **New...**

__g. Select **server1** and click **OK**

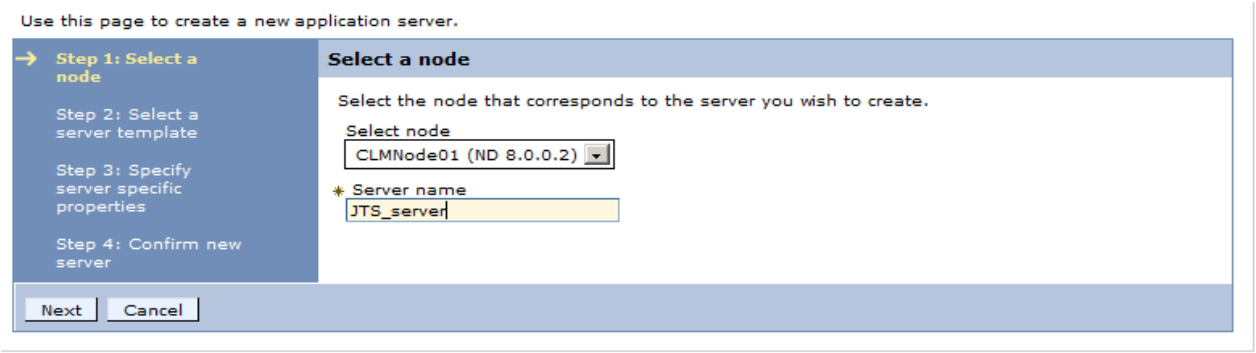
__h. Give your new template the name of **CLMServerTemplate**, click **OK** and **Save directly to the master configuration**

__2. Create a new server based on the template:

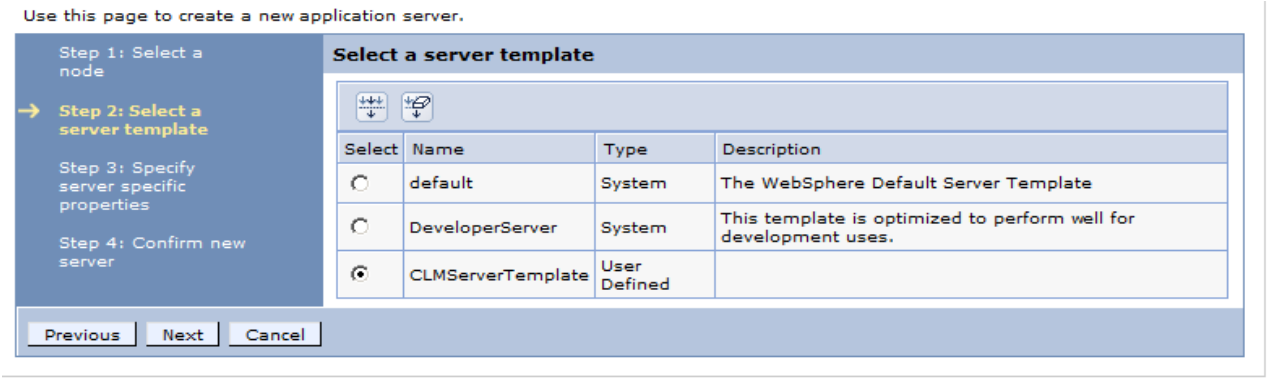
__a. Select **Servers > Server Types > WebSphere applications servers**

__b. Click **New...**

__c. For server name. use **JTS_server**. Leave the default for the node, and click **Next**



__d. Select the server template we just created to have our server populated with the CLM configuration, and click **Next**:



__e. Leave **generate unique ports** as **checked** and click **Next**, and then **Finish** in the next screen

__f. Select **Save changes to master configuration**

__3. Customize the servers: You will modify the memory settings to accommodate both servers running in our box:

Why are we changing these settings?
This is not mandatory and in a real environment were you are distributing your CLM applications the sizing will determine the memory that each server will be configured with, typically not less than 4GB. In this sample scenario we are just distributing the memory originally accommodated to the VMWare. You can also define more memory for it and keep the original JVM values.

__a. Select **Servers > Server Types > WebSphere applications servers > server1**

__b. Under **Server Infrastructure**, select **Java and Process Management > Process Definition**

__c. Select **Additional Properties > Java Virtual Machine**

__d. Lower the maximum heap size from 4096 to **2048**

__e. Click **OK** and **Save directly to the master configuration**

__f. Select **Servers > Server Types > WebSphere applications servers > JTS_server** and repeat steps b – e for this server too.

__4. Add the ports to the virtual host. To make the scenario easier, we will reuse the “default_host” virtual host

__a. In WebSphere Administration Console, select **Environment > Virtual Hosts**

__b. Select **default_host**

__c. Select **Host Aliases**

__d. Click **New...**

__e. Set * as the **Host Name** and **9444** as the **port**

__f. Click **OK** and **Save directly to the master configuration**

Checking Ports

You can actually check the ports of the new server if you navigate to **Servers > Server Types > WebSphere applications servers > JTS_server**, and click on **Ports.**

Your “server1” had assigned 9443 for secure communications (WC_default_secure). When creating a new server (“JTS_server”), WAS assigns the next available port for each type of service, in this case 9444 for WC_default_secure service which is used for HTTPS communications.

__5. Deploy JTS in second server:

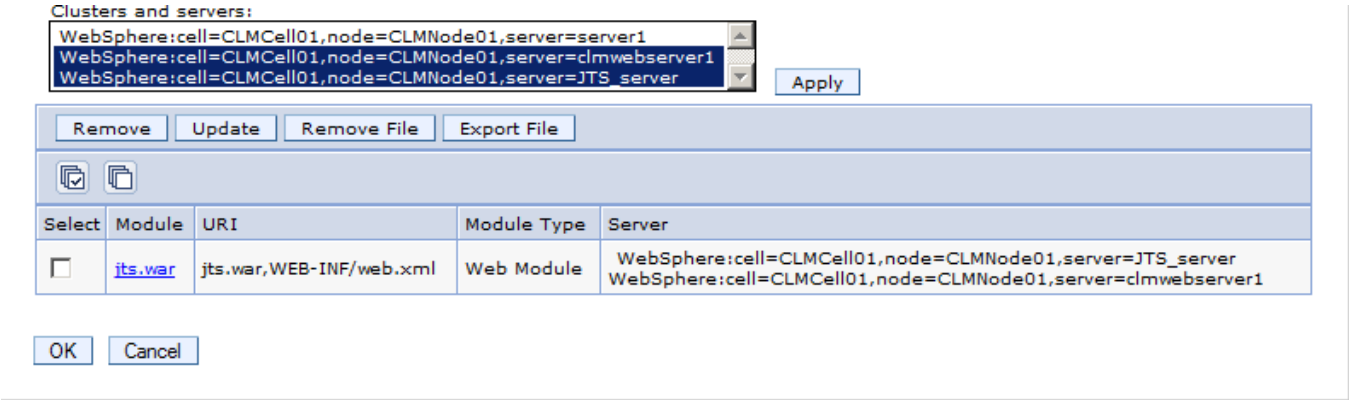
__a. Select **Applications > Application Types > Websphere enterprise applications**

__b. Select **jts_war**

__c. Select **Manage Modules**

__d. Highlight **JTS_server** and **clmwebserver1** (both), within Clusters and Servers box

__e. Check the box underneath Select and click **Apply**



__f. Click **OK** and **Save directly to the master configuration**

__6. Update the Web Server Plug-in:

__a. Navigate to **Servers > Server Types > Web Servers**

__b. Select the checkbox next to **clmwebserver1** and click **Generate Plug-in**

__c. Select the checkbox next to **clmwebserver1** and click **Propagate Plug-in**

Some WebSphere deployment information

Because the new server where *jts_war* is deployed, is part of the same WebSphere Application Server Cell, just modifying the module mapping and synchronizing the modules mapping will redeploy the application in the new server.

In WebSphere Application Server, a Cell is a virtual unit that is built with a Deployment Manager and one or more nodes. A cell provides a way to group one or more nodes of the product. The Node is another virtual unit that is built with a Node Agent and one or more Server instances.

For more information about these concepts, you can check the WebSphere Application Server Infocenter.

In your real environment, depending on your topology, you might need to perform uninstall and re-install tasks as part of your changes.

__7. Start the IHS:

__a. Open an explorer window and navigate to **C:\AdminWS\IBM\HTTPServer\bin**

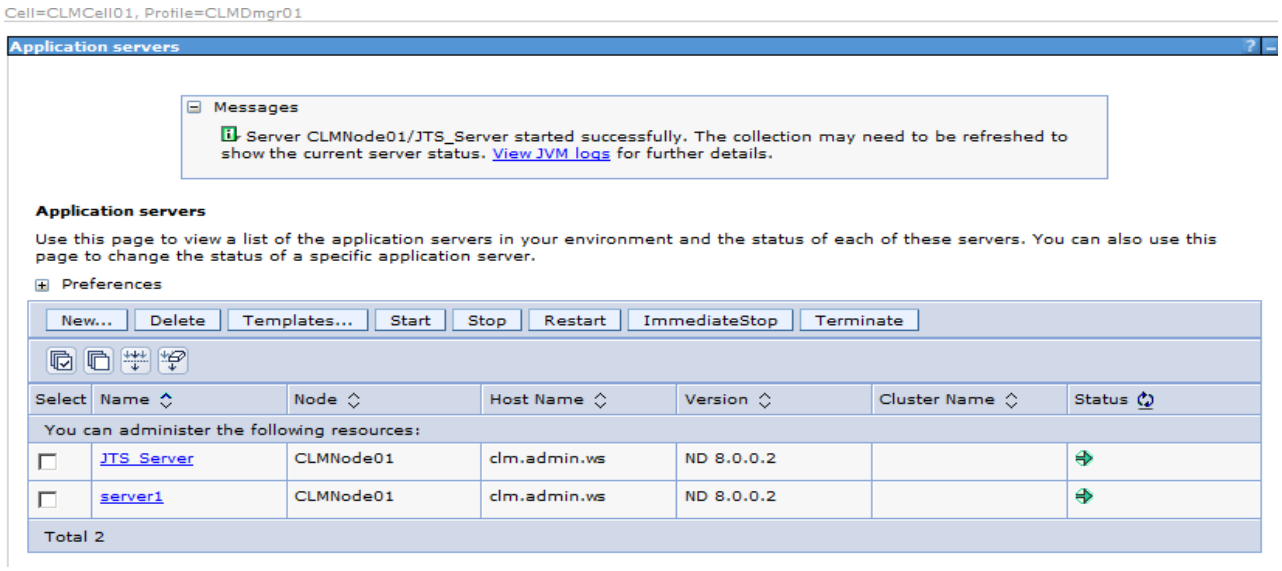
__b. Double-click ***httpd.exe***

__8. Start the servers:

__a. Navigate to **Servers > Server Types > WebSphere applications servers**

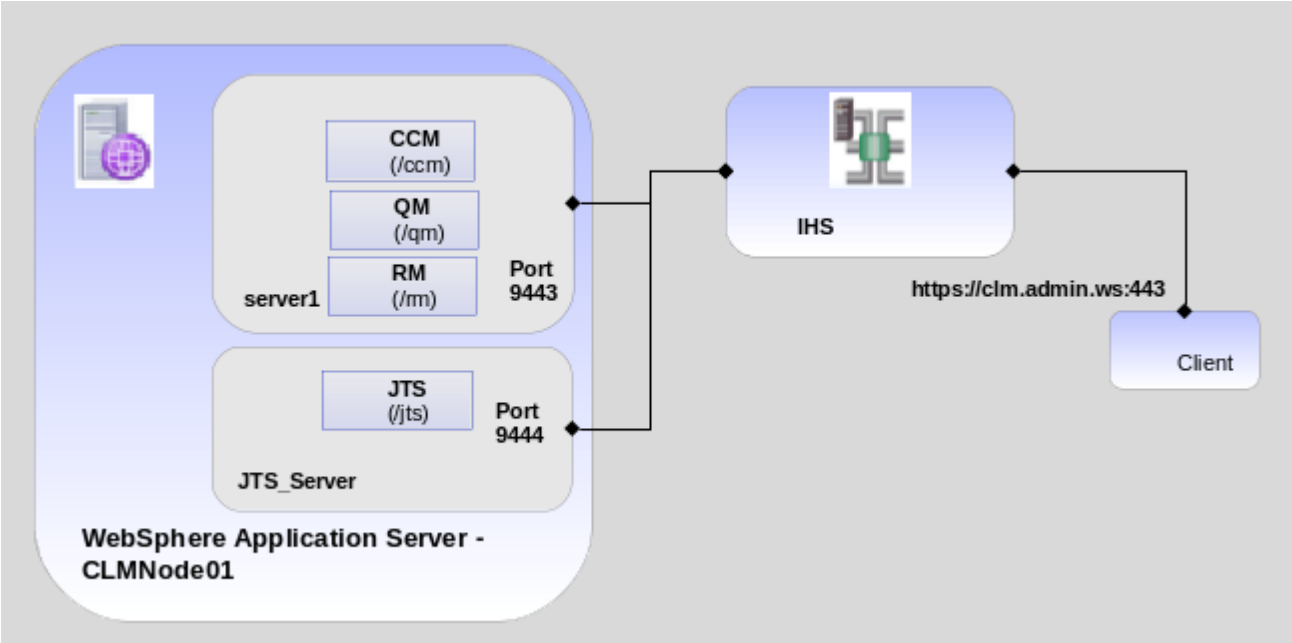
__b. Select the check box next to **server1** and **JTS_server** *(*make sure that both are checked*).*

__c. Click **Start**



__9. Now you can repeat the health check

The steps we have performed in this part of the lab have demonstrated how a reverse proxy can isolate our CLM installation from changes in the deployment topology. We have moved the Jazz Team Server application to a different server, listening on a different port; however, these changes have not had impact because of the IHS redirection.



In your real environment these changes can be more important (for example, moving applications to a different machine), and mechanisms like the one shown will allow you to maintain the public URI for CLM.

3.4 Summary

In this lab you have performed the set up of a reverse proxy using the IBM HTTP Server within the Departmental Topology. You have also explored some basic server configuration changes to the application server deployment, testing the stable behavior of CLM by means of the proxy.

In the last part of the lab, you worked on a simple example of a distributed CLM applications deployment, and witnessed how the reverse proxy masks these architectural changes.

The configuration shown has demonstrated a way of allowing your CLM deployment to scale or change its topology configuration, while still maintaining the public URI.

Lab 4 High Availability (Clustering)

In this lab, you will build on what was done in Lab 3 and migrate the topology to a clustered middle-ware topology that provides high availability.

You will mimic the behavior of two separate machines, even though only one virtual machine is being used for this workshop. The easiest way to create this simulation is to add another NIC to the VM that you are currently running and give it a new host name.

In order to provide this capability CLM 4.0 uses WebSphere eXtreme Scale (WXS) which will first need to be installed and existing WebSphere profiles augmented. This is our first task.

WebSphere eXtreme Scale is an elastic, scalable, in-memory data grid. The data grid dynamically caches, partitions, replicates, and manages application data and business logic across multiple servers.

After the installation of WebSphere, it will then be necessary to move the existing application server into a cluster configuration in WebSphere and modify teamserver.properties.

Once a single node cluster is in working order then another node will be created by using the existing application server as a template.

At the end of the lab you will have set up a two node cluster which will provide high availability at the middle-ware layer. Further redundancy can be provided by the RDBMS being used to provide even more fault tolerance (by using DB2 HADR, for example). These topics are outside the scope of this workshop.

In Summary, the topics are:

- Set up virtual machine to use another NIC, IP and hostname
- Install WebSphere eXtreme Scale
- Set up a one node cluster
- Set up a two node cluster

CLM 2012 clustering feature key

In this lab you are going to configure a CLM 2012 cluster solution. To be able to enable this capability you need a feature key from IBM Software Support. For more information regarding this process check Clustering for high availability

Lab 4 execution in the workshop!

In case you have performed the optional part of Lab 3, called “3.3 Sample case: moving JTS to a different server (Optional)”, please refer to the last section, 4.9, at the end of the lab.

4.1 Set up the virtual machine

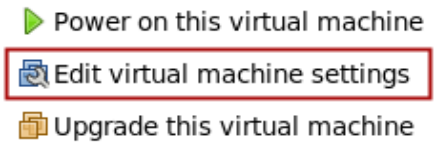
The easier way to add another IP address to the virtual machine and have it assigned an IP address,etc. Is to simply add another network device to the virtual machine itself. The instructions for this varies for the particular operating system and version of VMWare being used by the host. The instructions that follow are for a Linux host using VMWare Workstation 8.0. Instructions for other combinations will be roughly the same.

After this is done you will find that the desktop information has been updated with two ip addresses. You will need to assign host names to both. Our original, clm.admin.ws and a new one clmnode2.admin.ws.

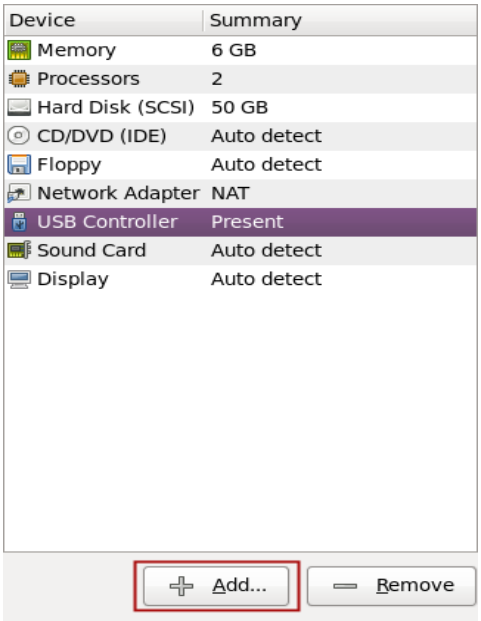
4.1.1 Adding a new NIC

__16. Shut down (not suspend) the virtual machine by shutting down the OS cleanly.

Once shut down click on **Edit virtual machine settings** in the virtual machine window

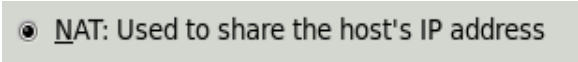


__17. Click the **Add...** button

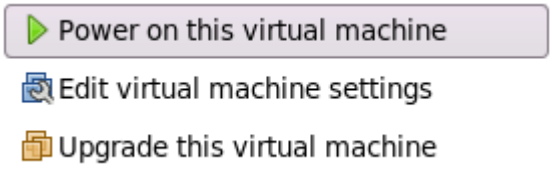


__18. Select “Network Adapter”

__19. Select “NAT: Used to share the host's IP address”



__20. Click the **Finish** button and then the **Save** button on the lower right corner

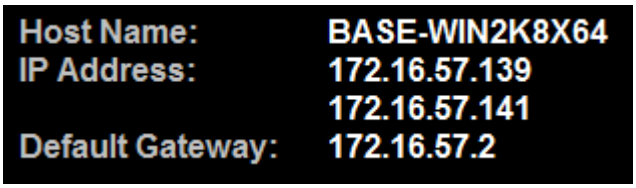


__21. Click **Power on this virtual machine**

4.1.2 Adding host names

Once the virtual machine has rebooted, it is then necessary to modify the hosts file and add names to the two NIC's and there corresponding IP addresses as assigned by DHCP.

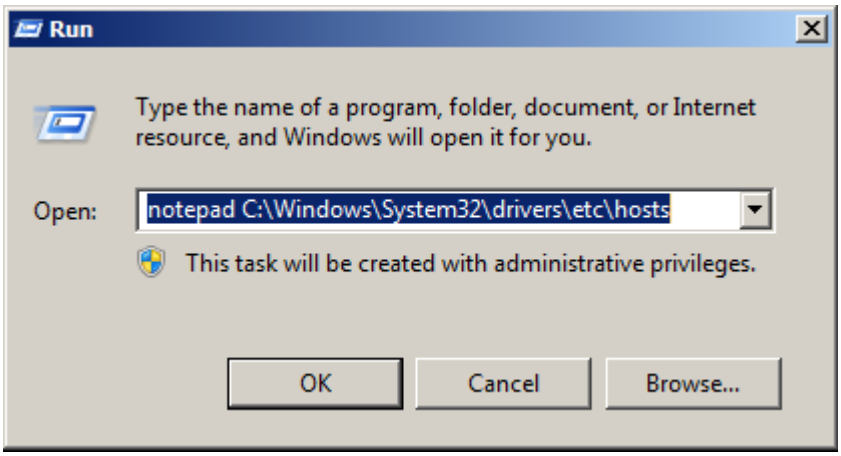
You will see the two IP addresses on the desktop information:



You will now need to add these ip addresses to your host file.

__1. Open the start menu and click **Run....** Put the following command into the “Open:” field:

```
notepad C:\Windows\System32\drivers\etc\hosts
```



__2. Take note of the IPs on the desktop and assign the one with the smallest last segment to clm.admin.ws and the other to clmnode2.admin.ws. For example:

```
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
```

```
# For example:
#
#      102.54.94.97     rhino.acme.com          # source server
#       38.25.63.10     x.acme.com              # x client host

# localhost name resolution is handled within DNS itself.
#      127.0.0.1       localhost
#      ::1             localhost

172.16.57.139   clm.admin.ws
172.16.57.141   clmnode2.admin.ws
```

Important!
If you reboot the virtual machine, you may need to repeat these stems as the DHCP lease may expire and new IP addresses are thereby assigned.

__3. Save and close the hosts file.

4.2 WebSphere eXtreme Scale installation

CLM uses WebSphere eXtreme Scale (WXS) to provide clustering capabilities. This implies that the existing WebSphere profiles that host both the deployment manager and the node agents need to be updated. The deployment manager will be updated to be able to act as the primary WXS catalog server while the nodes agents can also provide secondary catalog server replicas in addition to the components needed by the applications that are using WXS in the node itself (i.e. CLM).

The catalog service controls, discovers and monitors the health of container servers in the data grid. It is built to service hundreds of container servers that become available simultaneously, and run services to manage the container servers.

Installation of WebSphere eXtreme scale 7.1.1.1 involves the installation of the base product in addition to some fix packs and interim fixes. These can all be found in the **C:\AdminWS\Downloads** folder.

First you must ensure that all WebSphere processes are stopped. As you rebooted in **section 4.1**, this will be the case. If you did not reboot, you should stop all application servers as well as the node agents and the deployment manager. This can be done by opening a command prompt and running the following commands. When asked for user name and password put wasadmin/wasadmin.

```
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin\stopServer.bat server1
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin\stopNode.bat
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMDmgr01\bin\stopManager.bat
```

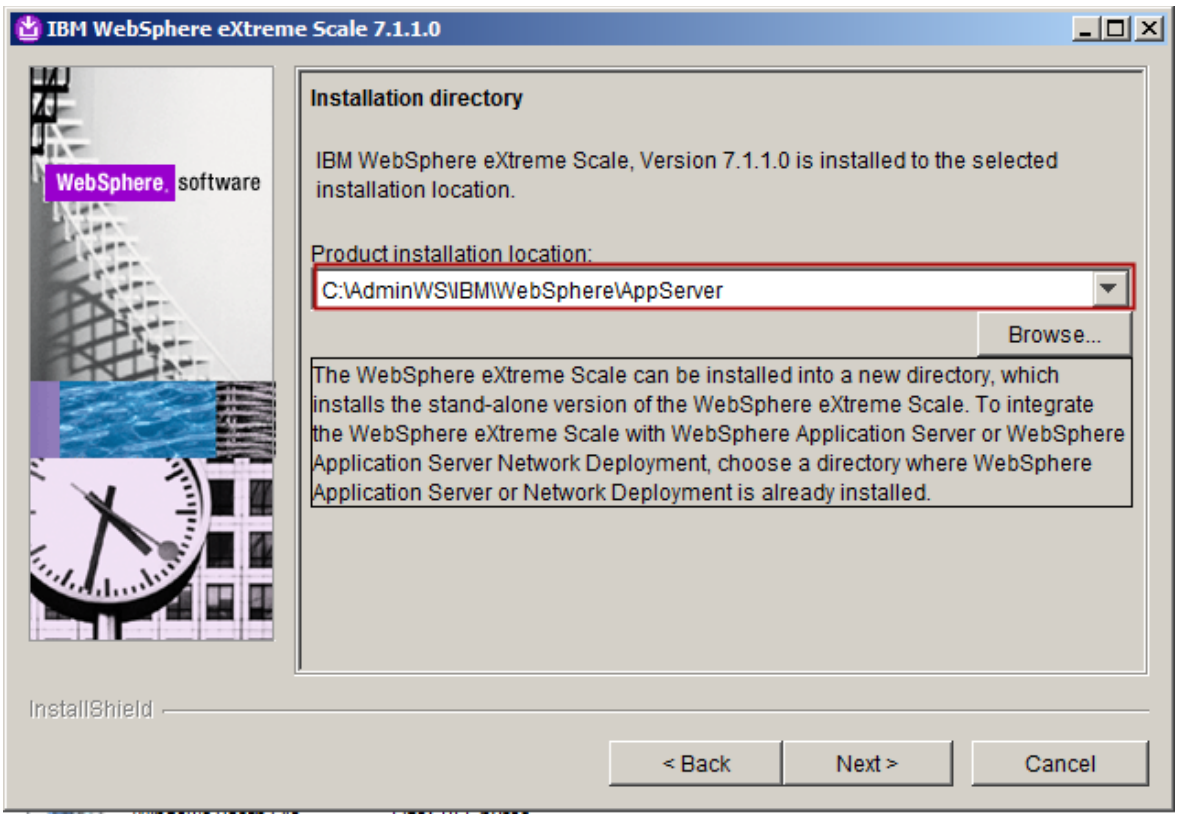
4.2.1 Installation of WebSphere eXtreme Scale 7.1.1.0

__1. Extract the binaries for WebSphere eXtreme Scale product. You will have a file either called CI294ML.zip or WS_XSCALE_V7.1.1_MP_ML.zip

__2. Run **install.bat** in the extracted directory

__3. Select **Next** twice. Accept the license agreement when prompted.

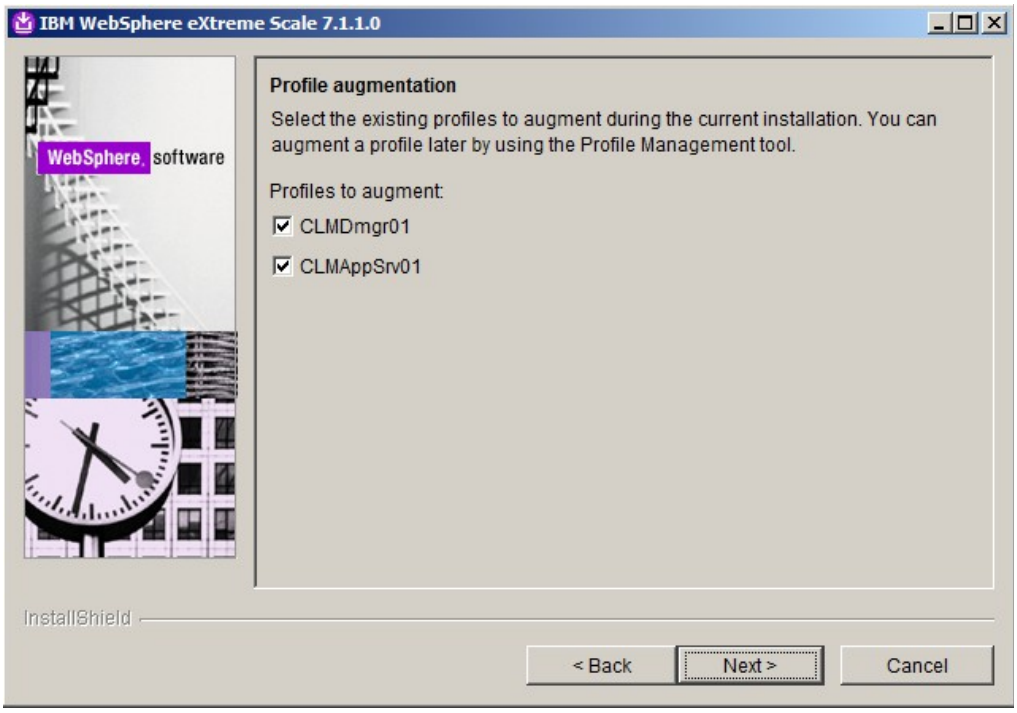
__4. In the “Production Installation location” put **C:\AdminWS\IBM\WebSphere\AppServer** as Websphere eXtreme Scale needs to be integrated into the Websphere Application Server – Network Deployment Server:



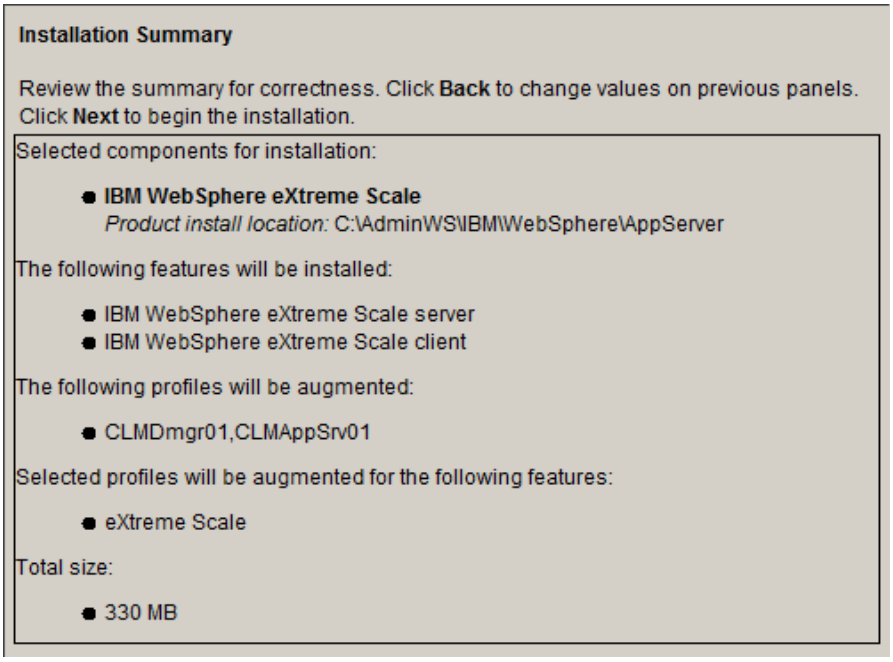
__5. Click **Next**. Confirm the installation choice. Click **Next**. Confirm the selected directory.

__6. Leave the default "Optional Features". Click **Next**.

__7. Ensure both the deployment manager profile and the node profile are selected



__8. Click “Next” and the installation summary should look like:



__9. Click **Next**. The installation should claim **“Success”**

4.2.2 Installation of Websphere eXtreme Scale 7.1.1.1

In order to upgrade Websphere eXtreme scale to 7.1.1.1, we need to install both a fix pack and an interim fix. The WebSphere Update Installer is required to do this.

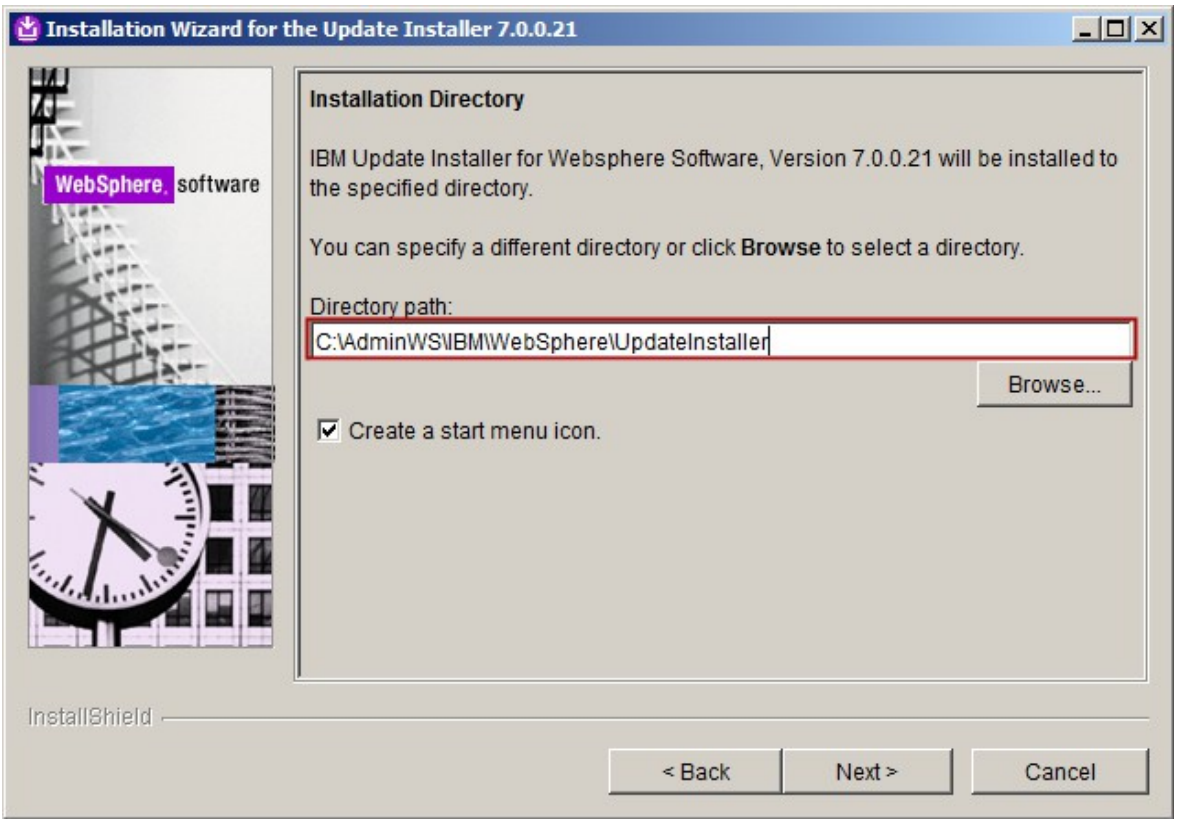
__1. Extract the file for WebSphere Update Installer: **7.0.0.23-WS-UPDI-WinAMD64.zip**

> **WebSphere Update Installer**
> You can find the latest release of WebSphere Update Installer version 7 in this location.

__2. Run **install.exe** located within "UpdateInstaller" of the extracted folder

__3. Click **Next**, accept the license and select **Next** two more times until you reach the screen when you are asked for the installation directory path.

__4. Install the product into "C:\AdminWS\IBM\WebSphere\UpdateInstaller"



__5. Click **Next** two times **but do not click "Finish" yet!**

__6. Move the C:\AdminWS\Downloads*.pak files into *C:\AdminWS\IBM\WebSphere\UpdateInstaller\maintenance* folder

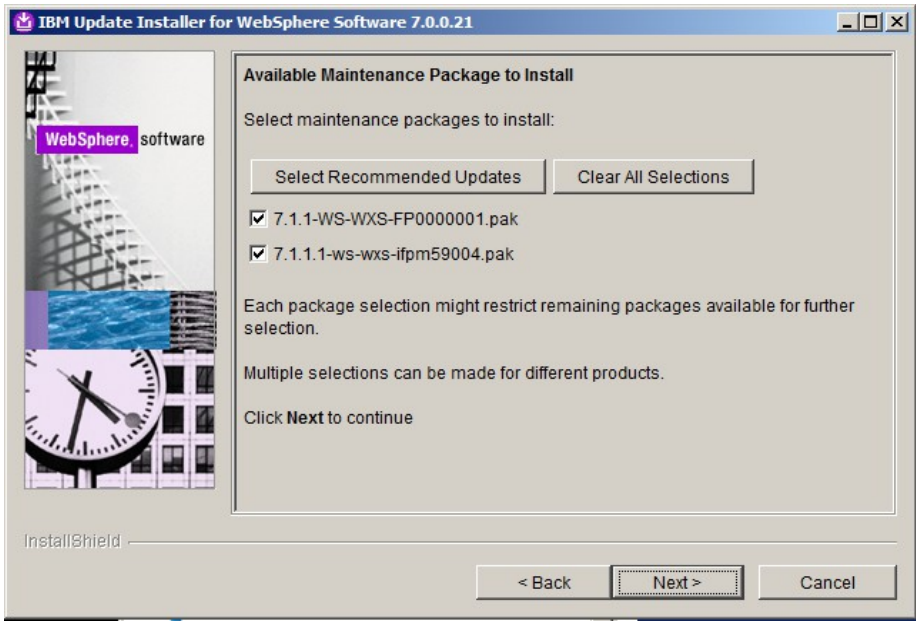
__7. Leave the option to launch the Update Installer selected and now click **Finish**

__8. Select **Next**. Keep default product selection, which should be: "C:\AdminWS\IBM\WebSphere\AppServer". If not correct the field with this value.

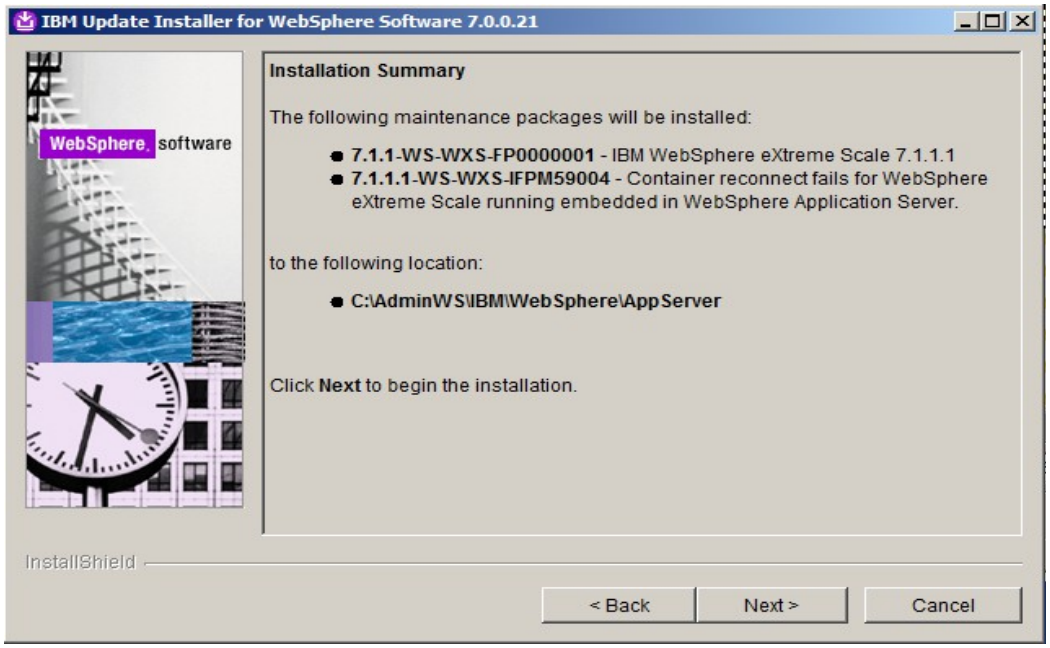
__9. Click **Next**. Keep default "Install maintenance package"

__10. Click **Next**. Keep default maintenance package directory "C:\AdminWS\IBM\WebSphere\UpdateInstaller\maintenance"

__11. Click **Next**. Keep Package selections. (At the time of writing was 7.1.1-WS-WXS-FP0000001.pak and 7.1.1.1-ws-wxs-ifpm59004.pak)



__12. Click **Next**. Installation Summary should look like:



__13. Click **Next** then click **Finish**

4.2.3 Installation Verification

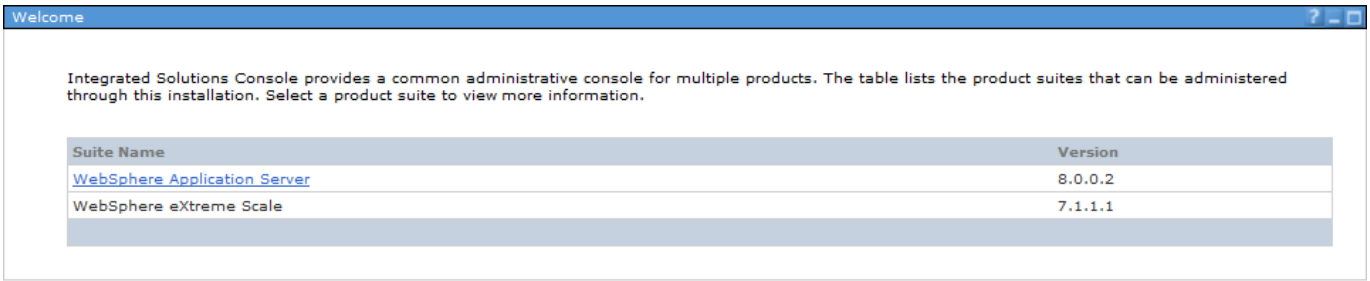
The profiles should now be augmented and WebSphere can be restarted for verification.

__1. Restart the deployment manager and the node agent by running the following command from the command prompt:

```
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMDmgr01\bin\startManager.bat
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin\startNode.bat
```

__2. Navigate with a browser to the deployment manager at *https://clm.admin.ws:9043/ibm/console* and log in as wasadmin/wasadmin

__3. On the welcome page you should see “WebSphere eXtreme Scale 7.1.1.1” along side “WebSphere Application Server 8.0.0.3”:



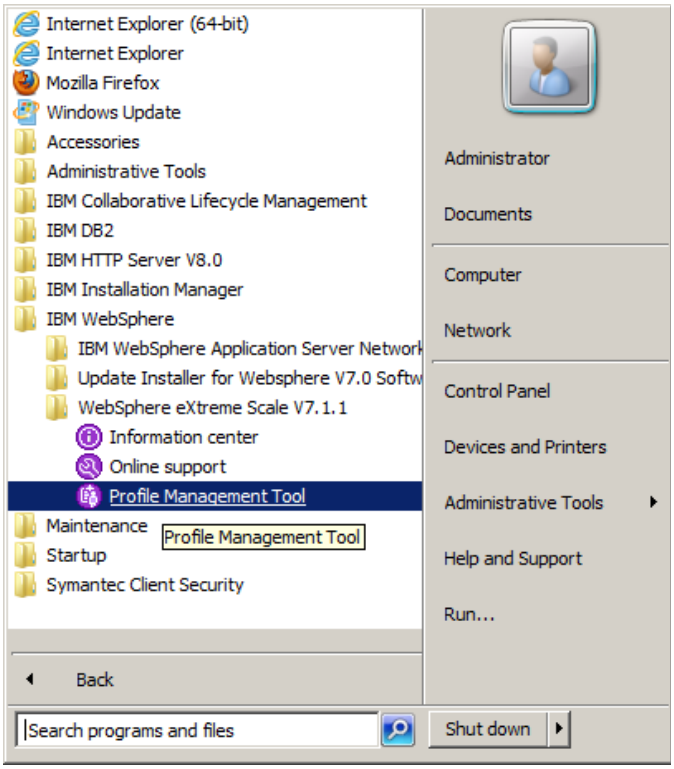
4.3 “CLMNode02” Node definition

In preparation for the cluster it will be necessary to create a new node because as it currently stands we can only create a one node cluster as we have a pre-existing node that was created in previous labs. “server1” is currently installed on this node called “CLMNode01”. The new node we will create in this section will be called “CLMNode02”. In reality there should be three on three separate machines. For this lab, due to hardware and space restrictions we will have two nodes on one machine:

4.3.1 Creation and Federation

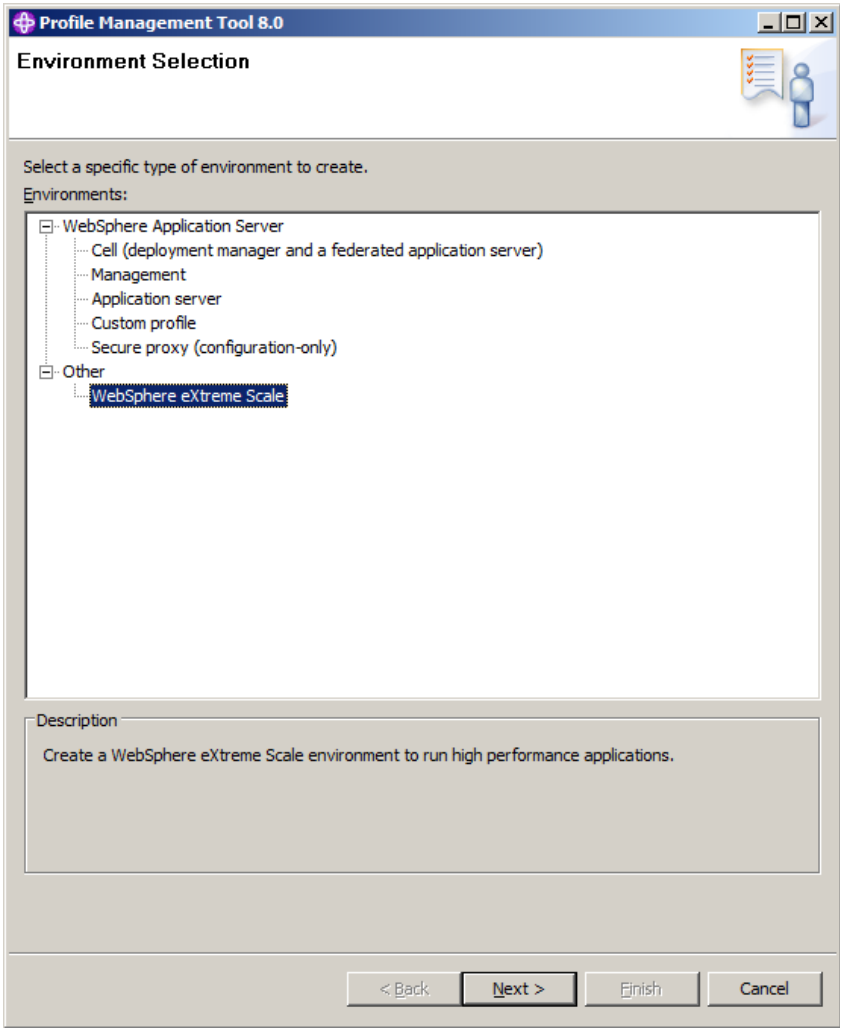
We can use the profile management tool to both create and federate the node.

__1. Find and Launch the “Profile Management Tool” in the start menu at **Start->All Programs > IBM WebSphere > WebSphere eXtreme Scale V7.1.1 > Profile Management Tool**



__2. Click the **Create...** button

__3. Select **Other > WebSphere eXtreme Scale**:



__4. Select **Next**. Select “Custom profile”

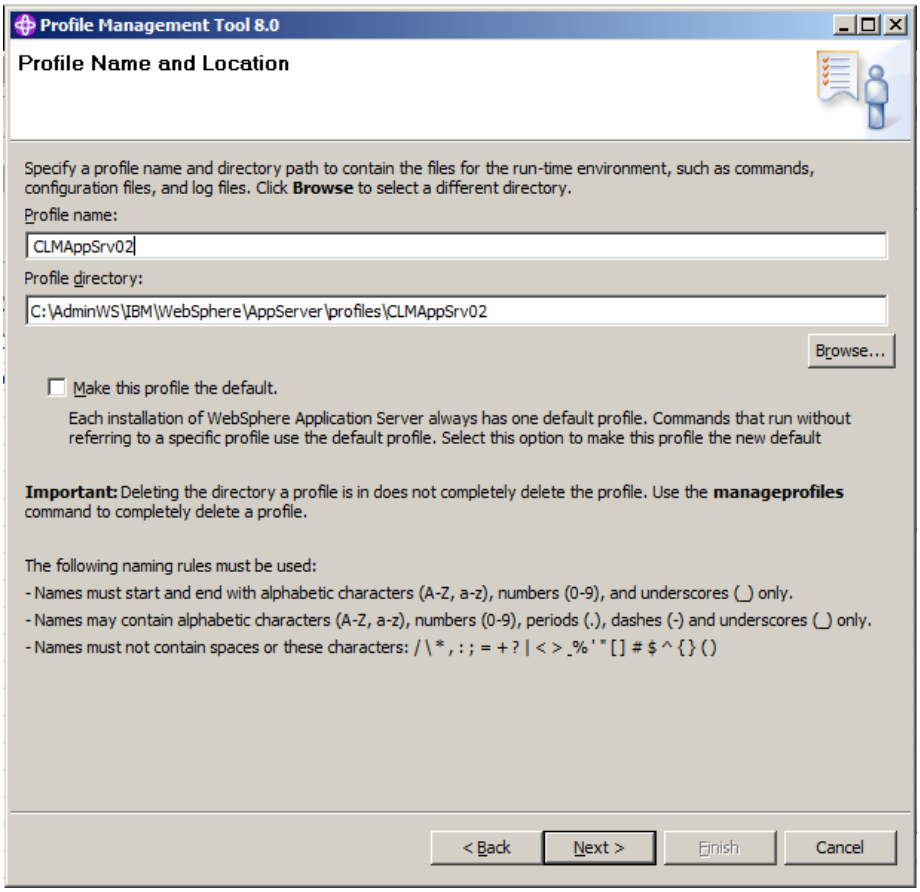
__5. Click **Next**. Select “Advanced profile creation”.

__6. Click **Next** and enter the following values in the next page:

__a. Profile name: CLMAppSrv02

__b. Profile Directory: C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv02

Do not make the profile default.

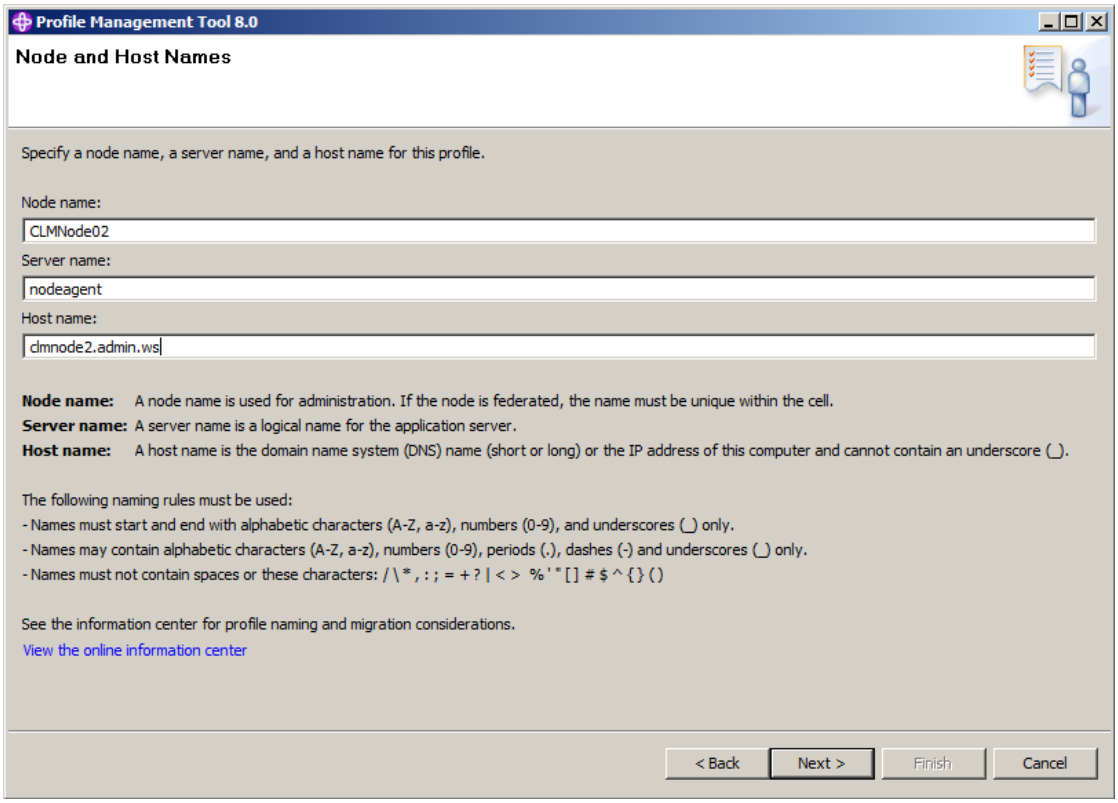


__7. Click **Next**. On the next page:

__a. Node Name: CLMNode02

__b. Server Name: nodeagent

__c. Host Name: clmnode2.admin.ws (our new NIC).



__8. Click **Next**

Important!
Ensure that deployment manager is started before proceeding to the next step. If unsure run the following command from the command prompt:

```
C:\AdminWS\IBM\WebSphere\AppServer\profile
s\CLMDmgr01\bin\startManager.bat
```

__a. Deployment Manager host name or IP Address: clm.admin.ws

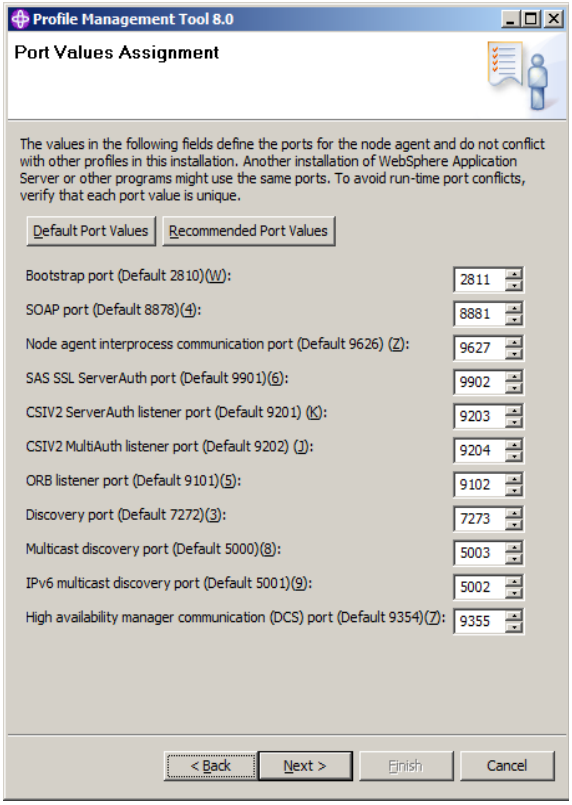
__b. Deployment Manager SOAP port number: 8879

__c. User name: wasadmin

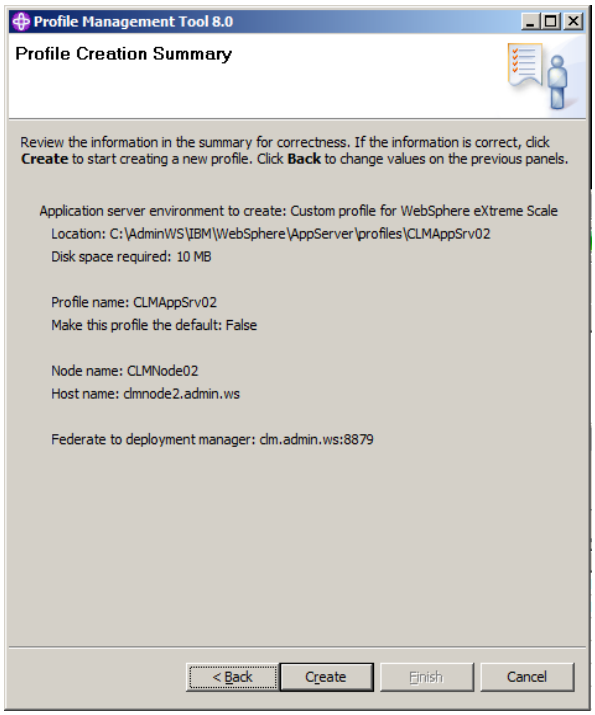
__d. Password: wasadmin

Leave “Federate this node later.” **unchecked**.

__9. Click **Next**. Leave the recommended port values:



__10. Click **Next**. Summary should be as follows



__11. Click **Create**

__12. When finished, close the profile management tool.

4.3.2 Starting CLMNode02

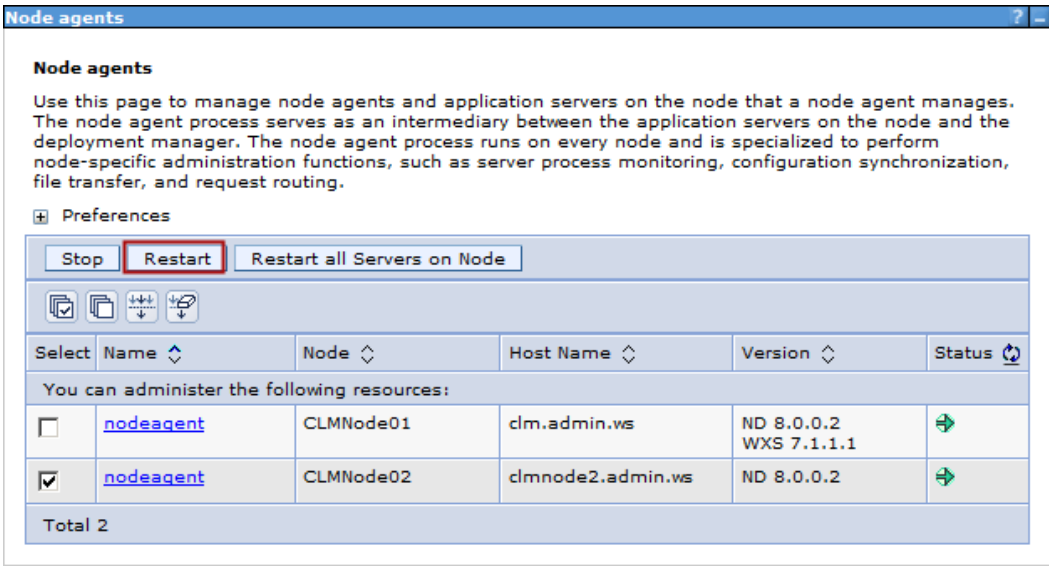
Now that the node profile has been created and federated it can now be started and verified.

__1. Open a command prompt and execute the following command to start the new node. It may already be started in which case it returns an error. This is OK.

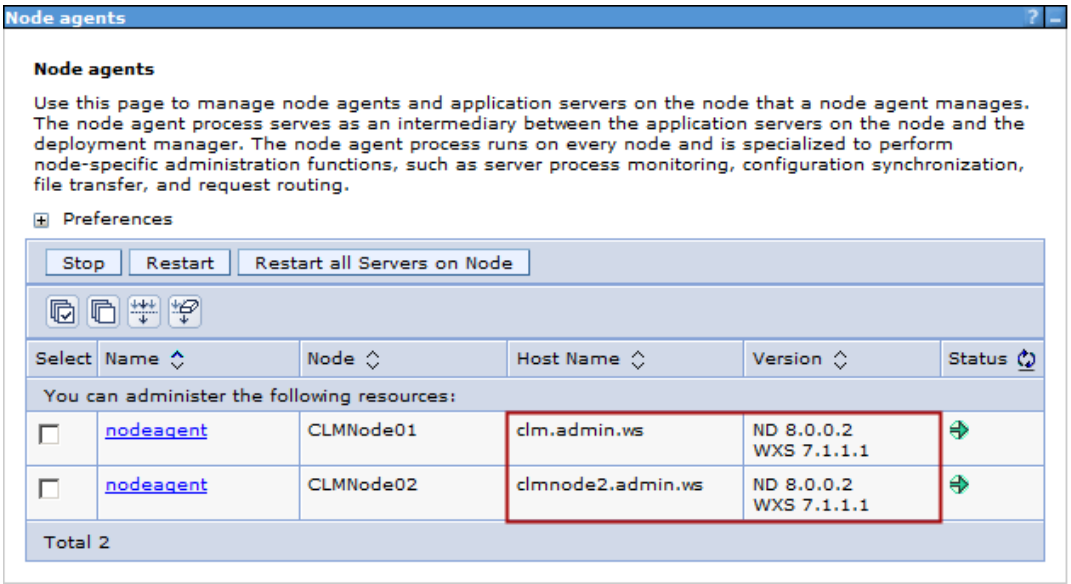
```
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv02\bin\startNode.bat
```

__2. Once started go to the deployment manager administrative console (in a browser navigate to https://clm.admin.ws:9043/ibm/console)

__3. Navigate to the **System Administration > Node agents** section and take note of the node agents. If you notice that the CLMNode2 node agent does not have “WXS 7.1.1.1” in the “Version” column then select the node agent and click the restart button.



__4. Once restarted do a browser refresh and navigate back to **System Administration > Node agents**. You should now see the “WXS 7.1.1.1” in the new node “Version” column



__5. Now we have two nodes which have the WXS components and can host CLM cluster members.

4.4 WXS Catalog Server

The catalog server that was integrated into the WebSphere environment by WXS, needs some specific Object Request Broker (ORB) settings in order to work effectively. By default, the catalog server on the deployment manager is only used. An ORB is a middleware software component that allows one node of the cluster to communicate with another.

In order to make the catalog server highly available, as only running one catalog server on the deployment is a single point of failure, an extra step needs to be performed: the creation of a catalog service domain (CSD). As this is a workshop, it is not absolutely needed and if time is a constraint, you can skip 4.4.2.

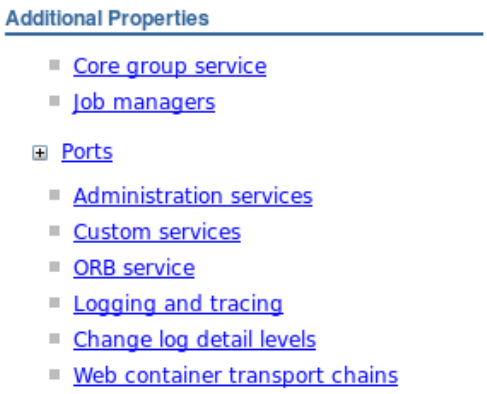
4.4.1 ORB Properties (Deployment manager and node agents)

These instructions need to be performed three times, once for the deployment manager and once for each node agent.

__1. Additional properties must be supplied for ORB timings. Go to deployment manager at https://clm.admin.ws:9043/ibm/console and log in as wasadmin/wasadmin.

__2. The next section needs to be repeated for a) **System Administrator > Deployment Manager** and for each node agent in **System Administrator > Node agents**

__a. Click on **Additional Properties > ORB service**



__b. In the page that loads ensure the following fields are set accordingly:

__i. Request Timeout: 30

__ii. Connection cache maximum: 1024

__iii. Connection cache minimum: 1024

__iv. Locate request timeout: 30

__v. Pass by reference: **checked**

__c. Click **OK** and then **Save directly to the master configuration**. Then on the same page click **Additional Properties > Custom Properties**. (Note that if after clicking OK you may have to navigate to “Additional Properties > ORB service” again to find this option).

__d. Add five new properties: (clik **New...** to add a property and **OK** after entering the values for each)

__i. com.ibm.CORBA.ConnectTimeout: 10

__ii. com.ibm.CORBA.FragmentSize: 0

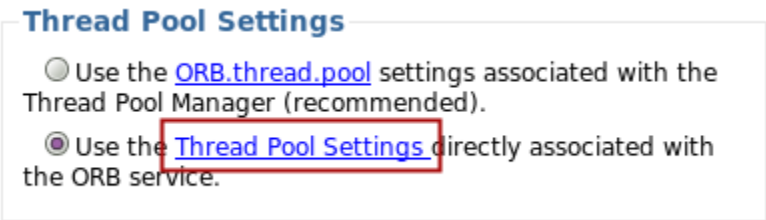
__iii. com.ibm.CORBA.ServerSocketQueueDepth: 1024

__iv. com.ibm.CORBA.NoLocalInterceptors: true

__v. com.ibm.CORBA.ConnectionMultiplicity: 1

__e. Click **Save directly to the master configuration**, then return to the "ORB Settings" page using the bread crumb at the top.

__f. Select **Thread Pool Settings > Thread Pool** Settings at the bottom



__g. In the page that comes up ensure the following fields are set accordingly:

__i. Minimum Size: 256

__ii. Maximum Size: 256

__iii. Allow thread allocation beyond maximum thread size: **unchecked**

__h. Click **OK** and then **Save directly to the master configuration**

__i. Repeat these steps for all nodes and the deployment manager.

> **Information**
> If not performing step 4.4.2 be sure to go directly to 4.4.3 as you will still need to restart WAS ND.

4.4.2 Creating a Catalog Service Domain (CSD) (Optional)

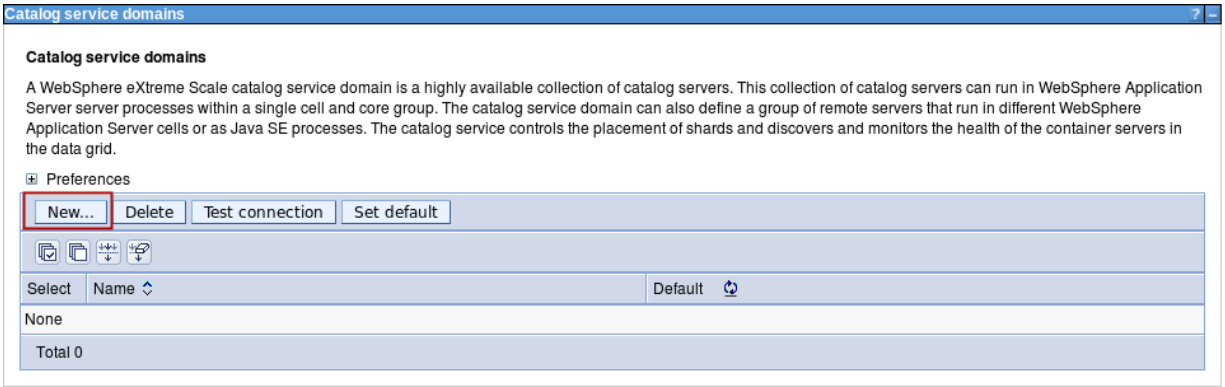
Normally, when you set up the cluster, applications that use WXS connect to the catalog service that is running on the deployment manager and listening on the bootstrap port. This is obviously a single point of failure as when the catalog service, for whatever reason, becomes unavailable then the cluster also becomes unavailable. It is then quite important to set up a highly available Catalog Service Domain for production systems.

As this is not important for the purpose of getting a test cluster running for the workshop, this section is optional.

A catalog service domain (CSD) is a group of catalog servers that are usually deployed on each node agent that are synchronized. Applications connect to the catalog server that is on the node agent that it belongs to. Only nodes that have a WXS profile are able to host a catalog server. To set up a catalog service domain:

__1. Go to the deployment manager administrative console (at https://clm.admin.ws:9043/ibm/console)

__2. Navigate to **System Administration > WebSphere eXtreme Scale > Catalog service domains**. Click **New...**

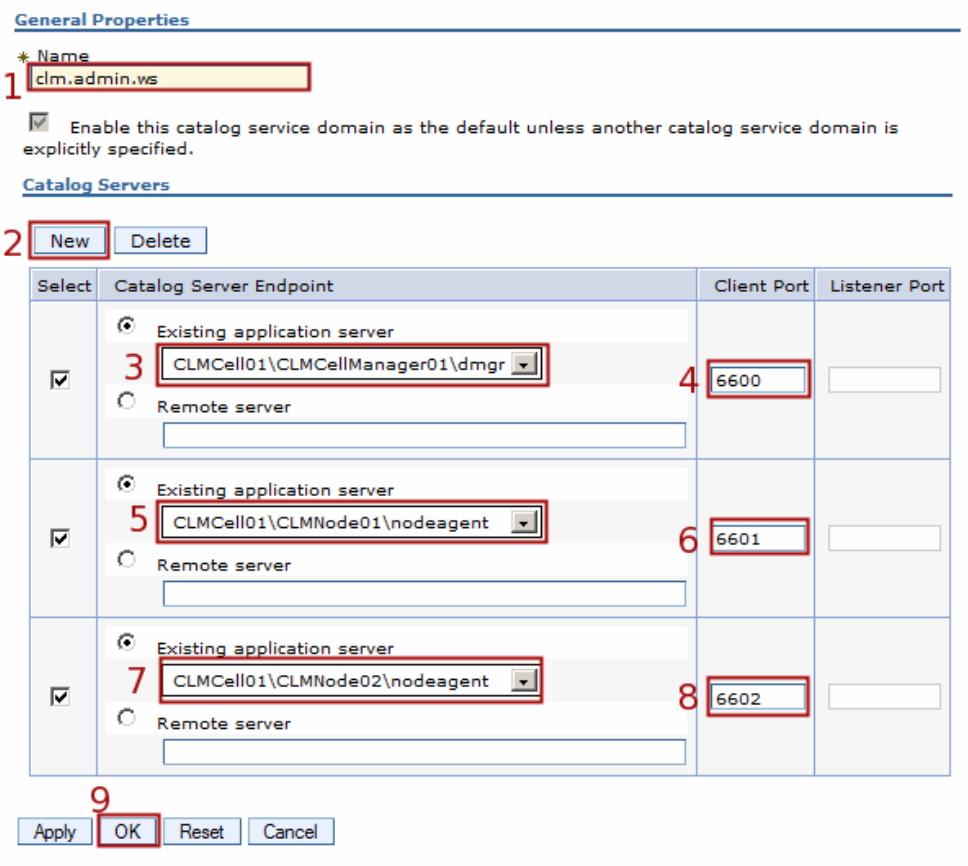


__3. Give the name “clm.admin.ws”. As you will need to create a catalog sever endpoint for the deployment manager and for each node agent, add a row for the server by clicking **New** and add the following values (three rows total). (You can use any port for the "Client Port" but a common convention is to use 6600, 6601, etc.0 for the node agents to avoid a conflict if a node agent is running on the same machine as the dmgr.))

__a. Existing Application Server: CLMCell01\CLMCellManager01\dmgr
Client Port: 6600

__b. Existing Application Server: CLMCell01\CLMNode01\nodeagent
Client Port: 6601

__c. Existing Application Server: CLMCell01\CLMNode02\nodeagent
Client Port: 6602



Then click **OK**

__4. Click **Save directly to the master configuration**

__5. Follow the directions in 4.4.3 to restart the entire catalog service.

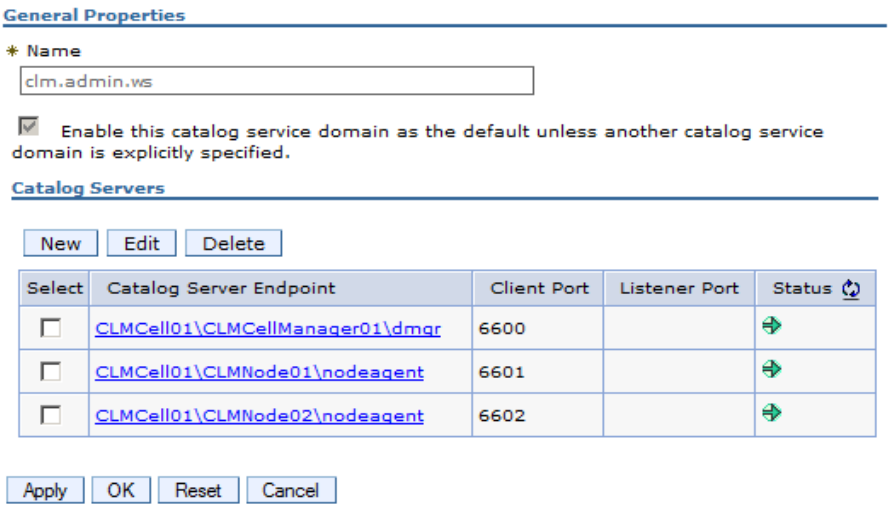
4.4.3 Restarting the catalog service

In order for the ORB settings and catalog service domain configurations to take effect, a restart needs to be performed in the following order (**order is important!**). When asked for a user name and password be sure to supply wasadmin/wasadmin. Also make sure one server has completed starting before starting another server.

Open a command prompt...

```
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv02\bin\stopNode.bat
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin\stopNode.bat
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMDmgr01\bin\stopManager.bat

C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin\startNode.bat
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv02\bin\startNode.bat
C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMDmgr01\bin\startManager.bat
```

If you set up a CSD in 4.4.2 you can check its status at *System Administration* > *WebSphere eXtreme Scale* > *Catalog service domains*. Click on the newly created catalog service domain and ensure the status is green for all the catalog servers. Also click the **Test Connection** button.



4.5 Cluster member template

We now have two nodes into which we could install CLM. We already have an application server that we created in earlier labs called “server1” that is currently hosted by node “CLMNode01”. In this section we set the properties that are required to move the server into a cluster.

The existing server will be modified to act as both the first member of our cluster and a template for future clusters.

To convert an existing server, a few things need to be done to the application server.

- JVM Properties need to be set
- ORB settings need to be modified
- Cookie session tracking needs to be disabled

4.5.1 JVM Properties

Clustering needs some modifications to the JVM parameters that are normally used for a CLM stand alone set up.

__1. Go to the deployment manager (at https://clm.admin.ws:9043/ibm/console)

__2. Navigate to **Servers > Server Types > WebSphere application servers** and click on **server1**

__3. Go to **Server Infrastructure > Java and Process Management > Process definition**

__4. On the right hand side click on **Additional Properties > Java Virtual Machine**

__5. In the page that comes up ensure the following fields are set accordingly:

__a. Initial heap size: 4096

__b. Maximum heap size: 4096

__c. Generic JVM Arguments: -Xgcpolicy:gencon -Xgc:preferredHeapBase=0x100000000 -Xmn512m

__6. Click **OK** and **Save directly to the master configuration**

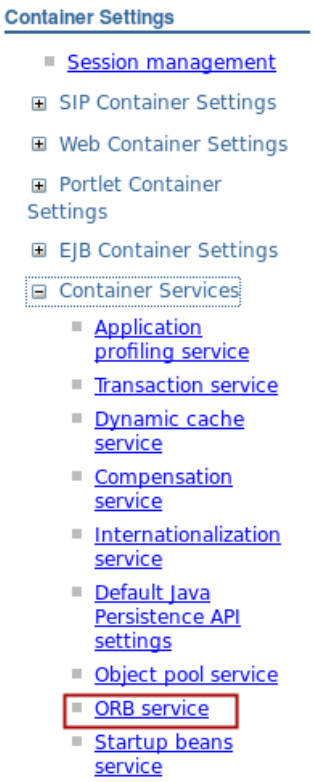
4.5.2 Server ORB Properties

The same type of ORB properties that were supplied for the catalog servers also should be applied to the application servers.

__1. Go to the deployment manager (at https://clm.admin.ws:9043/ibm/console)

__2. Navigate to **Servers > Server Types > WebSphere application servers** and click on **server1**

__3. Go to **Container Settings > Container Services > ORB Service**



__4. In the page that loads ensure the following fields are set accordingly:

__a. Request Timeout: 30

__b. Connection cache maximum: 1024

__c. Connection cache minimum: 1024

__d. Locate request timeout: 30

__e. Pass by reference: **checked**

__5. Click **OK** and **Save directly to the master configuration**. Navigate back to the ORB services settings and click **Additional Properties > Custom Properties**

__6. Add five new properties:

__a. com.ibm.CORBA.ConnectTimeout: 10

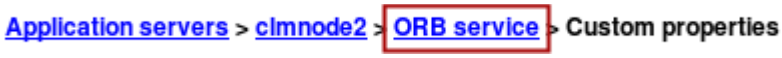
__b. com.ibm.CORBA.FragmentSize: 0

__c. com.ibm.CORBA.ServerSocketQueueDepth: 1024

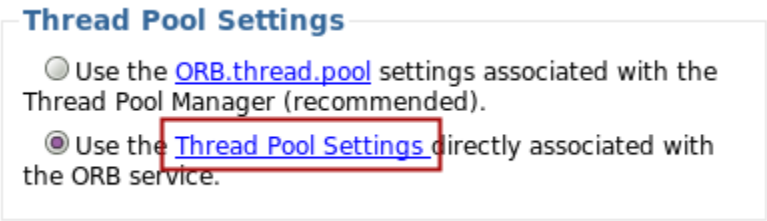
__d. com.ibm.CORBA.NoLocalInterceptors: true

__e. com.ibm.CORBA.ConnectionMultiplicity: 1

__7. Select **Save directly to the master configuration**, then return to the "ORB service" page using the bread crumb at the top:



__8. Click **Thread Pool Settings > Thread Pool Settings** at the bottom



__9. In the page that comes up ensure the following fields are set accordingly:

__a. Minimum Size: 256

__b. Maximum Size: 256

__c. Allow thread allocation beyond maximum thread size: unchecked

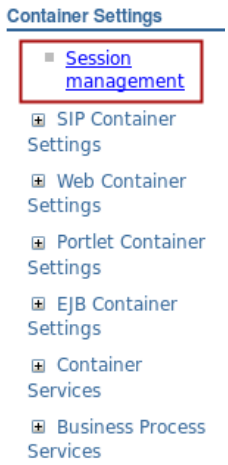
__10. Click **OK** and then **Save directly to the master configuration**

4.5.3 Disable Cookie Tracking

The CLM clustering works more effectively if session affinity is disabled. Disabling cookie tracking at the application server level accomplishes this.

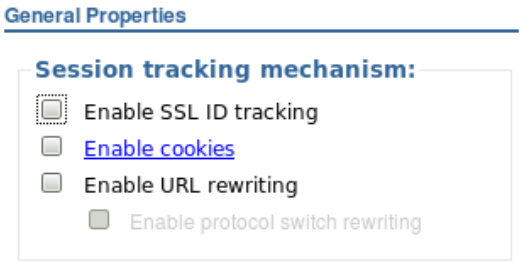
__1. Go to the deployment manager (at https://clm.admin.ws:9043/ibm/console)

__2. Navigate to **Servers > Server Types > WebSphere application servers** and click on **server1**



__3. Click on **Container Settings > Session Management**

__4. Ensure that "Enable cookies" is **deselected**.



__5. Click **OK** and then **Save directly to the master configuration**

4.5.4 Template the Server

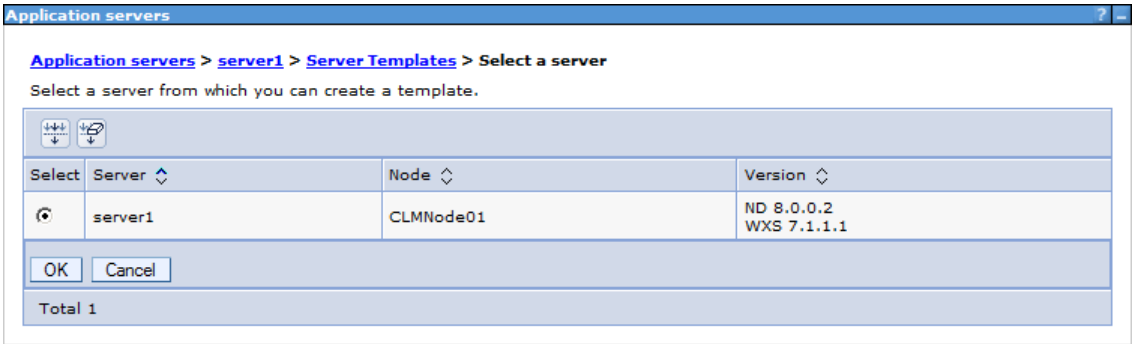
Having to set all the ORB, JVM and CLM specific parameters each time can be quite painful so it is suggested to create a template of the server.

__1. Go to deployment manager at https://clm.admin.ws:9043/ibm/console and log in as wasadmin/wasadmin.

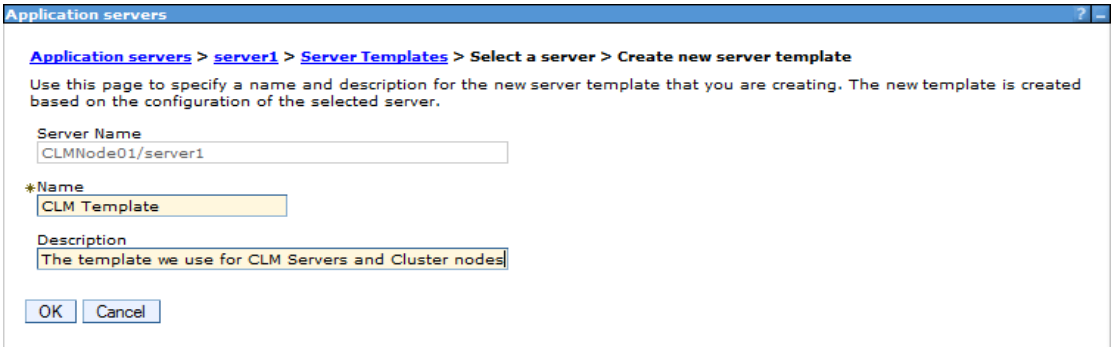
__2. Navigate to **Servers > Server Types > WebSphere application servers** and select the checkbox next to “server1” and click the **Templates...** button

__3. As you want to create a new template, click the **New...** button

__4. Select “server1” as the template and click **OK**.



__5. Give the template a name such as “CLM Template”



__6. Click **OK**, then **Save to the master configuration**

4.6 Cluster

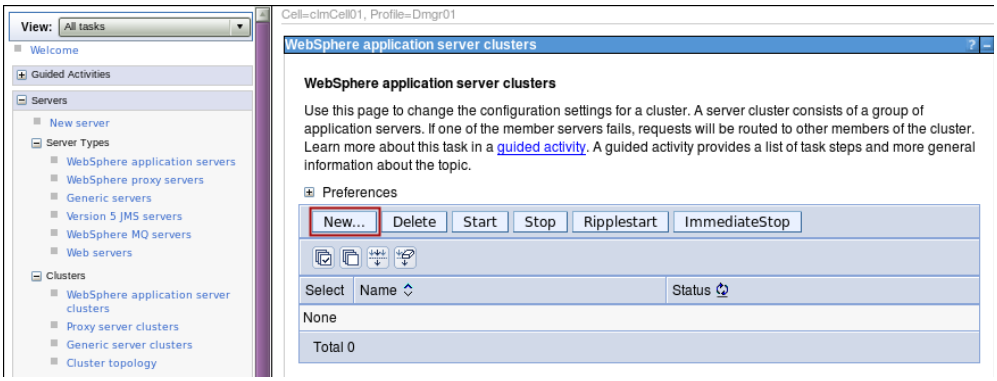
In this section, we will take “server1” and convert it from a stand alone server into a two node cluster.

4.6.1 Creating the cluster from “server1”

We will create the first member from the existing server. “server1”. We could also use the template we created in section 4.5.4 but using the server will automatically transfer all the applications bindings to the cluster saving a tedious step.

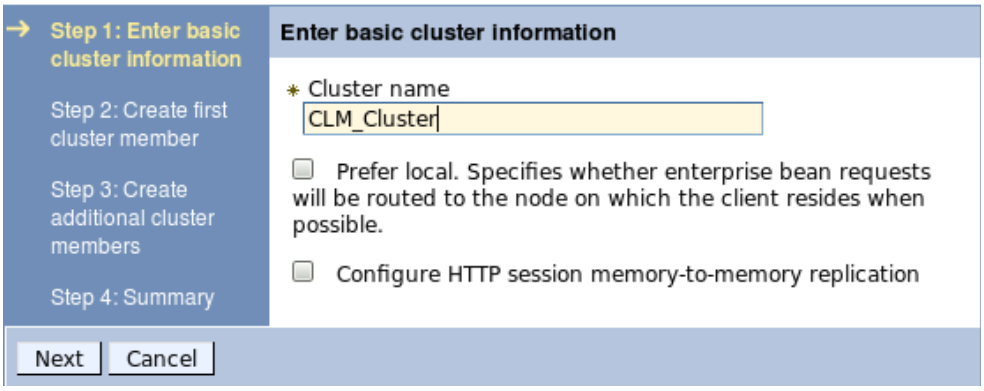
__1. Go to the deployment manager (at https://clm.admin.ws:9043/ibm/console)

__2. Navigate to **Server > Clusters > WebSphere application server** clusters and click the **New...** button.



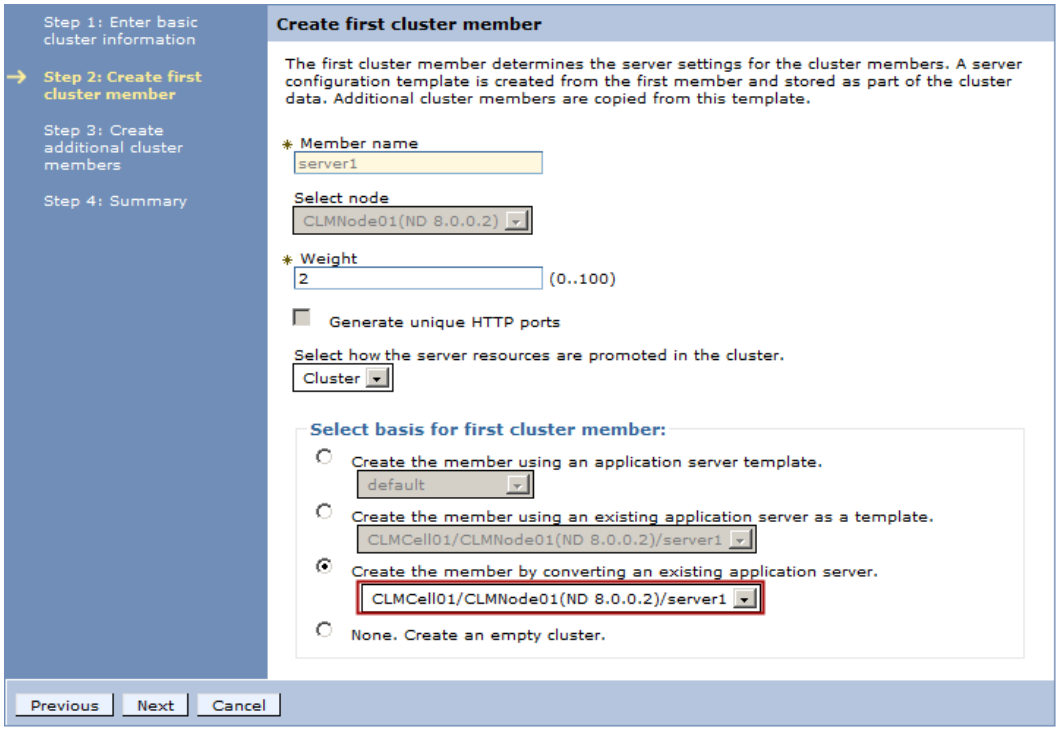
__3. On the next page deselect the "Prefer local. Specifies whether enterprise bean requests will be routed to the node on which the client resides when possible." option, as this is not utilized by CLM applications.

Use the name "CLM_Cluster".



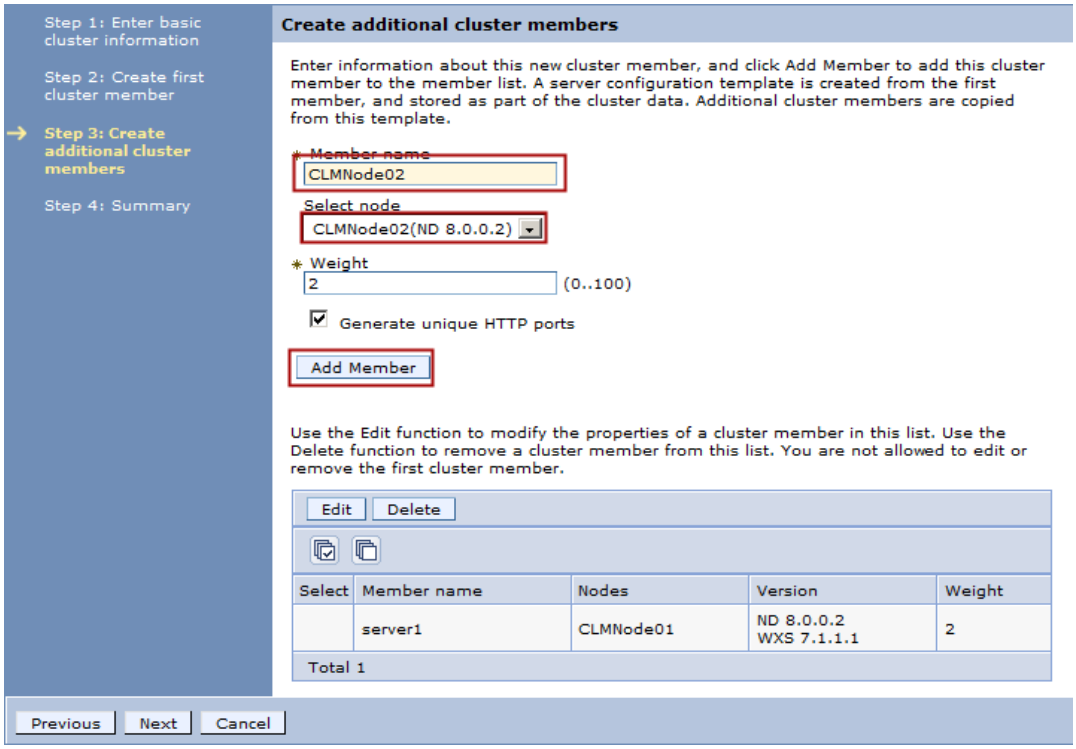
__4. Click **Next**. This is where we can specify to use a template or an existing server. We wish to use an existing server "server1". The rest of the properties will fill in automatically as "server1" will determine them from its current configuration. This is accomplished by selecting CLMNode01 under the "Create the member by converting an existing application server" option.

Use a weight value of "2"

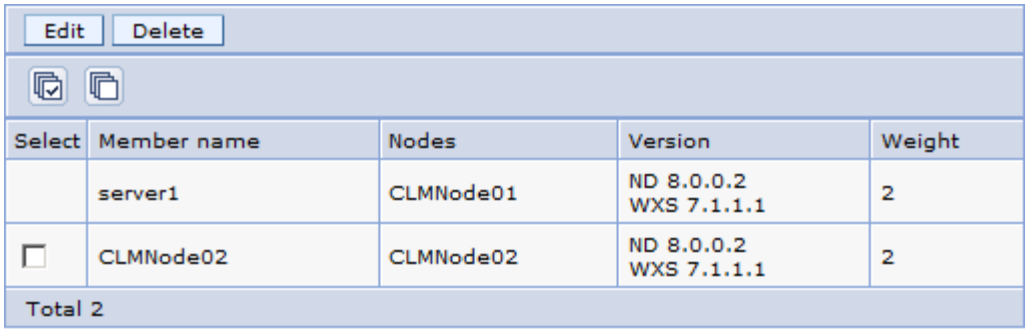


__5. Click **Next**. Now lets add another cluster member on CLMNode02. Give the member the name "CLMNode02" and ensure that "CLMNode02" is selected.

Also give it the weight of "2" and ensure the "Generate unique HTTP ports" is selected.



__6. Click **Add Member** after which the new member should be added



__7. Click **Next** then **Finish**

__8. Select **Save directly to the master configuration**.

4.6.2 File System Modifications

Normally, nodes run on separate machines and usually have separate file systems. In these cases the only thing that is required is to copy the JazzTeamServer installation directory to the same location on the files system of the node machines. In this workshop, due to hardware constraints, we have put two nodes on the same machine and hence they are using the same file system.

Each node needs its own copy of the JazzTeamServer directory and as we cannot copy JazzTeamServer to the same location, we need to create a new copy of JazzTeamServer for CLMNode02. We will copy JazzTeamServer to a JazzTeamServer2 later as we still need to modify some properties. For now we will just prepare CLMNode02.

As you may recall, the template we created based on “server1” uses a JAZZ_HOME that is using JazzTeamServer. Due to our unusual workshop-oriented configuration (having two nodes on the same machine) we will need to modify this variable as well as some others for CLMNode02 so that it uses JazzTeamServer2.

__1. Go to the deployment manager (at https://clm.admin.ws:9043/ibm/console)

__2. Navigate to **Servers > Server Types > Websphere application servers** and click on **CLMNode02**

__3. Click on **Server Infrastructure > Java and Process Management > Process Definition**

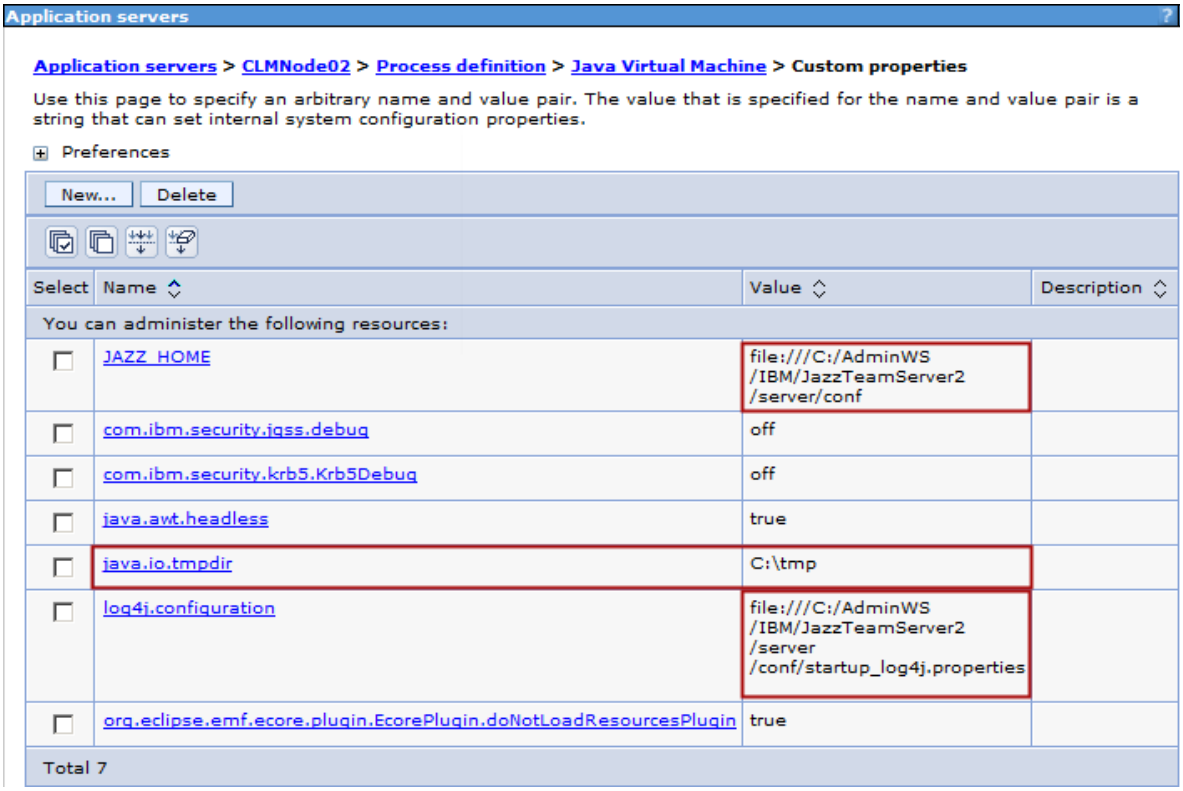
__4. Click on **Additional Properties > Java Virtual Machine**

__5. Then click on **Custom Properties** on the right side. Two properties need to be modified while one needs to be added.

__a. JAZZ_HOME: file:///C:/AdminWS/IBM/**JazzTeamServer2**/server/conf

__b. log4j.configuration: file:///C:/AdminWS/IBM/**JazzTeamServer2**/server/conf/startup_log4j.properties

__c. java.io.tmpdir: C:\tmp



__6. Click **OK** then **Save to master configuration**

4.6.3 Virtual hosts configuration

When applications are installed they are bound to a virtual host, a set of *host → port number* combinations that determines what hosts and ports the application will be listening on. When an application module is targeted to a server, WAS ND only allows the application to listen on a host → port combination that is in the virtual hosts list. We know that we want applications to listen on the secure port, maybe also the unsecured ports for this server so we need to ensure that the host clm.admin.ws and port 9080 and 9443 are in that list. We also need to ensure that clmnode2.admin.ws port 9081 and 9444 are in the list. The reason is that when we selected the “Generate unique HTTP ports” when creating our new cluster member it automatically took the ports of the existing member and incremented them by one.

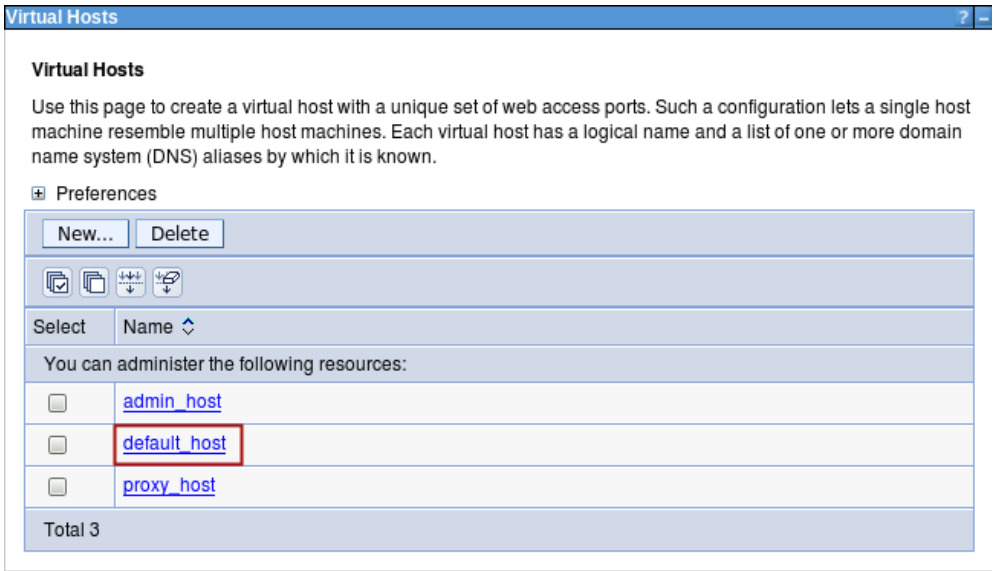
Information

It was not necessary to have unique ports as we have two NICs with two distinct port sets and each cluster member is listening on a separate IP. To make things easier we simply increment the ports as it would have required some more WebSphere configuration beyond the scope of this workshop.

Our web server proxy is listening on port 443 and 80 for clm.admin.ws, server1 is listening on port 9443 and 9080 on host clm.admin.ws and lastly CLMNode02 is listening on port 9444 and 9081 on host clmnode2.admin.ws. So, lets update the virtual hosts configuration to reflect this fact.

__1. Once started go to the deployment manager (at https://clm.admin.ws:9043/ibm/console)

__2. Go to **Environment > Virtual Hosts**. We will use an already set up host called "default_host" as our mapping. Click on default_host



__3. Click on **Additional Properties > Host Aliases**

__4. At this point we need to add our host/port mappings. In the case where we have multiple hosts listening on the same ports (as would be the case if we didn't “Generate unique HTTP ports”) you could use a wildcard “*” for the host name. We will be very specific so that it is clear what hosts are serving what ports. Enter the virtual hosts as they are in the image (deleting if necessary):

New... Delete

Select	Host Name	Port
You can administer the following resources:		
☐	clm.admin.ws	9080
☐	clm.admin.ws	80
☐	clm.admin.ws	9443
☐	clm.admin.ws	443
☐	clmnode2.admin.ws	9444
☐	clmnode2.admin.ws	9081
Total 6		

__5. Click **Save to master configuration**

4.6.4 Update web server with configuration

Normally, the configuration automatically propagates itself to the web server but not in all cases. As we have done a significant amount of change. Let's update and restart the web server.

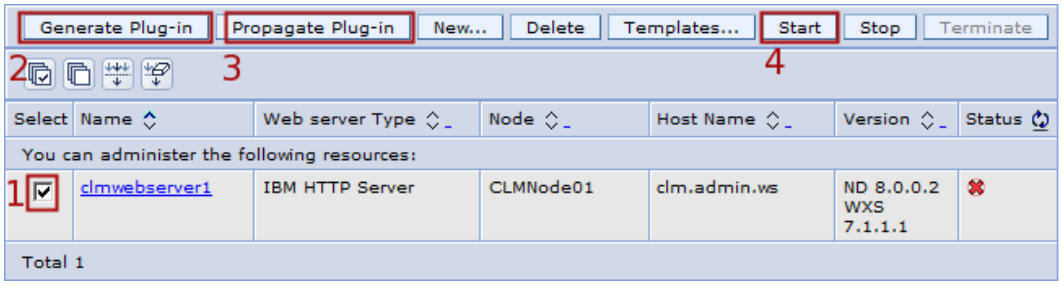
Troubleshooting

To be able to manage the IBM HTTP Server from the deployment manager console, it must be installed as a Windows service. If it is not, usually indicated by an error when trying to start or stop the web server from deployment manager, you may need to add it as a service running the following instruction in a command prompt::

```
C:\AdminWS\IBM\HTTPServer\bin\apache -k
install -n IBMHTTPServerV8.0 -f
C:\AdminWS\IBM\HTTPServer\conf\httpd.conf
```

__1. Go to the deployment manager (at https://clm.admin.ws:9043/ibm/console)

__2. Navigate to **Servers > Server Types > Web servers** and select the web server click **Stop** and then press **Generate Plug-in** then **Propagate Plug-in**, and finally select then **Start**



4.7 Enable CLM Clustering

At this point, the websphere configuration is complete and if you went and only start server you should have a working CLM application. You can try this now.

__1. Go to deployment manager at https://clm.admin.ws:9043/ibm/console and log in as wasadmin/wasadmin.

__2. Navigate to **Servers > Server Types > Websphere application servers**, select “server1” and click **Start**

After some time the server should start and you should be able to navigate to https://clm.admin.ws/jts

Once you have verified that the server can start, shut it down:

__1. Go to deployment manager at https://clm.admin.ws:9043/ibm/console and log in as wasadmin/wasadmin.

__2. Navigate to **Servers > Server Types > Websphere application servers**, select “server1” and click **Stop**

Information
If for some reason the server does not stop in timely fashion you can click “Terminate”

In this section we will do a few things to enable our two node cluster:

- Modify CLM application properties to enable clustering
- Install the feature license key to enable CLM clustering
- Start one node of the cluster, verify it works
- Copy the JazzTeamServer directory to JazzTeamServer2 to accommodate for the unusual workshop configuration.
- Start second node of the cluster, verify everything works.

4.7.1 Modify the CLM application properties

In order to enable CLM application to start using WXS, each unique application for a WXS cluster should have its own grid name. So for example, if there are two JTS applications, each one should have its own grid name. As we are deploying on one application of each type on this cluster we can use the application name followed by "_Grid":

__1. For the JTS application, edit C:\AdminWS\IBM\JazzTeamServer\server\conf\jts\teamserver.properties and add the following line:

```
com.ibm.team.repository.cluster.gridName=JTS_Grid
```

__2. For the CCM application, edit C:\AdminWS\IBM\JazzTeamServer\server\conf\ccm\teamserver.properties and add the following line:

```
com.ibm.team.repository.cluster.gridName=CCM_Grid
```

__3. For the QM application, edit C:\AdminWS\IBM\JazzTeamServer\server\conf\qm\teamserver.properties and add the following line:

```
com.ibm.team.repository.cluster.gridName=QM_Grid
```

__4. For the RM application, edit C:\AdminWS\IBM\JazzTeamServer\server\conf\rm\fronting.properties and add the following lines:

```
com.ibm.team.repository.cluster.gridName=RM_Grid
```

__5. For the LPA application, edit C:\AdminWS\IBM\JazzTeamServer\server\conf\admin\admin.properties and add the following line:

```
com.ibm.team.repository.cluster.gridName=LPA_Grid
```

4.7.2 Install the feature key

To enable the CLM 2012 cluster capability, you have received a feature key from IBM support. This feature key has to be placed in the JAZZ_HOME folder so it is recognized by the CLM applications at start time. Copy the feature key in the folder *C:\AdminWS\IBM\JazzTeamServer\server\conf*

Errors at start up

If you fail to copy the feature key in the specified location, your CLM installation will fail to start.

4.7.3 Start server1

__1. Go to deployment manager at https://clm.admin.ws:9043/ibm/console and log in as wasadmin/wasadmin.

__2. Navigate to **Servers > Server Types > Websphere application servers**, select “server1” and click **Start**

__3. Once the server starts, hit the following URLs:

https://clm.admin.ws:9443/jts/scr

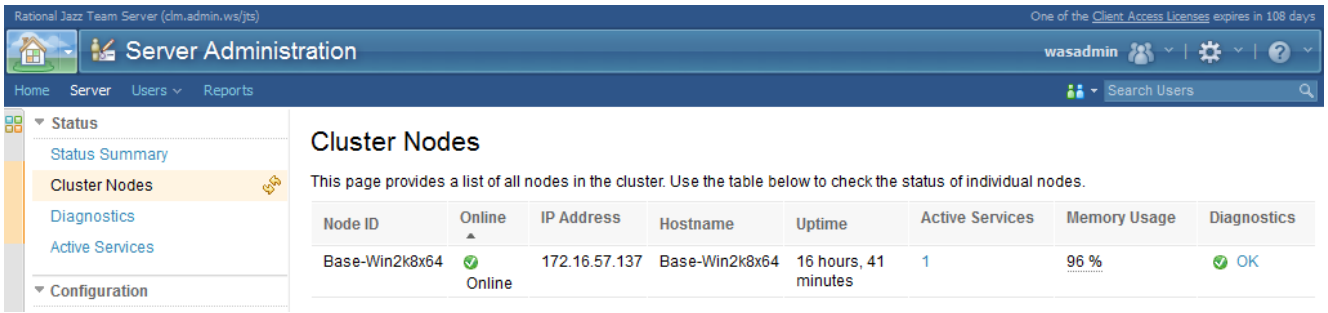
https://clm.admin.ws:9443/ccm/scr

https://clm.admin.ws:9443/qm/scr

https://clm.admin.ws:9443/rm/scr

https://clm.admin.ws:9443/admin/scr

__4. Once all the pages load then the one node cluster should be up. Navigate to https://clm.admin.ws/jts/admin and navigate to **Server > Cluster Nodes**. You should see the server1 cluster node:



4.7.4 Copy File system for CLMNode02

We need to copy JazzTeamServer to JazzTeamServer2 for use by CLMNode02. This only needs to be done once.

__1. Open a command prompt

__2. Type:

```
robocopy /MIR C:\AdminWS\IBM\JazzTeamServer C:\AdminWS\IBM\JazzTeamServer2
```

4.7.5 Start CLMNode02

__1. Go to deployment manager at https://clm.admin.ws:9043/ibm/console and log in as wasadmin/wasadmin.

__2. Navigate to **Servers > Server Types > Websphere application servers**, select “CLMNode02” and click **Start**

__3. Once the server starts hit the following URLs:

https://clmnode2.admin.ws:9444/jts/scr

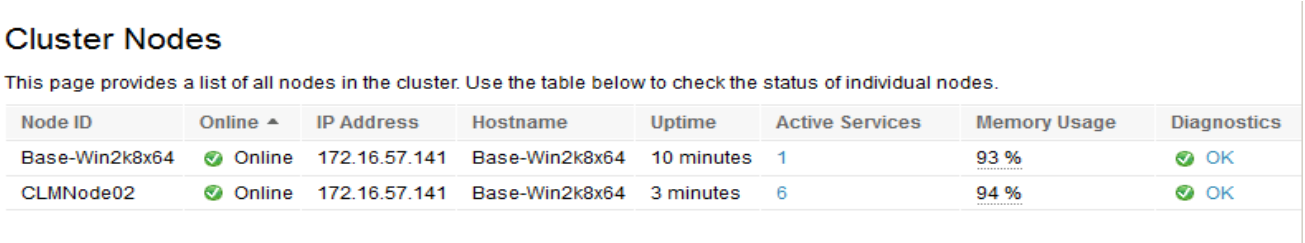
https://clmnode2.admin.ws:9444/ccm/scr

https://clmnode2.admin.ws:9444/qm/scr

https://clmnode2.admin.ws:9444/rm/scr

https://clmnode2.admin.ws:9444/admin/scr

__4. Once all the pages load then the one node cluster should be up. Navigate to https://clm.admin.ws/jts/admin and navigate to **Server > Cluster Nodes**. You should see the both cluster nodes.



Cluster Nodes

This page provides a list of all nodes in the cluster. Use the table below to check the status of individual nodes.

Node ID	Online ▲	IP Address	Hostname	Uptime	Active Services	Memory Usage	Diagnostics
Base-Win2k8x64	Online	172.16.57.141	Base-Win2k8x64	10 minutes	1	93 %	OK
CLMNode02	Online	172.16.57.141	Base-Win2k8x64	3 minutes	6	94 %	OK

4.8 Summary

In this lab you have evolved your CLM deployment topology adopting an enterprise level solution based on a CLM 2012 cluster. This clustered solution provides high-availability with automatic fail over capabilities.

4.9 Cleanup optional part of Lab 3

This section covers a series of steps to clean the optional part of the Lab 3 from your workshop machine to make your environment data match the instructions in this lab. You will basically move the JTS server back to the original location and remove the test server to free up the ports.

The steps to perform are the following:

__1. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Start the deployment manager**

__2. Open a window and navigate to **C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin**.

__3. Double-click ***startNode.bat***

__4. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**.

__5. Accept and confirm any security warnings.

__6. Login with wasadmin/wasadmin

__7. *Select* **Servers > Server Types > WebSphere application server**

__8. Move Jazz Team Server back to the original server:

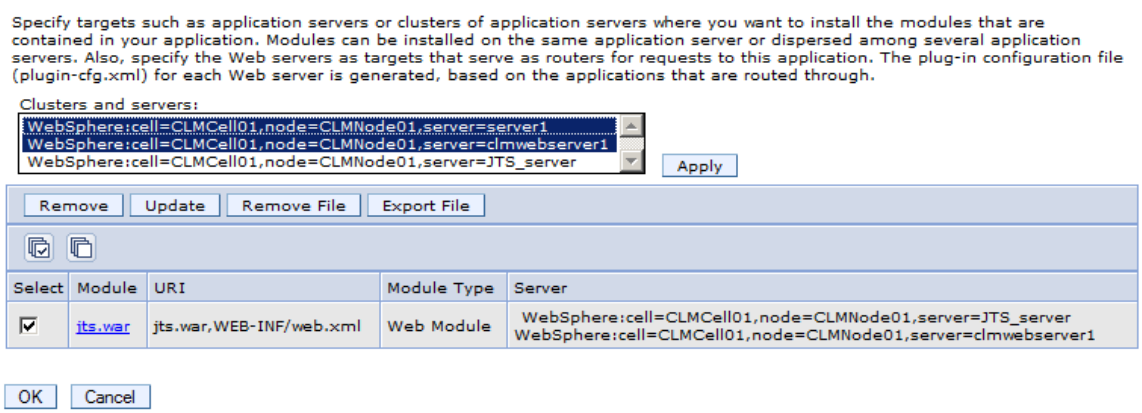
   __a. Click **JTS_server**

   __b. Click **Installed Applications** under *Applications*

   __c. Click **jts_war**

   __d. Click **Manage Modules** under *Modules*

   __e. Select the check box next to j*ts.war* and select *server1* and *clmwebserver1* (both), then click **Apply**



__f. Click **OK**

__g. Select **Save directly to the master configuration**

__9. Remove the server:

__a. Navigate to **Servers > Server Types > WebSphere application server**

__b. Select the check box next to *JTS_server* and click **Delete**

__c. Click **OK**

__d. Select **Save directly to the master configuration**

__10. Force a synchronization of the node:

__a. Navigate to *System Administration* > *Nodes*

__b. Select the checkbox near to *CLMNode01*

__c. Click **Synchronize**

Lab 5 Create a Staging Environment

In this lab, you will create a staging environment from your production data. The topology that will support this environment will be mirroring the enterprise topology we have set up in the previous laboratories of this same workshop.

It is usual that as your CLM installation grows you want to have a staging environment for testing based on real production data that will allow you to: test process improvements, test CLM upgrades or architectural changes, or just as training environment within your enterprise. For this environment to fulfill all these potential needs it is crucial to replicate the production configuration and data, and this is what you will do in this lab.

As part of the steps you will go through in the lab, you will be performing a rename of the public URI to define the service URL of the test environment.

The steps you will follow are:

1. Gather Public URI information from production
2. Create testing environment data
3. Setup the testing environment
4. Deploy CLM on the testing environment
5. Test the sandbox

Lessons Learned:

Have your CLM production environment replicated in a testing infrastructure.

CLM 2012 server rename feature key

In this lab you are going to perform a server rename operation as part of creating a test environment from production data. To be able to enable this capability you need a feature key from IBM Software Support. For more information regarding this process check Server rename overview

Lab 5 execution in the workshop!

This lab can be performed as a substitution of Lab 3, or after it. You will receive instructions when there are differences to take into account depending on your workshop labs execution order.

In case you have already performed Lab 3, including the optional step called “3.3 Sample case: moving JTS to a different server (Optional)”, please refer to the last section, 5.8, at the end of the lab.

5.1 Set up the virtual machine

The ideal setting for a staged environment is a completely isolated subnet with no visibility to the real production server were you can run your CLM installation with no risk of contaminating the production data. To try to emulate somehow this kind of environment, we will add a second IP address to the virtual machine an assign different names to the production and testing environments.

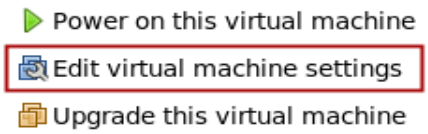
The easiest way of getting a second IP address is to add another network device for the virtual machine. The instructions for this varies for the particular operating system and version of VMWare being used by the host. The instructions that follow are for a Linux host using VMWare Workstation 8.0. Instructions for other combinations will be roughly the same.

After this is done you will find that the desktop information has been updated with two IP addresses. You will need to assign host names to both. Our original, clm.admin.ws and a new one clmtest.admin.ws.

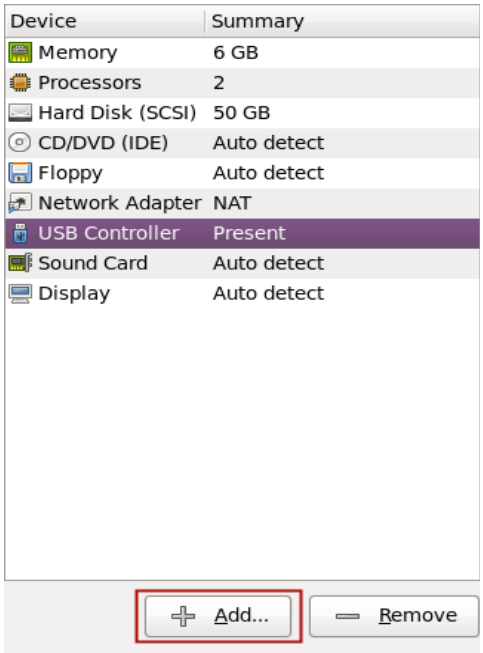
5.1.1 Adding a new NIC

__5. Shut down (not suspend) the virtual machine by shutting down the OS cleanly.

Once shut down click on **Edit virtual machine settings** in the virtual machine window

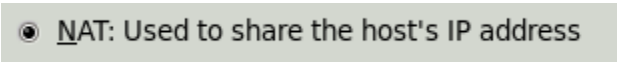


__6. Click the **Add...** Button



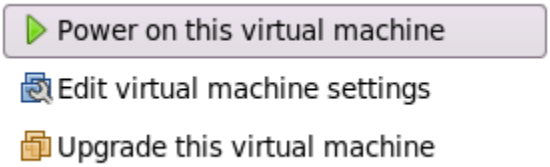
__7. Select “Network Adapter”

__8. Select “NAT: Used to share the host's IP address”



__9. Click the **Finish** button and then the **Save** button on the lower right corner

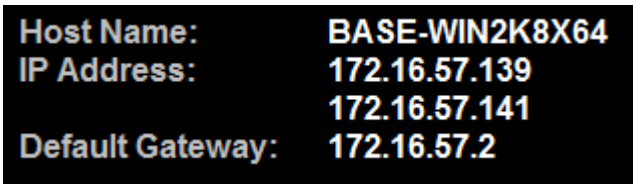
__10. Click **Power on this virtual machine**



5.1.2 Adding host names

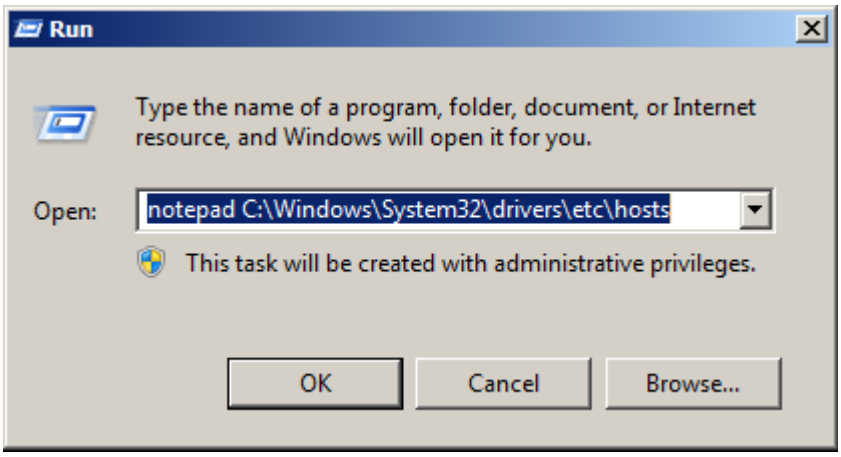
Once the virtual machine has rebooted, it is then necessary to modify the hosts file and add names to the two NIC's and there corresponding IP addresses as assigned by DHCP.

You will see the two IP addresses on the desktop information:
You will now need to add these ip addresses to your host file.



__1. Open the start menu and click **Run...**. Put the following command into the “Open:” field:

```
notepad C:\Windows\System32\drivers\etc\hosts
```



__2. Take note of the IPs on the desktop and assign the one with the smallest last segment to clm.admin.ws and the other to clmtest.admin.ws. For example:

```
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
```

```
#      102.54.94.97     rhino.acme.com          # source server
#       38.25.63.10     x.acme.com              # x client host

# localhost name resolution is handled within DNS itself.
#      127.0.0.1       localhost
#      ::1             localhost

172.16.57.139   clm.admin.ws
172.16.57.141   clmtest.admin.ws
```

Important!

If you reboot the virtual machine, you may need to repeat these stems as the DHCP lease may expire and new IP addresses are thereby assigned.

__3. Save and close the hosts file.

Important! Before you go ahead with the lab

In this lab you are cloning the entire CLM installation, you will need around 12 – 15 Gbs of free space on your VM machine. Try to free up some space erasing the *C:\AdminWS\downloads* folder or following the instructions in this resource to increase the size of your disk:

http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1007266

5.2 Gather Public URI information from Production

The staging environment you are building will need a new public URI to be set up. As the data for this environment will be a snapshot from production data, it will be referencing the public URI from production CLM installation; thus you will perform a rename as part of your staging set up operations. In this step we will generate the metadata needed for the rename:

__1. Start the production environment:

__a. Select *S***tart > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Start the deployment manager**

> **Start the IHS if needed**
> If you are performing this lab after Lab 3, you will need to start the IHS server at this point. Do so by opening a window and navigating to the path: *C:\AdminWS\IBM\HTTPServer\bin,* and double-click *httpd.exe*. Don't close the black screen that opens, it indicates that the IHS is up and running.

__b. Open a window and navigate to **C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin**.

__c. Double-click **startNode.bat**

__d. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**.

__e. Accept and confirm any security warnings.

__f. Login with wasadmin/wasadmin

__g. Select **Servers > Server Types > WebSphere application server**

__h. Select *server1* and click **Start**

__2. Generate the URL mapping file:

__a. Open a command prompt and navigate to the CLM installation path *C:\AdminWS\IBM\JazzTeamServer\server*

__b. Execute the following command to generate the mapping file for server rename:

```
repotools-jts -generateURLMappings
toFile=C:\AdminWS\IBM\JazzTeamServer\server\mappings.txt
adminUserId=adminws adminPassword=adminws
```

When the process has finished, check that the *mappings.txt* file exists in *C:\AdminWS\IBM\JazzTeamServer\server* folder.

__3. Stop the production server: we have gathered all the information we need from production, so we will free up resources for the testing environment:

__a. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**.

__b. Login with wasadmin/wasadmin

__c. Select **Servers > Server Types > WebSphere application server**

__d. Select “server1” and click **Stop**

__e. If you started the IHS server, close the black command window headed as “C:\AdminWS\IBM\HTTPServer\bin\httpd.exe”

5.3 Create testing environment data

A fully functional testing environment needs to mirror the production one both in data and installation configuration.

5.3.1 Clone production databases

We will create databases from the backups generated in the previous labs.

Information

To move the data from production to the testing environment you have to take a backup of your databases and recover them in your testing destination environment, which more likely will be a different database server from production.

We will demonstrate an example for recovering our workshop databases using DB2 commands. Adjust in your real environment based on your vendor tools and target database server and environment needs.

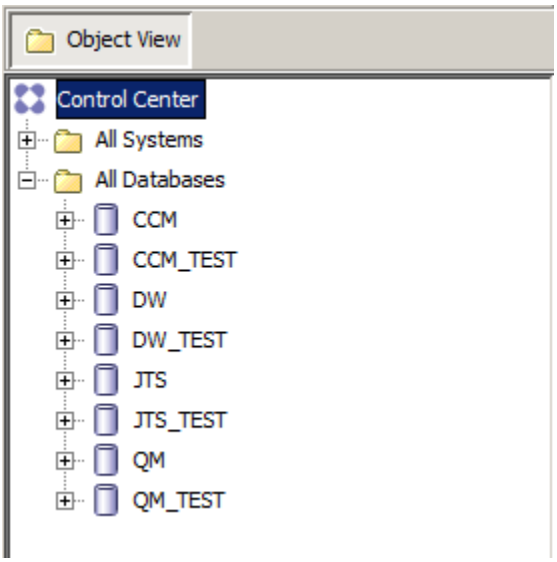
The steps to follow are:

__1. Launch the DB2 Command Editor by clicking **Start> All Programs > IBM DB2>DB2COPY1>Command Line Tools>Command Line Processor**

__2. Run the following command to create a clone of Jazz Team Server database from its backup:

```
restore database JTS from C:\AdminWS\backup to "C:" into JTS_TEST without
prompting
```

__3. Repeat the previous command for *CCM*, *QM* and *DW*, using: *CCM_TEST*, *QM_TEST* and *DW_TEST* as new databases names in each case. You will end up having the following databases:



__4. Close the DB2 Command Prompt window when finished

5.3.2 Clone Server Installation Data

Information: clone test installation

In your real environment you will be performing a clean installation in the testing environment and copying the application properties files and the text indices files. The files you will copy and replace from production would be:

- *teamserver.properties* files for *ccm*, *qm* and *jts* installations
- *admin.properties* and *friends.rdf* files for admin application installation
- *fronting.properties* and *friendsconfig.rdf* from rm application installation
- The whole indices directories as specified by the entries *com.ibm.team.fulltext.indexLocation* and *com.ibm.team.jfs.index.root.directory* in the *teamserver.properties* files

In this workshop you are copying the full installation to avoid repeating the whole installation process you already performed as part of the workshop.

The modifications to be performed in the files will be the same in this example as it would be in your real environment with a fresh test CLM installation.

__1. Create a “clone” installation of CLM solution.

__a. Open a command prompt

__b. Type:

```
robocopy /MIR C:\AdminWS\IBM\JazzTeamServer C:\AdminWS\IBM\JazzTeamServerTEST
```

__2. Update database connection string on teamserver.properties:

Important!

Note that we are going to just modify the database name as they are located in the same server as the production ones.

In your real environment you will have to modify the server connection URL string and the connection credentials information to match your testing environment database server.

Similar consideration has to be taken for the references to testing application installation path update that you are going to perform.

__a. Go to **C:\AdminWS\IBM\JazzTeamServerTEST\server\conf**. Notice there are directories for the CLM products, in particular *ccm*, *jts*, and *qm* (We are modifying the configuration files for the test installation, be careful to avoid modifying the production ones).

__b. Repeat the steps below for *ccm*, *qm* and *jts*:

__i. Open the *teamserver.propertes* files in the application folder for editing

__ii. Modify the database connection strings changing the original production database reference, to the just created ones for testing (ending with "_TEST"):

```
com.ibm.team.repository.db.jdbc.location=//clm.admin.ws:50000/DBx:user=db2
admin;password={password};
```

```
com.ibm.team.datawarehouse.db.jdbc.location=//clm.admin.ws:50000/DW:user=d
b2admin;password={password};
```

Change "DBx" name for the new "DBx_TEST" name. For example, for Jazz Team Server, change "JTS" for "JTS_TEST".

Chage as well "DW" for "DW_TEST".

__iii. Change the Data Warehouse folder to a test one:

```
com.ibm.team.datawarehouse.db.base.folder = C:\\AdminWS\\jazzdwTEST
```

__iv. Modify the index location references from the previous installation to the new replica one. Update the entries from:

```
com.ibm.team.fulltext.indexLocation=C:/AdminWS/IBM/JazzTeamServer/s
erver/conf/<APP>/indices/workitemindex
```

```
com.ibm.team.jfs.index.root.directory=C:/AdminWS/IBM/JazzTeamServer
/server/conf/<APP>/indices
```

To:

```
com.ibm.team.fulltext.indexLocation=C:/AdminWS/IBM/JazzTeamServerTE
ST/server/conf/<APP>/indices/workitemindex
com.ibm.team.jfs.index.root.directory=C:/AdminWS/IBM/JazzTeamServer
TEST/server/conf/<APP>/indices
```

Where <APP> is *rm*, *qm* or *ccm* in each case.

__3. Create a template from WAS server:

> **Information**
> We are creating this template as base for the test server to speed up the creation and configuration steps.
> In your real testing environment, you will have to install and configure WebSphere Application Server (you can refer to Lab 2 of this workshop).
> If your environment is compound of a base server and single node, you can try using wsadmin export and import profile facilities to ease the environment replication tasks.

__a. Select *Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console.*

__b. Login with wasadmin/wasadmin

__c. Select *Servers > Server Types > WebSphere application server*

__d. Select the check box next to *server1,* then click ***Templates...***

  __i. On the first screen click **New**

  __ii. Select *server1* and click **OK**

  __iii. Give the following values for the template creation:

    __a. Name: CLMAdminWStemplate

    __b. Description: WAS server template

__e. Click **OK** and then **Save directly to the master configuration**

5.4 Setup testing environment

At this point we have a clone CLM installation pointing to new databases with data from a snapshot from production. You are now going to create your test runtime environment and deploy the CLM solution in it.

Important!

Setting up a testing environment needs to be done in a separate infrastructure, with no disruption to real production data or performance impact.

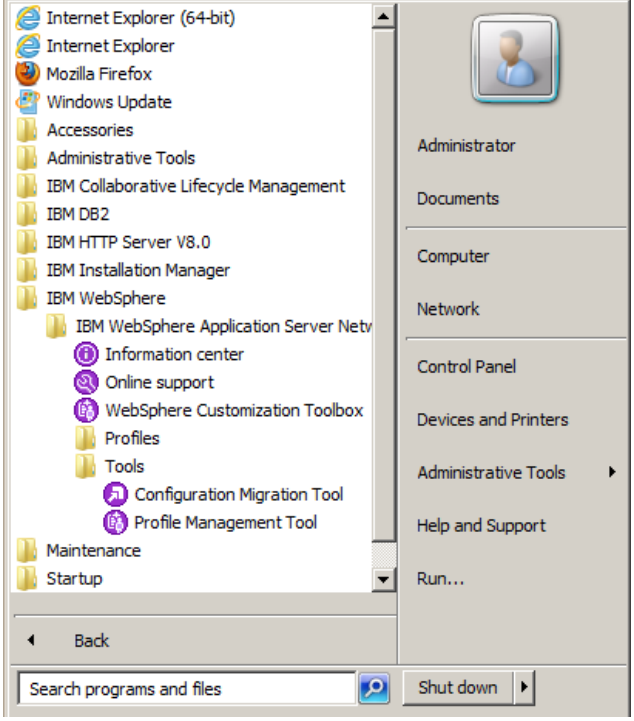
The configuration to be done in this workshop with the testing and production environments in the same box is just for demonstration purposes.

5.4.1 Create a WAS test server

In this step, you will create a second node to hold the test server installation. You will federate it to the CLM deployment manager just to be able to reuse the server template created.

__1. Create the Node:

__a. Select **Start >All Programs >IBM WebSphere >IBM WebSphere Application Server Network Deployment V8.0 > Tools > Profile Management Tool**



__b. Click **Create...**

__c. Select *Custom Profile* and click ***Next***

__d. Select *Advanced profile creation* and click **Next**

__e. Enter the following values and click **Next**:

- __i. Profile Name: “CLMTestSvr”
- __ii. Profile Directory: “C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMTestSvr”

__f. On the next step, enter the following values and then click **Next**:

- __i. Node name: “CLMTestNode”
- __ii. Host name: “clmtest.admin.ws”

__g. Enter the following values and click **Next**:

- __i. Deployment manager host name or IP address: “clm.admin.ws”
- __ii. Deployment manager SOAP port number: “8879”
- __iii. User name: “wasadmin”
- __iv. Password: “wasadmin”
- __v. Leave Federate this node later **unchecked**

__h. Click **Next** in the following three screens leaving the default values.

__i. Click **Create**.

__2. Create the test server within the new node:

__a. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console.**

__b. Login with wasadmin/wasadmin

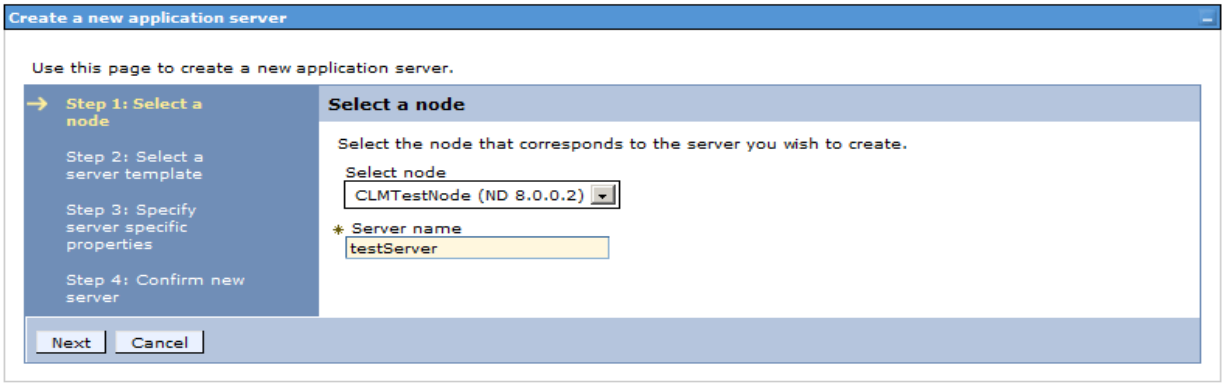
__c. Select **Servers > Server Types > WebSphere application server**

__d. Click **New...**

__e. In the first screen, fill these values and click **Next**:

__i. Select node: “CLMTestNode”

__ii. Server Name: “testServer”



__f. In Step 2, select the template: “CLMAdminWStemplate” and click **Next**.

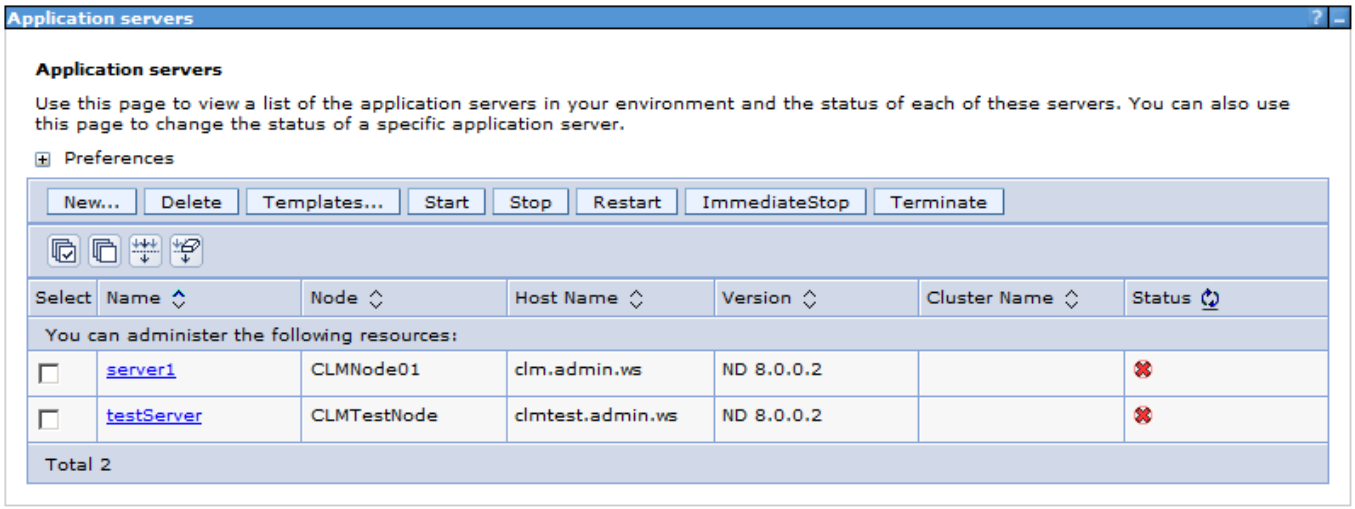
__g. In Step 3, make sure that *Generate unique ports* is **checked** and click **Next**.

__h. Click **Finish** in Step 4.

Information

Take in count that we are defining two mirror installations in a same box with 4GB JVM heap memory each. Be careful before starting both instances at the same time as it will fill up your VM resources.

__i. When prompted, click **Save directly to the master configuration.** You have now a second server in the test node.



__3. Modify custom properties for the test staging installation:

__a. Select *S***ervers > Server Types > WebSphere application server > testServer**

__b. Under *Server Infrastructure*, select **Java and Process Management > Process Definition***:*

__i. Set *Maximum heap size* to **4096** in case it has a different value

__ii. Click **Apply**

__c. Select *Custom Properties* (under *Additional Properties*).

__d. Modify “JAZZ_HOME” and “log4j.configuration” entries with the values of our testing environment (click **OK** after modifying each value):

__i. JAZZ_HOME: file:///C:/AdminWS/IBM/JazzTeamServerTEST/server/conf

__ii. log4j.configuration: file:///C:/AdminWS/IBM/JazzTeamServerTEST/server/conf

__e. When finished modifying both values, click **Save directly to the master configuration**

__4. Configure the virtual hosts for the servers:

__a. Within the WebSphere Administration Console, navigate to *Environment* > *Virtual Hosts*

__b. Click *default_host*

__c. Click *Host Aliases*

__d. Modify the *default_host* mappings to make them match the following image:

New... Delete

Select	Host Name	Port
You can administer the following resources:		
☐	clm.admin.ws	9080
☐	clm.admin.ws	80
☐	clm.admin.ws	9443
☐	clm.admin.ws	443
☐	clmtest.admin.ws	9081
☐	clmtest.admin.ws	9444
Total 6		

5.4.2 Prepare for test environment Public URI definition

In this step you will choose and perform the configuration steps to set the public URI of your testing environment. In a real case scenario you will more likely have a different server name and DNS name resolving to your test server, and this is what you would use for the public URI setting. You will emulate that configuration taking advantage of the hosts file customization performed at the beginning of this lab:

These configuration is performed modifying the mappings file generated from production to server as configuration file for the rename operation. The entries in the file have the following syntax:

```
# <Application or Context>
source=https://clm.admin.ws/<Context>
target=https://clm.admin.ws/<Context>
```

You have to modify the “target” entries of the file.

__a. Navigate to **C:\AdminWS\IBM\JazzTeamServerTEST\server**

__b. Open “mappings.txt” file

Information

Note that the file mappings.txt is in our test installation because this is a copy of the production installation. In your real environment you will need to copy this file from production and transfer it to your test server.

__c. Modify the URL of each entry beginning with *target=* from *clm.admin.ws* to *clmtest.admin.ws:9444.*

The mappings.txt file will end up having a content like the following:

```
#/qm
source=https://clm.admin.ws/qm
target=https://clmtest.admin.ws:9444/qm

#/rm
source=https://clm.admin.ws/rm
target=https://clmtest.admin.ws:9444/rm

# Additional Urls included in rename by /rm
#()
source=https://clm.admin.ws/converter/htmlgen
target=https://clmtest.admin.ws:9444/converter/htmlgen
#()
source=https://clm.admin.ws/clmhelp
target=https://clmtest.admin.ws:9444/clmhelp
#()
source=https://clm.admin.ws/dnghelp
target=https://clmtest.admin.ws:9444/dnghelp

#Lifecycle Project Administration
source=https://clm.admin.ws/admin
target=https://clmtest.admin.ws:9444/admin
```

```
#/ccm
source=https://clm.admin.ws/ccm
target=https://clmtest.admin.ws:9444/ccm

#clm.admin.ws/jts
source=https://clm.admin.ws/jts
target=https://clmtest.admin.ws:9444/jts

# Additional Urls included in rename by clm.admin.ws/jts
#(CLM Help URL)
source=https://clm.admin.ws/clmhelp/index.jsp
target=https://clmtest.admin.ws:9444/clmhelp/index.jsp

# Urls which are affected by this rename event
# https://clm.admin.ws/rm/rootservices (Friend Entry)
# https://clm.admin.ws/ccm/rootservices (Friend Entry)
# https://clm.admin.ws/qm/rootservices (Friend Entry)
# https://clm.admin.ws/rm/rootservices (Friend Entry)
```

5.5 Deploy CLM on test environment

In this point we are going to deploy CLM in our second WAS server and perform the public URI modification. Take in count that while this example shows the end-to-end process in an “all in one box” scenario, in a real environment you will end up having a new CLM installation with its own service URI mirroring in data and configuration the production environment.

5.5.1 Install the feature key

To enable the CLM 2012 server rename capability, you have received a feature key from IBM support. This feature key has to be placed in the JAZZ_HOME folder so it is recognized by the “importURLMappings” command *C:\AdminWS\IBM\JazzTeamServer\server\conf*

5.5.2 Perform the Public URI set for the new environment

Follow these steps:

__1. Open a command prompt and navigate to the folder **C:\AdminWS\IBM\JazzTeamServerTEST\server**

__2. Execute the following command:

```
repotools-jts -importURLMappings fromFile=mappings.txt
```

> **Errors executing “importURLMappings”?**
> If you receive an error type of “*CRJAZ2459E Error: To enable this feature you must obtain a key file from IBM sup port.*” means that the feature key is not placed in the correct path. Place the feature key in the JAZZ_HOME folder.

__3. You will receive a confirmation message, type **Y** and press **Enter** to proceed:

```
CRJAZ2281I The mapping file contains an entry for the public URL of this
server.
  Are you sure that you want to change the public URL of this server from
"https
://clm.admin.ws/jts" to "https://clmtest.admin.ws:9444/jts"?  Enter Y to
confirm
```

When an operation success message is received, the applications' URLs will be prepared to be modified at the next server start.

5.5.3 Deploy CLM on test staging

You are going to deploy in your WAS staging server the CLM solution for the testing environment. The steps to follow are:

> **Information**
> Because we are defining our mirror testing environment in the same WAS Cell, we need to modify the application name in the deployment process.

__1. Log in to WAS Administration Console if not already there:

   __a. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**

   __b. Accept any security warnings

   __c. Use *wasadmin / wasadmin* as user and password

__2. Select **Applications > New Application > New Enterprise Application.**

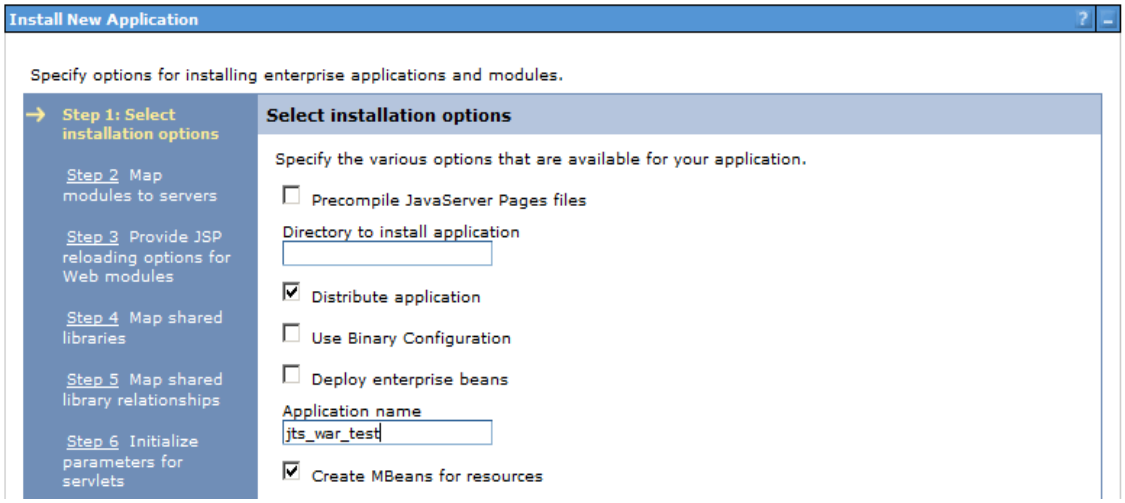
__3. Select Remote file system, **Browse...**, then *CLMCellManager01*. Then browse to *C:\AdminWS\IBM\JazzTeamServerTEST\server\tomcat\webapps*.

__4. Select *jts.war*, and select **OK**, and the click **Next**.

__5. Select *Detailed* as the installation method, then click **Next** and **Continue** in the following screen.

__6. Perform the following changes in the installation steps (leave default values for any step not mentioned below):

   __a. Step 1: change application name to not collide to our production installation. For example, add a "_test" string at the end of the application name, from *jts_war* to *jts_war_test*



__b. Step 2: select *stgServer* definition; then select the *jts.war* module, and click on **Apply**. Once the jts.war module has been assigned the mapping, click **Next**.

__c. Step 7: Leave default_host as the Virtual host

__d. Step 8: put "/jts" as the context root.

__e. Step 9: we will map at deployment time the security Jazz roles with our Active Directory LDAP.

__i. Select JazzAdmins and click on **Map Groups**

__ii. In the search string type "JazzAdmins*" and click Search

__iii. Select the JazzAdmins group in the *Available* box, and click on the arrow to move it to the *Selected* box.

__iv. Repeat steps i-iii with the rest of roles looking for the groups called "JazzUsers", "JazzGuests", "JazzDWAdmins" and "JazzProjectAdmins". You will end up having the following mapping:

Map Users... | Map Groups... | Map Special Subjects

Select	Role	Special subjects	Mapped users	Mapped groups
☐	JazzAdmins	None		CN=JazzAdmins,CN=Users,dc=clm,dc=admin,dc=ws
☐	JazzDWAdmins	None		CN=JazzDWAdmins,CN=Users,dc=clm,dc=admin,dc=ws
☐	JazzUsers	None		CN=JazzUsers,CN=Users,dc=clm,dc=admin,dc=ws
☐	JazzGuests	None		CN=JazzGuests,CN=Users,dc=clm,dc=admin,dc=ws
☐	JazzProjectAdmins	None		CN=JazzProjectAdmins,CN=Users,dc=clm,dc=admin,dc=ws

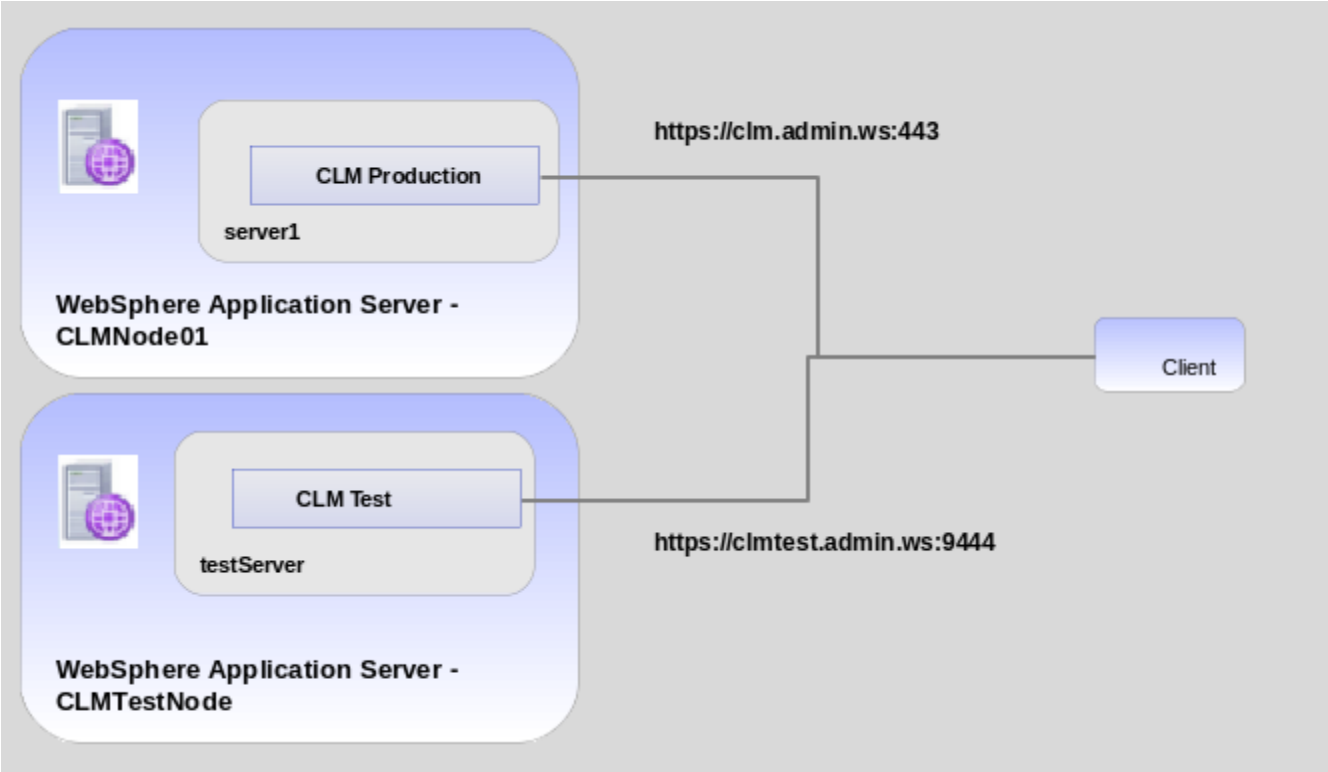
__f. Step 12: click **Finish** in the Summary page.

__g. Click **Save to master configuration to finish de application deployment.**

__7. Repeat steps 2-6 for the rest of CLM modules (*admin.war, ccm.war, clmhelp.war, converter.war, qm.war* and *rm.war*); with the following considerations:

- Don't forget to modify the application name in step one. For example, adding "_test" to the applications.
- The context roots are: */admin, /ccm, /clmhelp, /converter, /qm, /rm*
- The only applications that need the roles mapping to be defined are *ccm.war*, *jts.war* and *qm.war*

The result of these steps are mirror CLM deployment installations being served with different URIs:


CLM Production
server1
WebSphere Application Server - CLMNode01
https://clm.admin.ws:443
Client
CLM Test
testServer
https://clmtest.admin.ws:9444
WebSphere Application Server - CLMTestNode

5.6 Test the sandbox

At this point you have cloned your CLM installation with data from production. You want now to finalize the server rename process to have your test environment up and running.

First of all, start the test server:

__a. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**

__b. Accept and conform to any security warnings

__c. Login as wasadmin/wasadmin

__d. Select **Servers > Server Types > Application Servers**

__e. Select *testServer* and click **Start**

__f. Once the server has started, click **Logout**.

Production and test environments running

Note that if you configure the VM machine in which you are running this lab with enough memory resources, you could start both servers and have your production and test CLM installations running at the same time, using different service URIs and different data from a common snapshot.

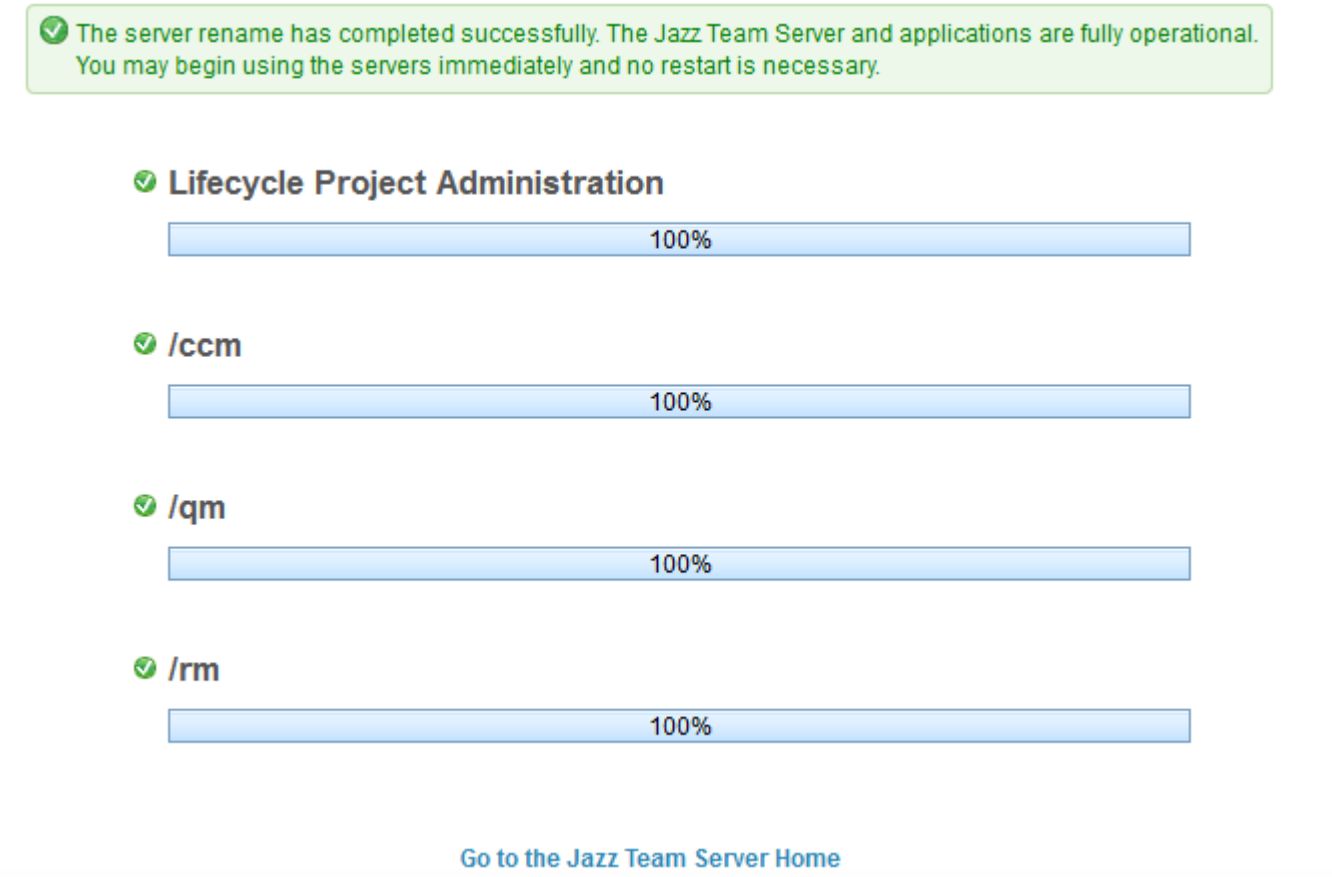
Now you have started our CLM test environment you are ready to make a health check for the two important steps performed to build it:

- The Public URI setting status: till this process is complete the access to CLM will be denied
- Check that the data moved from production is there and stable

5.6.1 Public URI set-up Status

Open a web browser and navigate to https://clmtest.admin.ws:9444/jts/serverRenameStatus (use adminws / adminws to log in to the application). In that page you will be able to check the status of the process and see when it completes to begin working with CLM.

Note that you won't be able to begin your work with the new CLM installation until the public URI set process finishes.



5.6.2 Health Check

Perform some basic sanity checks to make sure your testing environment is ready for work:

__1. Navigate to https://clmtest.admin.ws:9444/jts/admin and check that the CLM applications appear in the bottom of the screen.

__2. Navigate to https://clmtest.admin.ws:9444/admin/web/projects and check that the links between the JKE Banking application project areas for each CLM application are resolved

__3. From the Home menu, select Change and Configuration Management > JKE Banking (Change Management) and check that the dashboard loads

__4. Repeat the previous operations accessing the JKE Banking Project Area for the Quality Management and Requirements Management applications.

5.7 Summary

In this lab you have built a test environment using data from production. In the process of building the testing environment you have performed a server rename to generate a new Public URI for this second CLM installation.

This lab serves as a practical example of how you can generate a fully functional test environment. It has the advantage of using real data from production which allows you to use this kind of test environments to check the impact on production of changes planned in production, or to test the adoption of new practices.

5.8 Cleanup optional part of Lab 3

This section covers a series of steps to clean the optional part of the Lab 3 from your workshop machine to make your environment data match the instructions in this lab. You will basically move the JTS server back to the original location and remove the test server to free up the ports.

The steps to perform are the following:

__1. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Start the deployment manager**

__2. Open a window and navigate to **C:\AdminWS\IBM\WebSphere\AppServer\profiles\CLMAppSrv01\bin**.

__3. Double-click ***startNode.bat***

__4. Select **Start > All Programs > IBM WebSphere > IBM WebSphere... > Profiles > CLMDMgr01 > Administrative Console**.

__5. Accept and confirm any security warnings.

__6. Login with wasadmin/wasadmin

__7. *Select* **Servers > Server Types > WebSphere application server**

__8. Move Jazz Team Server back to the original server:

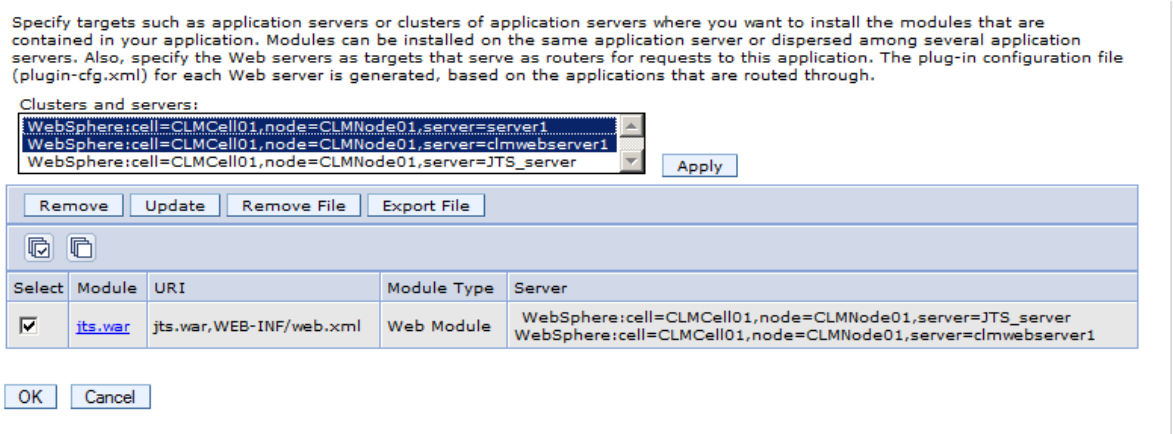
   __a. Click **JTS_server**

   __b. Click **Installed Applications** under *Applications*

   __c. Click **jts_war**

   __d. Click **Manage Modules** under *Modules*

   __e. Select the check box next to j*ts.war* and select *server1* and *clmwebserver1* (both), then click **Apply**



__f. Click **OK**

__g. Select **Save directly to the master configuration**

__9. Remove the server:

__a. Navigate to *Servers* > *Server Types* > *WebSphere application server*

__b. Select the check box next to *JTS_server* and click **Delete**

__c. Click **OK**

__d. Select **Save directly to the master configuration**

__10. Force a synchronization of the node:

__a. Navigate to *System Administration* > *Nodes*

__b. Select the checkbox near to *CLMNode01*

__c. Click **Synchronize**

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