WebSphere Lab Jam Application Infrastructure WebSphere Application Server V8 Administration

Lab Exercise



IBM

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Contents

LAB 1	WEBS	PHERE APPLICATION SERVER V8 INSTALLATION AND CONFIGURATION	7
	1.1	LAB REQUIREMENTS	7
	1.2	WHAT YOU SHOULD BE ABLE TO DO	7
	1.3	INTRODUCTION	8
	1.4	Exercise Instructions	8
	1.5	DEPLOYING A WEBSPHERE APPLICATION SERVER DEPARTMENTAL SOLUTION.	9
	1.6	Adding Clustering to the Departmental Deployment	59
LAB 2		NISTERING AN OSGI APPLICATION	68
	2.1	Before you begin	
	2.2	ABOUT THE APPLICATION YOU WILL DEPLOY	68
	2.3	A CLOSER LOOK AT THE OSGI APPLICATION	68
	2.4	CONVENTIONS	69
	2.5	PART 1: START THE WAS ENVIRONMENT	69
	2.6	PART 2: DEPLOY THE OSGI BANKING APPLICATION WEB APP	73
	2.7	Part 3: Use the OSGI BankingApplication Web app	
	2.8	PART 4: DEPLOY AN UPDATE TO THE OSGI BANKINGAPPLICATION WEB APP	
	2.9	PART 5: VALIDATE THE UPDATED OSGI BANKINGAPPLICATION WEB APP	
	2.10	Conclusions	
LAB 3	HIGH	PERFORMANCE EXTENSIBLE LOGGING	
	3.1	LAB REQUIREMENTS	
	3.2	WHAT YOU SHOULD BE ABLE TO DO	
	3.3	INTRODUCTION	
	3.4	Exercise Instructions	
	3.5	ENABLE AND CONFIGURE HPEL.	
	3.6	USE THE HPEL COMMAND LINE LOG VIEWER	
	3.7	Use the HPEL log viewer included in the WebSphere administrative console	109
APPENDIX A.	COMN	ION TASKS	7
APPENDIX B.	ΝΟΤΙΟ	ES	129
APPENDIX C.	TRAD	EMARKS AND COPYRIGHTS	

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Lab 1 WebSphere Application Server V8 Installation and Configuration

The objective of this lab is to provide you with an understanding of the basic WebSphere Application Server and WebSphere Application Server – Network Deployment infrastructure. Within the constraints of the machine image available for the exercise you'll configure a typical WAS environment comprised of an HTTP server, WebSphere Application Server, DB2 database server and LDAP server for application use. You'll then add a WAS-ND Deployment Manager and federate the application server environment into WAS-ND to adding scalability, failover, and centralized management to your environment.

This lab is provided **AS-IS**, with no formal IBM support.

1.1 Lab requirements

WebSphere Application Server – Network Deployment Version 8.0

1.2 What you should be able to do

At the end of this lab you should be able to

- Install WebSphere Application Server using IBM Installation Manager and configure WebSphere Application Server for a departmental deployment on a single server
- Configure a WebSphere Application Server Network Deployment cluster for a departmental deployment on a single server
- Configure WAS and WAS -ND to use DB2 for application data
- Configure a Federated Repository for WAS and WAS-ND to use an LDAP server for user authentication.

1.3 Introduction

This lab is intended as a primer on the basic configuration of WebSphere Application Server for those not already familiar with it, or a refresher for those already skilled in WebSphere Application Server.

The aim of the lab is to walk though the steps that a systems administration would perform for a typical WebSphere Application Server (and WAS-ND) deployment, using the information typically provided or dictated by organizational standards; e.g. installation location, database configuration, LDAP configuration.

1.4 Exercise instructions

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

Reference variable	Windows [®] location	$Linux^{ entropyee}$ or $UNIX^{ entropyee}$ locations
<was_home></was_home>	C:\IBM\WebSphere\AppServer	/usr/WebSphere/AppServer /opt/WebSphere/AppServer
<pre><profile_home></profile_home></pre>	C:\IBM\WebSphere\AppServer\profiles\AppSrv01	/usr/WebSphere/AppServer/profiles/AppSr v01 /opt/WebSphere/AppServer/profiles/AppSr v01
<rad_home></rad_home>	C:\Program Files\IBM\SDP	/opt/IBM/SDP
<lab_files></lab_files>	C:\Labfiles80	/Labfiles80
<temp></temp>	C:\temp	/tmp

Note for Windows users: When directory locations are passed as parameters to a Java program such as EJBdeploy or wsadmin, it is necessary to replace the backslashes with forward slashes to follow the Java convention. For example, C:\Labfiles80\ would be replaced by C:/Labfiles80/

1.5 Deploying a WebSphere Application Server Departmental Solution.

This lab will assume that an departmental application infrastructure; consisting of an HTTP Server and WebSphere Application Server instance, needs to be deployed and configured to use LDAP, and a DB2 database, needs to be deployed in an environment as depicted below.

Since the enterprise is providing a proxy server in the DMZ in order to provide for security we will be configuring the HTTP server to run on the same server as the application server and will thus be able to safely and securely leverage the WebSphere Application Server capability to manage IBM HTTP Server.

As is often the case in many enterprises, much of the infrastructure is outside the domain of the application server administration team. While most often the LDAP server and Database server are located on external servers, for the purposes of this lab both will be located on the same server as the application server, though the actual administration of LDAP and DB2 performed by others, while the WAS configuration to use these services will be part of this exercise.



1. Take a VM snapshot (to insure you have a recovery point), provide a meaningful same such as "starting image"



- ____ 2. Start the Virtual Machine image
 - ____a. Log in using "root" with the password "password"

Typically you wouldn't log in using "root." Since most of the lab is administrative activities, it makes sense to log in as "root" in this environment. Please don't use root for regular access on your servers.

3. WAS V8 has a new installer, called the "IBM Install Manager". The Install Manager must first be installed, before installing WAS itself. The following instructions will show you how to install the IBM Install Manager.



____ b. Open a command window

___ c. Navigate to the directory with the install image of Install Manager # cd /Labfiles80/IBM_IM

____ d. Run the Install Manager install # ./install



Install Packages		
Select packages to install:		
Installation Packages	Status Vend	lor License Key Type
▼ 🗹 🗊 IBM® Installation Manager		
🗹 🕠 Version 1.4.4	Will be installed IBM	No key required
Show <u>a</u> ll versions		for Other Versions, Fixes, and Extensio
☐ Show <u>a</u> il versions Details		for Other Versions, Fixes, and Extensio
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Show <u>a</u> ll versions Details IBM Installation Manager 1.4.4 IBM Installation Manager More info Repository: /Labfiles80/IBM_IM	Check	for Other Versions, Fixes, and Extensio
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Show <u>a</u> ll versions Details IBM © Installation Manager 1.4.4 IBM © Installation Manager <u>More info</u> • Repository: /Labfiles80//BM_IM	Check	for Other Versions, Fixes, and Extensio
Show <u>a</u> ll versions Details IBM © Installation Manager 1.4.4 IBM © Installation Manager <u>More info</u> • Repository: /Labfiles80/IBM_IM	Check	for Other Versions, Fixes, and Extensio

You'll see the following screens. Take the defaults as illustrated in the images below

IBM Installation Manager	
nstall Packages	
Read the following license agreements carefully.	7
Install Licenses Location Summary	
nternational Program License Agreement	
Part 1 - General Terms	
BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, CLICKING ON AN "ACCEPT" BUTTON, OR OTHERWISE USING THE PROGRAM, LICENSE AGREES TO THE TERMS OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS ON BEHALF OF LICENSEE, YOU REPRESENT AND WARRA THAT YOU HAVE FULL AUTHORITY TO BIND LICENSEE TO THESE TERMS. IF YOU DO NOT AGREE TO THESE TERMS,	E NT
DO NOT DOWNLOAD, INSTALL, COPY, ACCESS, CLICK ON AN "ACCEPT" BUTTON, OR USE THE PROGRAM; AND	
PROMPTLY RETURN THE UNUSED MEDIA, DOCUMENTATION, AND PROOF OF ENTITLEMENT TO THE PARTY FROM WHOM IT WAS OBTAINED FO A REFUND OF THE AMOUNT PAID. IF THE PROGRAM WAS DOWNLOADED, DESTROY ALL COPIES OF THE PROGRAM.	DR
1. Definitions	
'Authorized Use" - the specified level at which Licensee is authorized to execute or run the Program. That level may be measured by numbe of users, millions of service units ("MSUs"), Processor Value Units ("PVUs"), or other level of use specified by IBM.	r
'IBM" - International Business Machines Corporation or one of its subsidiaries.	
'License Information" ("LI") - a document that provides information and any additional terms specific to a Program. The Program's Li is availa at www.lbm.com/software/sla. The Li can also be found in the Program's directory, by the use of a system command, or as a booklet include with the Program.	ble ed
Program" - the following, including the original and all whole or partial copies: 1) machine-readable instructions and data, 2) components, fil and modules, 3) audio-visual content (such as images, text, recordings, or pictures), and 4) related licensed materials (such as keys and	es,
I accept the terms in the license agreement	t All.
I do not accept the terms in the license agreement	
Next > Install C	Canc

		IBM Installation Manager	
Install Packa	ages		-1
Select a location	for Installation	Manager.	7
Install	Licenses	Location Summary	
Once ir	nstalled, IBM Inst	allation Manager will be used to install, update, modify, manage and uninstall your packages.	
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Volume	Available	e Space	
/		7.06 GB	
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	Manager	
Install Packages		
Review the summary information.		7
Install Licenses Location Summary		
Target		
Package Group Name: IBM Installation Manager		
Installation Directory: /opt/IBM/InstallationManager/eclipse		
Packages		
Packages		
🗊 IBM® Installation Manager 1.4.4		
Environment	Disk Space Information	
Environment Arabic, Brazilian Portuguese, Czech, Danish, English, French, German,	Disk Space Information	Total Available Space
Environment Arabic, Brazilian Portuguese, Czech, Danish, English, French, German, Greek, Hungarian, Italian, Japanese, Korean, Lithuanian, Polish, Russian, Simplified Chinese, Slovenian, Spanish, Traditional Chinese, Turkish	Disk Space Information	Total Available Space 7.06 GB
Environment Arabic, Brazilian Portuguese, Czech, Danish, English, French, German, Greek, Hungarian, Italian, Japanese, Korean, Lithuanian, Polish, Russian, Simplified Chinese, Slovenian, Spanish, Traditional Chinese, Turkish	Disk Space Information / Total Download Size: 115.90 MB Total Installation Size: 210.25 MB	Total Available Space 7.06 GB
Environment Arabic, Brazilian Portuguese, Czech, Danish, English, French, German, Greek, Hungarian, Italian, Japanese, Korean, Lithuanian, Polish, Russian, Simplified Chinese, Slovenian, Spanish, Traditional Chinese, Turkish • Repository Information	Disk Space Information / Total Download Size: 115.90 MB Total Installation Size: 210.25 MB	Total Available Space 7.06 GB

٩	IBM Installation Manager	_ • ×
Install Packages		-
	The packages are installed. <u>View Log File</u>	
	The following package was installed:	
	▽ 🖏 IBM Installation Manager	
	🗊 IBM® Installation Manager 1.4.4	
	Click on "Restart Installation Manager" to launch the new Installation Manager and to start installation of other package(s).	-
0		Restart Installation Manager

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After it is installed you can also launch Install Manager as shown below:



Now that Install Manager is in place you can start installing a wide range of IBM products. Install manager does need to know where to find the install images. The images are

stored in a repository. The next steps will show how to configure Install Manger to access a repository that has been built for you for this lab.

- Applications Places System **IBM Installation Manager** <u>File</u><u>H</u>elp <u>O</u>pen ٠ nager 📒 <u>V</u>iew Log 📃 Installation History 📃 View Installed <u>P</u>ackages Preferences... E<u>x</u>it Install Install software packages. Update Manage Li Discover and install updates and fixes to installed
- ___ e. Click File -> Preferences for the IBM Installation Manager Preferences as shown below

____f. Click " Add Repository "

Applications Places	System		
۵	Pr	eferences	×
	Repositories		<> → → ▼
Repositories Appearance Files for Rollback Help Internet Passport Advantage Updates	Repositories:	Connection	I Repository t Repositor oye Repository Move Up

____g. Browse to the **/opt/media/IMRepository** directory, and select the **repository.config** file, and click **"OK"**

)	Select a Repository	y
Media MRepo	sitory	
<u>P</u> laces	Name	▼ Modified
豫 root	芦 atoc	08/29/2011
😻 Desktop	芦 features	09/09/2011
🗇 File System	芦 files	09/11/2011
🖔 Floppy Drive	📁 lost+found	08/29/2011
	📁 native	09/11/2011
	📁 Offerings	09/11/2011
	📁 plugins	09/11/2011
	🜔 repository.config	09/11/2011
		-
Add	reposit	tory.config;diskTag.inf;*.jar;*.zip
		X Cancel

____h. Repeat the previous step to add a repository for iFix. Browse to the **/wasmaint** directory, select the **8.0.0.0-WS-WASND-IFPM44786.zip** file, and click **OK**

Places	Name	 Modified
豫 root 參 Desktop ☆ File System ☆ Floppy Drive	1.0.0.0-WS-WASND-IFPM44786.zip	10/06/2011
🖨 Add 📄 Remo	ve repository.config;disk	

_____ i. Test the connection to the repository with the "Test Connection" button



____j. Your Installation Manager screen should now look like the image below. At this point we are ready to start installing software that exists in the repository.

type filter text Repositories Appearance Files for Rollback > Help > Internet Passport Advantage Updates Wove Do Clear Crede Test Connect Service repositories are remote locations where updates or extensions to packages (including the last service)		Preferences	8
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Jest Connect Service repositories are remote locations where updates or extensions to packages (including the Ins		Slean	Credentials
Service repositories are remote locations where updates or extensions to packages (including the Ins		Test	Connections
Manager itself) are stored. Search service repositories during installation and updates. Restore Defaults	SK M. R	is are remote locations where updates or extensions to packages (including stored. repositories during installation and updates. Restore Defaults	the Installation
		Trestore <u>D</u> erours	
ОК Са		ОК	Cancel

____k. Click "OK" to return to the Install Manager home.

- 4. Install WebSphere Application Server
 - ___I. Click Install from the Installation Manager

IBM Installation Manager



____m. Select the software to install as show below then click **Next**.

IBM Installa	tion Manager							
Install Packages								
Select packages to install:								
Installation Packages	Status	Vendor	License Key Type					
🗢 🗹 🧃 IBM HTTP Server for WebSphere Applicatio	n Ser							
🗹 🕅 Version 8.0.0.0	Will be installed	IBM						
マ 🗹 🧊 IBM WebSphere Application Server Networ	k Der							
🗹 🕅 Version 8.0.0.0	Will be installed	IBM						
🗢 🗹 🧊 Web Server Plug-ins for IBM WebSphere Ap	plica							
🗹 😱 Version 8.0.0.0	Will be installed	IBM						
🗢 🗹 🧊 WebSphere Customization Toolbox								
☑ 🕼 Version 8.0.0.0	Will be installed	IBM						
Show <u>a</u> ll versions	Check for	Other Versions, Fixe	es, and Extensions					
Details								
IBM HTTP Server for WebSphere Application	1 Server 8.0.0.0		_					
IBM HTTP Server for WebSphere Application Server provides advanced web server capabilities with consistent management and security in a WebSphere Application Server environment. IBM HTTP Server for WebSphere Application Server is based on Apache HTTP Server. More info								
Renository: /media/IMRenository			•					
D	< <u>B</u> ack	Next >	stall Cancel					

____n. Select the fix and click **OK**.

Install Packages				-5
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🗹 🧊 8.0.0.0-WS-V	WASND-IFPM44786 8.0.0.20110804_1105			
			Check for Oth	ner Fixes
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Details IBM WebSphere Appl	ication Server Network Deployment 8.0.0.	•	<u>C</u> heck for Oth	ner Fixes
Details IBM WebSphere Appl IBM WebSphere Applicat	ication Server Network Deployment 8.0.0.	0 ady Java Platfo	<u>C</u> heck for Oth	ner Fixes
Details IBM WebSphere Appl IBM WebSphere Applicat Edition (Java EE) complia	Ication Server Network Deployment 8.0.0. ion Server Network Deployment is a production-re- ant application server for the deployment of enterp	0 ady Java Platfo rrise web servi	<u>Check for Oth</u> rm, Enterprise ces solutions f	her Fixes
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____o. Select Accept the License and Click Next

Install Packages	-
Read the following license agreements carefully.	
Install Licenses Location Features Summary	
International Program License Agreement	
Part 1 - General Terms	-
BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, CLICKING ON AN "ACCEPT" E AGREES TO THE TERMS OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS THAT YOU HAVE FULL AUTHORITY TO BIND LICENSEE TO THESE TERMS. IF YOU DO N	BUTTON, OR OTHERWISE USING THE PROGRAM, LICENSEE ON BEHALF OF LICENSEE, YOU REPRESENT AND WARRANT IOT AGREE TO THESE TERMS,
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"IBM" - International Business Machines Corporation or one of its subsidiaries.	
"License Information" ("LI") - a document that provides information and any additiona at www.ibm.com/software/sla. The Ll can also be found in the Program's directory, b with the Program.	al terms specific to a Program. The Program's LI is available y the use of a system command, or as a booklet included
I <u>a</u> ccept the terms in the license agreement	Print All
O I go n ot accept me terms in the license a greement	

____p. Select Shared Resources Directory **/opt/IBM/IMShared** and click **Next**.

	IBM Installation Manager	
Install Packages		-5
Select a location for the shar	red resources directory.	7
Install Licenses	Location Features Summary	
When you install pa	ickages, files are stored in two locations:	
1) The shared resou	urces directory - resources that can be shared by multiple packages.	
2) The installation di	irectory - any resources that are unique to the package that you are installing.	
Important: You can	only select the shared resources directory the first time you install a package with	the IBM
Installation Manager space for the share	f. For best results select the drive with the most available space because it must had resources of future packages.	ave adequate
Shared Besources Directory:	/opt/IBM/IMShared	Browse
Disk Space Information		
Volume Available Space		
/ 6.82 GB		
h	- Back North	Cancel

____ q. Accept the default for the package group installation and directory. Click Next.

IBM	Installation Manager	
Install Packages	ž.	
The packages will be installed into the ind the installation directory.	icated package groups. Select the package group to change 🌱	
Install Licenses Location	1 Features Summary	
Package Group Name	Installation Directory	-
🔻 🍾 IBM HTTP Server V8.0	/opt/IBM/HTTPServer	=
 IBM HTTP Server for WebSphere A * % IBM WebSphere Application Server f マ () IBM WebSphere Application Server 	Application Ser Jetwork Deploy /opt/IBM/WebSphere/AppServer er Network Der	
4		
Package Group Name: IBM HTTP Server V	8.0	
Installation <u>D</u> irectory: /opt/IBM/HTTPSer	/er B <u>r</u> owse	
Details	Disk Space Information	
Shared Resources Directory: /opt/IBM/IMS	hared Volume Available Space	
	/ 6.82 GB	
)	< Back Next > Install Canc	:el

____r. Accept the default for Language and click Next.

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Select the translations to in	nstall.			4
Install Licenses	Location Fe	atures St	ummary	
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Translations Support Brazilian Portuguese Italian Russian	ced by Only Some	 ☐ Erench ☐ Korean ☐ Spanish 	German Polish Traditional Chinese	Hungarian Romanian

____s. Select the packages to install as shown below and click **Next**.

IBM	Installation Manager -
Install Packages	-
Select the features to install.	
Install Licenses Location	Features Summary
Features	
🗹 🧊 IBM HTTP Server for WebSphere Ap	pplication Server 8.0.0.0
🗢 🖃 🧊 IBM WebSphere Application Server	Network Deployment 8.0.0.0
EJBDeploy tool for pre-EJB 3.0 m	nodules
🕨 🗖 🇞 Stand-alone thin clients, resourc	ce adapters and embeddable containers
Sample applications ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑	ohere Application Server 8.0.0.0 x 8.0.0.0
<u>S</u> how dependencies <u>%</u> - Selected by Installation Manager because	Expand All Collapse All Restore Default se of dependencies
Details	
Stand-alone thin clients resource ad	lanters and embeddable containers

____t. Select port 80 for the Web Server

	IBM Installation Manager
Install Packages	
Fill in the configurations for the p	ackages.
Install Licenses L	ocation Features Summary
✓	Configuration for IBM HTTP Server for WebSphere Application Server 8.0.0.0 Web Server Configuration
	Specify a port number for IBM HTTP Server to communicate. The default por the default port is already in use, then change to another port that is availat Running IBM HTTP Server without root or Administrative privileges might rest ports below 1024. HTTP port: 80
(<))	< < Back Next > Install Cancel

____u. Review the install package list, which shows both WAS and the ifix and click Install

IBM Installation Manager		
Install Packages		
Review the summary information.		T
Install Licenses Location Features Summ	mary	
Target		
Shared Resources Directory: /opt/IBM/IMShared		
Packages		
Packages	Installation Directory	
Web Server Plug-ins for IBM WebSphere Application Server V8.0	/opt/IBM/WebSphere/Plugins	
Web Server Plug-ins for IBM WebSphere Application Server 8.	٥	
▽ [₽] t _a IBM HTTP Server V8.0	/opt/IBM/HTTPServer	
IBM HTTP Server for WebSphere Application Server 8.0.0.0		
$ abla^{-\frac{p}{2}}$ BM WebSphere Application Server Network Deployment V8.0	/opt/IBM/WebSphere/AppServer	
▽)	
8.0.0.0-WS-WASND-IFPM44786 8.0.0.20110804_1105		
$ abla ~ {}^{\mathbb{F}}_{\mathfrak{V}_{a}}$ WebSphere Customization Toolbox V8.0	/opt/IBM/WebSphere/Toolbox	
♥ III WebSphere Customization Toolbox 8.0.0.0		
🚯 Web Server Plug-ins Configuration Tool		
🚯 Profile Management Tool (z/OS only)		
🚯 z/OS Migration Management Tool		
< <u>B</u> ack	Next > Install	Cance

____v. Once the install has completed you should see the dialog below. Select "None" for the "Which Program do you want to strart?" Option (Do Not Start the Profile Management Tool) and Click Finish

The packages are	installed. <u>View Log File</u>
The following packages were installed:	Which program do you want to start?
 Content of the Server V8.0 IBM HTTP Server for WebSphere Applica IBM WebSphere Application Server Network IBM WebSphere Application Server Network IBM WebSphere Application Server Network WebSphere Application Server Network WebServer Plug-ins for IBM WebSphere Ap WebSphere Customization Toolbox V8.0 WebSphere Customization Toolbox 8.0. 	 WebSphere Customization Toolbox Profile Management Tool to create a profile. Profile Management Tool to create an applica None
Note: If the packages support rollback, the tempora	ary directory contains rollback files for installed
packages. You can delete the files on the Files for r	ollback preference page.

____w. Exit the Installation Manager using File -> Exit

۵	IBM Installation Manager
<u>F</u> ile <u>H</u> elp	
Open •	
📒 <u>V</u> iew Log	nager
📃 Installation History	
📃 View Installed <u>P</u> ackages	
Preferences	Install

Note: You installed WAS, HIS, and an ifix, demonstrating a "one pass install".

- 5. Create an application server profile
- ____a. In a terminal window change directories to /opt/IBM/WebSphere/AppServer/bin/ProfileManagement using the command

cd /opt/IBM/WebSphere/AppServer/bin/ProfileManagement as shown below



_ b. Launch the WebSphere Customization Toolkit (formerly the Profile Management Tool) using the command **./pmt.sh**

1100	12/2	- 4640 - ¹¹⁰	JEKA					- in	1	11 - Sheller C	ി	
	ro	ot@th	ink:/opt/l	вм/w	ebSph	ere//	AppSer	ver/bin/	Pro	fileManagem	ent	
<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>T</u> erminal	Ta <u>b</u> s	<u>H</u> elp							
[root	t@thi	nk Pro	fileMana	gement	:]# ./	pmt.	sh					

- 6. Create a WebSphere Application Server Profile, installing the adminconsole and sample application, configuring administrative security with the user "wasadmin" and password "wasadmin".
 - ____a. Select "Create" to start the profile creation process

1	🤜 Applications	Places System		
1	₽	WebSphere Cu	istomization Toolbox 8.0	
	<u>File W</u> indow <u>H</u>	elp		
	🗈 🔞 Profile M	anagement Tool 🕀 Welco	me	
	🚯 Profiles			
	Profile name	Environment	Profile path	Create
				Augment

Note: Even though you launched the Profile Management Tool with the command ./pmt.sh, you'll notice that the WebSphere Customization Toollbox launched. A subset of this new toolbox is installed with WAS which includes the Profile Management Tool and the Configuration Migration Tool.

Profile Management Tool 🕀 Welcome			
Helcome 🛛 🗧	- 8		
Welcome to the WebSphere Customization Toolbox			
Select a tool in the following list to display the welcome information for that tool. To launch a tool, select a tool in the list, and click <i>Launch Selected Tool</i> . Alternatively, select <i>Window > Open Perspective</i> and select a tool in the list.			
List of provided tools:			
Profile Management Tool			
Configuration Migration Tool			

____b. Highlight "Application Server" and click "Next" as shown below.

vironment Selection	
lect a specific type of environment to create. vironments:	
WebSphere Application Server	
Cell (deployment manager and a federated application server)	
Management	
Application server	
Custom profile	

___ c. Select "Advanced Profile Creation"

Profile Creation Options

Choose the profile creation process that meets your needs. Pick the Typical option to allow the Profile Management Tool assign a set of default configuration values to the profile. Pick the Advanced option to specify your own configuration values for the profile.

○ <u>Typical profile creation</u>

Create an application server profile that uses default configuration settings. The Profile Management Tool assigns unique names to the profile, node, and host. The tool also assigns unique port values. The administrative console and the default application will be installed. You can optionally select whether to enable administrative security. Th tool might create a system service to run the application server depending on the operating system of your mach and the privileges assigned to your user account.

Note: Default personal certificates expire in one year. Select Advanced profile creation to create a personal certificate with a different expiration.

Advanced profile creation

Create application server using default configuration settings or specify your own values for settings such as the location of the profile and names of the profile, node, and host. You can assign your own port values. You can optionally choose whether to deploy the administrative console and Sample applications, and create a Web serve definition. You might have the option to run the application server as a system service depending on the operating

____ d. Continue through the panels accepting all the defaults by clicking on "Next" until you reach the "Administrative Security" panel, then specify "wasadmin" for the user and "wasadmin" for the password.

Administrative Security
U
Choose whether to enable administrative security. To enable security, supply a user name and password for logging into administrative tools. This administrative user is created in a repository within the application server. After profile creation finishes, you can add more users, groups, or external repositories.
Enable administrative security
User name:
wasadmin
Password:
••••••
Confirm password:
••••••

_ e. Again continue though all the panels accepting all the defaults by clicking "Next" until you reach the panel shown below. Create the profile by clicking "Create"



____f. Unselect the "First Steps" dialog, click "Finish"

	Profile Management Tool 8.0		
,	Profile Creation Complete		
2r	The Profile Management Tool created the profile successfully.		
-	The next step is to decide whether to federate the application server into a deployment manager cell.		
	To federate the application server, use either the addNode command or the administrative console of the deployment manager. Using the administrative console requires the application server to be running.		
	You can start and stop the application server from the command line or the First steps console. The First steps console also has links to an installation verification test and other information and features that relate to the application server.		
	Launch the First steps console.		
	To start the Profile Management Tool later, use the PMT command in the <i>app_server_root/</i> bin/ProfileManagement directory or the option in the First steps console.		
	\frown		
	< Back Next > Cancel Finish		

____g. Exit the WCT (WebSphere Customization Toolbox) by clicking File ->Exit

	applications indees system		
•	WebSphere Customization Toolbox 8.0		
<u>F</u> ile	<u>W</u> indow <u>H</u> elp		
Exit	xit Oprofile Management Tool 🕀 Welcome		
🕐 P	rofiles		
Pro	ofile name Environment Profile path	Create	

- 7. Launch WebSphere Customization Toolbox (WCT) to Configure the HTTP Server Plugin
 - ___ a. As shown below change directories to /opt/IBM/WebSphere/Toolbox/WCT/ then enter ./wct.sh



b. Specify Web Server Plug-ins Configuration Tool and Click Launch Selected Tool



___ c. Click the Add button

🕀 WebSpl	here Customization Toolbox 8.0	
<u>F</u> ile <u>W</u> indow <u>H</u> elp		
🖹 🔕 Web Server Plug-ins Config	guration Tool 🚯 Welcome	
💿 Web Server Plug-in Runtime Loc	ations	- 8
Name	Location	A <u>d</u> d
		<u>R</u> emove
		R <u>o</u> admap

____d. Enter **webserver1** and **/opt/IBM/WebSphere/Plugins** as shown below, and click **Finish**

Ĩ	e	Web Server Plug-ins Configuration Tool 8.0	×
	Add Web	Server Plug-in Location	
	Add a prev	viously installed Web server plug-in location to your working set.	
	Web serve	r plug-in location	
	<u>N</u> ame:	webserverl	
	Location:	/opt/IBM/WebSphere/Plugins	B <u>r</u> owse
þ			
E E E			
		Cancel	Finish

___e. Click Create



____f. Select IBM HTTP Server V8 and click Next

g. Enter /opt/IBM/HTTPServer/conf/httpd.conf and click Next h. Create an userid ihsadmin, with a password of ihsadmin, as shown and click Next

Web Server Plug-ins Co	nfiguration Tool 8.0	
Setup IBM HTTP Server Administration Server		
Optionally configure an administrative server to administer the WebSphere Application Server administrative console by usin communication between them.	e Web server. You can manage the Web server from a g the IBM HTTP Server administrative server to control the	
☑ Setup IBM HTTP Server Administration Server		
Specify a port number for IBM HTTP Server administation server to communicate. The default port is 8008. If the default port is already in use, then change to another port that is available. Running IBM HTTP Server administation server without root or Administrative privileges might restrict use of ports below 1024. <u>H</u> TTP Administration Port: 8008 Optionally create a user ID and password to authenticate to the IBM HTTP Server Administation Server from the WebSphere Application Server administrative console. The user ID and password is encrypted and stored in the co		
☑ <u>C</u> reate a user ID for IBM HTTP Server Administration Ser	ver authentication	
User ID: ihsadi	nin	
Password:	•••	
Confirm password:		

____i. Enter ihsrun and ihsgrp as shown and select "Create a new system user ID......", as shown below then click Next

Setup IBM HTTP Serv	Web Server Plug-ins Configuration Tool 8.0
Specify a system user ID Administration Server an then choose to create a	and group. The user ID is granted write access to IBM HTTP Server, IBM HTTP Serve I web server plug-in configuration files. If the user ID or group does not exist on the new system user and group with the credentials.
<u>U</u> ser ID:	ihsrun
<u>G</u> roup:	ihsgrp
Create a new unique	system user ID and group using the credentials.

____j. Specify webserver1 for the web server name and click Next

Heb Server Plug-ins Configuration Tool 8.0	×		
Web Server Definition Name	ĝ		
Use a Web server definition to manage a Web server through the WebSphere Application Server administrative con or the wsadmin tool. The definition name must be unique because this name is used to identify this Web server in t administrative console.	sole he		
<u>S</u> pecify a unique Web server definition name:			
webserverl			
The Web server definition name must not be empty and it must not contain the following special characters or space /*,:; = +? <> & % ' " [] > # \$ $^{ }$ { } Note: a period(.) is not valid if it is the first character.	ce:		

____k. Check local and enter /opt/IBM/WebSphere/AppServer then click Next

Web Server Plu	g-ins Configuration Tool 8.0
Configuration Scenario Selection	<u>الا</u>
Configure the Web server plug-ins to the computer w server are not on the same computer, choose the re application server are on the same computer, choos server definition you create in this wizard is defined	vhere the Web server exists. When the Web server and application mote configuration scenario. When both Web server and se the local configuration scenario. In the local scenario, the Web automatically in the application server.
Configuration scenario	
(<u>Remote</u>) Host name or IP address of the application	ation server
 (Local) Installation location of WebSphere Applic 	ation Server
/opt/IBM/WebSphere/AppServer	
	Browse
For the remote configuration scenario, the host name address formats: Fully qualified domain name system (DNS) host nam The default short DNS host name Numeric IP address	e must be accessible on the network through one of the following e

___ I. Select the AppSrv01 profile and click Next

Select the WebSphere Application Server profile to configure with the current Web server plug-in and create the Server definition.

vailable Profiles:

AppSrv01

___ m. Click Configure

___ n. Click Finish

• Web Server Plug-ins Configuration Tool 8.0	×
Plug-in Configuration Result	
Success: The configuration has been completed successfully.	*
The stand-alone application server is configured with a Web server definition. You may start up your Web sev application server to test your configuration.	er and
Web server type configured:	=
IBM HTTP Server V8	
Web server definition: webserver1 Plug-in configuration file: /opt/IBM/WebSphere/Plugins/config/webserver1/plugin-cfg.xml	·
	• •
< <u>Back</u> Configure > Cancel	<u>F</u> inish

- ____ o. Exit the WCT when plugin configuration is complete
- 8. Configure WebSphere Application Server to use DB2.
 - _____a. DB2 is not running as a service, so you will need to start DB2 by opening a terminal window and entering "su – db2inst1" which will change you from the user root to db2inst1 then enter the command db2start as and wait for the message "SQL1063N DB2START processing was successful" as shown below.



- b. Open a terminal window and change to the directory opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin
- ____ c. Start the server with the command "./startServer server1" as shown below



____ d. Wait until you see the message

ADMU3000I: Server server1 open for e-business; process id is xxx

__ e. Open a browser on your host machine and enter the URL <u>http://localhost:9060/ibm/console/</u>

Note: If you receive a warning about the SSL certificate being presented click "Continue to the website "to accept the certificate. This occurs because you are using a self-signed certificate from WAS for which a certificate does not already exist in the browser

The warning below is from Internet Explorer.

$\mathbf{\mathbf{\hat{s}}}$	There is a problem with this website's security certificate.
	The security certificate presented by this website was not issued by a trusted certificate authority.
	The security certificate presented by this website was issued for a different website's address.
	Security certificate problems may indicate an attempt to fool you or intercept any data you send to the server.
	We recommend that you close this webpage and do not continue to this website.
	Sclick here to close this webpage
C	S Continue to this website (not recommended).
	More information

The warning from Firefox is shown below

This Connection is Untrusted
You have asked Firefox to connect securely to 10.10.10.101:9043 , but we can't confirm that your connection is secure.
Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.
What Should I Do?
If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.
Get me out of here!
Technical Details
I Understand the Risks
If you understand what's going on, you can tell Firefox to start trusting this site's identification. Even if you trust the site, this error could mean that someone is tampering with your connection.
Don't add an exception unless you know there's a good reason why this site doesn't use trusted identification.

____f. Since WAS administrative security is enabled this will redirect to <u>https://localhost:9043/ibm/console/login.do?action=secure</u> Enter **wasadmin** for user ID and **wasadmin** for the password

WebSphere. software	
	WebSphere Integrated Solutions Console User ID: wasadmin Password: Log in
Licensed Materia Rights Reserved registered trade many jurisdictio trademarks of I available on the	als - Property of IBM (c) Copyright IBM Corp. 1997, 2011 All d. IBM, the IBM logo, ibm.com and WebSphere are trademarks or marks of International Business Machines Corp., registered in ns worldwide. Other product and service names might be BM or other companies. A current list of IBM trademarks is a Web at <u>Copyright and trademark information</u> .

Note: When you open the browser you will receive one or two security alerts.

If prompted to remember passwords, DISABLE this function as shown below.

Do you want Windows to remember this password, so that you don't have to type it again the next time you visit this page?		
Don't offer to remember any more passwords		
Yes No		

Password remembering functions can compromise security, so this function should not be used.

___ g. Once inside the console Navigate to **Resources -> JDBC Providers** ,Change the scope to **Node=thinkNode01** then select **New**

Welcome	JDBC providers		?	
Guided Activities				
Servers	JDBC providers			
Applications	Use this page to edit properties of a JDBC provider. The JDBC provider object encapsulates the specific JDBC driver implementation class for access to the specific vendor database of your environment. Learn more about this task in a public structure and database of the specific vendor database of your environment. Learn more about this task in a			
Services	guided activity. A guided activity provides a list of task steps and more general information about the topic.			
Resources				
Schedulers	Scope specifies the level at which the resource definition's visible. For detailed			
Object pool managers	information on what scope is and now it works, see the scope settings here.			
MS	Node=thinkNode01			
JDBC				
 JDBC providers 	Preferences			
Data sources	New., Deleta			
 Data sources (WebSphere Application Server V4) 				
Resource Adapters				
Asynchronous beans	Select Name 🛟	Scope 🗘	Description 💲	
Cache instances	None			
) Mail	Total 0			
URL	- Total o			
Resource Environment				
Security				

____h. Click on JDBC Providers to start the dialog to create a DB2 JDBC Provider with the settings shown below (note the resource scope of "thinkNode01"). Then click Next

Create a new JDBC Provider			
→	Step 1: Create new JDBC provider	Create new JDBC provider	
Set the Step 2: Enter vendor 2 database class path The wize information		Set the basic configuration values of a JDBC provider, which encapsulates the specific vendor JDBC driver implementation classes that are required to access the database. The wizard fills in the name and the description fields, but you can type different values.	
	Step 3: Summary	Scope cells:thinkNode01Cell:nodes:thinkNode01	
		* Database type DB2	
		* Provider type DB2 Universal JDBC Driver Provider 💟	
		* Implementation type XA data source	
		* Name DB2 Universal JDBC Driver Provider (XA)	
		Description	
		Two-phase commit DB2 JCC provider that supports JDBC 3.0. Data sources that use this provider support the use of XA to perform 2- phase commit processing. Use of driver type 2 on the application server for z/OS is not supported for data sources created under this provider.	

____i. Configure the classpath to **/opt/ibm/db2/V9.7/java** and a native library path to **/opt/ibm/db2/V9.7/bin**



- ____j. Click Next, Review the Summary Panel Then click Finish.
- __ k. **Save** your changes.
- ___ I. Click on the DB2 Universal JDBC Driver Provider (XA).

New	Delete		
Select	Name 🛟	Scope 🗘	Description 🗘
You can administer the following resources:			
	DB2 Universal JDBC Driver Provider (24)	Node=thinkNode01	Two-phase commit DB2 JCC provider that supports JDBC 3.0. Data sources that use this provider support the use of XA to perform 2-phase commit processing. Use of
___ m. Click on Data sources

<u>JDBC providers</u> > DB2 Universal JDBC Driver Provider (XA)

Use this page to edit properties of a Java Database Connectivity (JDBC) provider. The JDBC provider object encapsulates the specific JDBC driver implementation class for access to the specific vendor database of your environment.

onfiguration	
General Properties	Additional Properties
* Scope cells:thinkCell01:nodes:thinkNode01	Datasources
* Name	 <u>Data Sources</u> <u>(WebSphere</u>)

___ n. Click New

- ____ o. Configure a Data source with following settings
 - 1) DataSource Name WAS V8 Datasource for DB2
 - 2) JNDI Name jdbc/WAS97DB_DS
 - 3) Database Name WAS97DB
 - 4) Server name think
 - 5) Port **50000**
 - 6) the settings shown below, and Save

Step 1: Enter basic	Summary	
information	Summary of actions:	
Step 2: Enter	Options	Values
properties for the	Scope	cells:thinkNode01Cell:nodes:thinkNode01
data source	Data source name	WAS V8 Datasource for DB2
Step 3: Setup	JNDI name	jdbc/WAS97DB_DS
security aliases	Select an existing JDBC provider	DB2 Universal JDBC Driver Provider (XA)
Step 4: Summary	Implementation class name	com.ibm.db2.jcc.DB2XADataSource
	Driver type	4
	Database name	WAS97DB
	Server name	think
	Port number	50000
	Use this data source in container managed persistence (CMP)	true
	Authentication alias for XA recovery	(none)
	Component-managed authentication alias	(none)
	Mapping-configuration alias	(none)
	Container-managed authentication alias	(none)

____ p. After configuring the Data source you will need to create a JAAS–J2C Authentication Alias. Select the data source you just configured, then click the link JAAS-J2C authentication data as shown below.

Configuration Test connection	
General Properties * Scope cells:thinkNode01Cell:nodes:thinkNode01 * Provider DB2 Universal JDBC Driver Provider (XA)	Additional Properties Connection pool properties WebSphere Application Server data source properties Custom properties
Name WAS V8 Datasource for DB2 JNDI name jdbc/WAS97DB_DS Use this data source in container managed persistence (CMP)	Related Items
Description DB2 Universal Driver <u>Datasource</u>	

____ q. Select **New** and create an alias with the name **db2alias**, the user ID of **db2inst1** and password of **password**. **Cl**ick **OK**. Then **Save** the changes.

Specifies a list of user i	dentities and	passwords	tor Java(1
General Properties			
* Alias			
db2alias			
* User ID			
db2inst1			
* Password			
•••••			
Description			
Apply OK Reset Ca	incel		

_____r. Navigate to the data source, and change the security settings to use a containermanaged authentication alias, using the alias you just created. Select **db2alias** from the drop-down list

Select the authentication values for this resource. Authentication alias for XA recovery (none) Component-managed authentication alias (none)	
Select the authentication values for this resource. Authentication alias for XA recovery (none) Component-managed authentication alias (none) V	
Authentication alias for XA recovery (none) Component-managed authentication alias (none)	
(none)	
Component-managed authentication alias (none)	
Mapping-configuration alias	
Container-managed authentication allas IthinkNode01/db2alias	
Select th	he authentication values for this resource.
Common and required data source properties	
Name Value	
* Driver type 4	
* Database name WASV97DB	
* Server name think	
* Port number 50000	

____s. Select OK. Save your configuration by clicking Save



- 9. Change the data source mapping for the Default Application
- ____a. Navigate to Applications -> Application Types -> WebSphere Enterprise Applications
- ____ b. Stop the **Default Application**

Start Stop Install Update Rollout Update Remove File Export Export DDL Export File				
Select	Name 🗘	Application Status 🖄		
Youca	n administer the following resources:			
	DefaultApplication	\$		
	ivtApp	\$		
	query	\$		
Total 3				

___ c. Click on the application **DefaultApplication** to drill down into the application settings

Enterprise Applications

Use this page to manage installed applications. A single application can be deployed onto multiple servers.

Ŧ	Preferences
---	-------------

Start	Stop Install Uninstall Update Rollout Update	Remove File Export DDL Export File			
D					
Select	Name 🛟	Application Status ሷ			
You c	an administer the following resources:				
	DefaultApplication	8			
	ivtApp	\$			
	query	\$			
Total 3					

____ d. Click on "Map data sources for all 2.x CMP beans"

erprise Applications > DefaultApplication a this page to configure an enterprise appl	ication. Click the links to access pages for furthe
nfiguring of the application or its modules.	
General Properties	Modules
* Name DefaultApplication	Manage Modules
Application reference validation	Web Module Properties
Issue warnings 💽	Session management
Detail Properties	Context Root For Web Modules
Target specific application	JSP and JSF options
status	Virtual hosts
Startup behavior	Enterprise Java Bean Properties
Application binaries	= Default magazine provider
Class loading and update detection	references
 Request dispatcher properties 	Application profiles
 Security role to user/group mapping 	Map data sources for all 2.x CMP beans
 View Deployment Descriptor 	 <u>Provide default data source</u> mapping for modules containing 2.×
 Last participant support extension 	entity beans EIB INDI names
	- <u>coponernames</u>

- ____e. Change the Data Source settings as described below
 - 1) Browse to jdbc/WAS97DB_DS as the target resource JNDI name, and select Apply
 - 2) Select the Increment EJB and click **Set Authorization Type**, specify **Container** for the Authorization Type
 - 3) Click **OK**

Enterprise Applications > DefaultApplication > Map data sources for all 2.x CMP beans Map data sources for all 2.x CMP beans Specify an optional data source for each 2.x container-managed persistence (CMP) bean. Mapping a specific data source to a CMP					
	Set Multiple	JNDI Names 🔹	Set Authorization Type *	Modify Resource Authenticatio	n Method
Select	EJB	EJB module	URI	Target Resource JNDI Name	Resource authorization
	Increment	Increment EJB module	Increment.jar,META-INF/ejb- jar.×ml	jdbc/WASV7DB_DS Browse	Resource authorization: Per application
OK Cancel					

- 4) Select the Increment EJB and click Modify Resource Authentication Method
- 5) Select **Use default method** and browse to **db2alias** as the Authentication data entry
- 6) Click Apply

Set Multiple	2 JNDI Names 🔻	Set Authorization Type 🔻	Modify Resource Authenticatio	m Method
			 Specify authentication method: None Use default method (many-to-Authentication data entry Close trusted connections (one-to-Authentication data entry Select Use custom login configuration Select Apply 6 	one mapping)
Select EJB	EJB module	URI	Target Resource JNDI Name	Resource authorization
4 Increment	Increment EJB module	Increment.jar,META-INF/ejb- jar.xml	jdbc/WASV7DB_DS Browse	Resource authorization: Container Authentication method: None

$__$ f. Verify the settings indicated below and click OK

the default data source for the module that contains the enterprise bean.						
	Set Multiple JNDI Names * Set Authorization Type * Modify Resource Authentication Method				thentication Method	
D	6					
Select	Bean	Module	URI	Target Resource JNDI Name	Resource authorization	
	Increment	Increment EJB module	Increment.jar, META-INF/ejb- jar.xml	jdbc/WASV97DB_DS Browse	Resource authorization: Container Authentication method: DefaultPrincipalMapping Authentication data entry: thinkNode01/db2alias	
OK Cancel						

__ g. **Save** your changes. __ h. Start the **DefaultApplication**

Start	Start Stop Install Uninstall Update Rollout Update Remove File Export Export DDL Export File		
Select	Select Name 🗘 Application Status 🕰		
You can administer the following resources:			
	DefaultApplication	÷	
	<u>iviApp</u>	\$	
	query	\$	
Total 3			

____ i. Open Firefox with the url http://localhost:9080/hitcount and select "Enterprise Bean" as the execution method and click on "Increment" as shown below



____j. If you have successfully configured the datasource to use DB2 you'll see the value increment each time you click the **Increment** button (remember to set the "Enterprise Java Bean" radio button).



10.Configure IBM HTTP Server for use with WAS

- ____a. Start both IBM HTTP Server
 - 1) In a command window, cd to /opt/IBM/HTTPServer/bin
 - 2) run ./apachectl start

	root@think:/opt/IBM/HTTPServer/bin	
<u>File Edit V</u> iew	v <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp	
[root@think b: [root@think b: [root@think b:	in]# cd /opt/IBM/HTTPServer/bin in]# ./apachectl start in]#	

____b. Test that IHS is running by entering http:/localhost__You should see the following

Latest Headlines 🚞 IBM		
*		
	WebSphere. software	Ī
	IBM HTTP Server Version 8.0	
	Image: Constraint of the second secon) 🖻 <u>Release</u> support notes

___ c. In the WAS admin console navigate to Server Types -> Web Servers



- ____ d. Note that webserver1 was created using the WebSphere Customization Toolkit earlier. Now that the webserver is created generate and propagate the plugin configuration file as shown below
 - 1) Select the web server (1), and then click Generate Plug-in (2),
 - 2) Select the web server (1), and then click Propagate Plug-in (3).

Veb servers			
Web servers Use this page to view a list of the installed web servers. + Preferences Generate Plug-in Propagate Plug-in New Delete Templates Start Stop Terminate			
Select Name \diamond Web server Type \diamond	Node 🐎 _	Host Name 🗘	
You can administer the following resources:			
IBM HTTP Server	thinkNode01	think.ibm.com	
Total 1			

__ e. Go to Firefox and enter <u>http://localhost/hitcount</u>. Exercise the application as before selecting "Enterprise Java Bean" and clicking Increment



___ f. You may also want to invoke <u>http://localhost/snoop</u> and examine the results. You can see that the HTTP server is being used as well as theWAS server's embedded HTTP server (on port 9080).

- ___ 11.Configure WebSphere Application Server to use an LDAP as a user registry. OpenLDAP has been installed and configured with a small user user population on the lab image.
 - ____a. Navigate to Security in the WAS admin console, and click Global Security.

Integ	rated Solutions Console	Welcome was
Viev	w: All tasks	•
= We	elcome	
🗄 Gu	uided Activities	
🗄 Se	rvers	
🗄 Ap	plications	
⊞ Se	rvices	
🗄 Re	sources	
🖯 Se	curity	
	Global security Security domands Administrative Authorizatio SSL certificate and key mai Security auditing Bus security	on Groups nagement

____b. On the Global Security dialog, click Configure

Global security Global security Use this panel to configure administration and the default application security policy. This security configuration applies to the security polic functions and is used as a default security policy for user applications. Security domains can be defined to override and customize the secu applications. Security Configuration Wizard Security Configuration Report Administrative security Authentication Enable administrative security Administrative user roles Administrative group roles Authentication mechanisms and expiration ⊙ <u>LTPA</u> ÷. Administrative authentication Kerberos and LTPA Application security (This function is currently disabled. See the IBM Supp possible future updates.) 🔲 Enable application security Kerberos configuration $\ensuremath{\mathbb{C}}$ SWAM (deprecated): No authenticated communication Java 2 security Authentication cache settings \Box Use Java 2 security to restrict application access to local resources \square Warn if applications are granted custom permissions 🔲 Restrict access to resource authentication data ■ RMI/IIOP security User account repository Current realm definition 🔲 Use realm-qualified user names Federated repositories Available realm definitions Security domains Federated repositories Configure... Set as current External authorization providers

___ c. Click Add Base Entry to Realm

Cell=thinkNode01Cell, Profile=AppSrv01

obal security		2	
Global security > Federated repositorie	25		
By federating repositories, identities sto virtual realm. The realm can consist of system, in one or more external reposi external repositories.	ored in multiple repositories of identities in the file-based re tories, or in both the built-in	can be managed in a single, pository that is built into the repository and one or more	
General Properties			
* Realm name defaultWIMFileBasedRealm			
* Primary administrative user name wasadmin			
Server user identity			
ullet Automatically generated server ide	entity		
O Server identity that is stored in the	repository		
Server user ID or administrative user on a Version 6.0.x node			
Password			
✓ Ignore case for authorization			
Repositories in the realm:			
Add Base entry to Realm	Use built-in repository	Remove	
Select Base Entry	Repository Identifier	Repository Type	
You can administer the following res	ources:		

File

o=defaultWIMFileBasedRealm InternalFileRepository

____ d. Click Add Repository, and select LDAP repository form the drop-down list

Global security ? -
<u>Global security</u> > <u>Federated repositories</u> > Repository reference
Specifies a set of identity entries in a repository that are referenced by a base entry into the directory information tree. If multiple repositories are included in the same realm, it might be necessary to define an additional distinguished name that uniquely identifies this set of entries within the realm.
General Properties
Repository Add Repository IDAP repository Distinguished name custom repository at uniquely identifies this set of entries in the realm File repository
Distinguished name of a base entry in this repository
Apply OK Reset Cancel

____e. Enter LDAP for the Repository Identifier, Custom for the Directory Type and think for the Primary Host Name, and **389** for the port. Then, click **Apply**.

Global security > Federated repositories > Repository reference > New	
Specifies the configuration for secure access to a Lightweight Directory Access Protoc	ol (LDAP) repository with optional failover servers.
General Properties	
Repository identifier LDAP Repository adapter class name com.ibm.ws.wim.adapter.ldap.LdapAdapter	
LDAP server	Security Bind distinguished name
Custom	Bind password Login properties Lid An attribute for Kochoros principal parts
Select Failover Host Name Port	
None Add	Certificate mapping EXACT_DN Certificate filter
Support referrals to other LDAP servers ignore - Support for repository change tracking none - Custom properties	Require SSL communications Ornerally managed Manage endpoint security configurations
New Delete Select Name Value	O Use specific SSL alias CellDefaultSSLSettings

____f. Click on **Group attribute definition**, under Additional Properties

Note: Until you click **Apply** the **Group Attribute Definition** is not accessible. If you accidentally click **OK** instead of Apply, you end up on the **Manage Repositories** panel. To return panel shown below simply "drill down" into **LDAP** repository from the **Manage Repositories** panel

Add	Certificate filter
ignore 💌	🗆 Require SSL c
Support for repository change tracking	 Centrally mail
Custom properties	Manage
New Delete	O Use specific
Select Name Value	CellDefault
Additional Properties	
Performance	
LDAP entity types	
Group attribute definition	
Apply OK Reset Cancel	

____g. Enter **guid** for the **Name of the group membership attribute** as shown below and click **OK.** Then, **Save** your changes

General Properties
Scope of group membership attribute
 Direct - Contains only immediate members of the group without members of subgroups Nested - Contains direct members and members nested within subgroups of this group All - Contains all direct, nested, and dynamic members
Apply OK Reset Cancel

____h. Click **Save**, to save you changes



_____i. Enter **o=LDAP** for Distinguished name of the base entry for the realm and **dc=ibm,dc=com** for the Distinguished name of the base entry for this repository. Click **OK**. Then **Save** your changes

Global security > Federated repositories > o=LDAP

Specifies a set of identity entries in a repository that are referenced by a base entry into the directory information tree. If multiple repositories are included in the same realm, it might be necessary to define an additional distinguished name that uniquely identifies this set of entries within the realm.

General Properties
* Repository
 Distinguished name of a base entry that uniquely identifies this set of entries in the realm Co=LDAP
Di stinguished na me of a base entry in this repository dc=ibm,dc=com
Apply OK Reset Cancel

____j. Navigate to Security in the WAS admin console, and click Global Security



- ____k. As shown below on the Global Security Panel
 - 1) Click Set as current,
 - 2) Click Apply
 - 3) Select Enable Application Security
 - 4) Click **Apply**
 - 5) Then Save your changes

Security Configuration Wizard Security Config	juration Report
Administrative security Carter Administrative security Administrative group roles Administrative authentication	Authentication Authentication mechanisms and expiration © LTPA © Kerbergs and LTPA
Application security Tenable application security 3	(This function is currently disabled. See the possible future updates.) <u>Kerberos configuration</u>
Java 2 security Use Java 2 security to restrict application access to local resources Warn if applications are granted custom permissions Restrict access to resource authentication data	O SWAM (deprecated): No authenticated com Authentication cache settings
User account repository Current realm definition Federated repositories	 Java Authentication and Authorization Servic □ Use realm-qualified user names
Available realm definitions 1 Federated repositories Configure Set as current	Security domains External authorization providers Custom properties

- ____ I. In order for the changes to be reflected you will need to stop and start the server.
 1) Logout from the admin console
 - 2) Stop the server from the terminal window you started it in with the command:

./stopServer.sh server1 –username wasadmin –password wasadmin

3) Wait until you see the message

ADMU4000I: Server server1 stop completed.

4) Start the server from the LINUX shell with the command:

./startServer server1

____m. Once the server has started, log back into the WAS admin console. Navigate to Users and Groups and click Manage Users

View:	All tasks	×	
Welcome			
🗄 Guide	d Activities		
± Serve	rs		
🗄 Applic	ations		
± Servic	tes		
Resources			
Security			
Environment			
± System administration			
🖃 Users	and Groups		
Administrative user roles			
Administrative group roles			
Ma	nage Users		
1416	under en onbe		

____n. In the **Seach for Users** dialog click **Search.** You should see the user entries from LDAP as well as for wasadmin user, in the file based registry.

Search for Users Search for #Maximum results User ID Search 100 10 users matched the search criteria.							
Create Delete Select an action							
Select	User ID	First name	Last name	E-mail		Unique I	Name
	idoe1	John Doe1	Doe1		uid=jdoe1,	ou=user,o=Ll	DAP
	idoe2	John Doe2	Doe2		uid=jdoe2,ou=user,o=LDAP		
	idoe3	John Doe3	Doe3		uid=jdoe3,	ou=user,o=Ll	DAP
	<u>idoe4</u>	John Doe4	Doe4		uid=jdoe4,ou=user,o=LDAP		
	idoe5	John Doe5	Doe5		uid=jdoe5,ou=user,o=LDAP		DAP
	jdoe6	John Doe6	Doe6		uid=jdoe6,ou=user,o=LDAP		
	<u>idoe7</u>	John Doe7	Doe7		uid=jdoe7,ou=user,o=LDAP		
	jdoe8	John Doe8	Doe8		uid=jdoe8,ou=user,o=LDAP		
	jdoe9	John Doe9	Doe9		uid=jdoe9,ou=user,o=LDAP		
	wasadmin	wasadmin	wasadmin		uid=wasadmin,o=defaultWIMFileBasedRealm		
Page 1 of 1							

____ o. Open a Konqueror browser (Applications -> Internet -> Konqueror) and enter the URL http://localhost/snoop. You should be prompted for a Username and Password, as shown below. Enter jdoe1 for the Username and jdoe1 for the password

Note: You need to use Konqueror because Firefox is already open for the admin console, and as a result, Firefox has a valid LTPA token (cookie). Thus if you simply open another Firefox instance you will not be prompted to login since the LTPA cookie used to authenticate wasadmin to the admin console, will be present in the browser. So, no authentication prompt will occur

1	Red Hat Enterpr	rise Linux Ve	rsion 5 - Konqueror	
ocation <u>E</u> d	lit <u>V</u> iew <u>G</u> o <u>B</u> ookmarks <u>T</u> ools <u>S</u> etting	gs <u>W</u> indow	<u>H</u> elp	
۵ 🏓 🔈	् 🏤 🖧 😣 🖾 🗟 🍳 🤤 👌	3		
Locatior	n: 🕘 http://localhost/snoop			-
	Red Hat Enterprise Linux Version 5	5		
			Conviriable 0, 2010 Red Hat Inc.	
	l l l l l l l l l l l l l l l l l l l		Authorization Dialog X	
	Get the latest news at	R	You need to supply a username and a password to access this site.	
	Red Hat Network	Site:	Default Realm at localhost	
	Manage your system effectively throug			
	Network.	<u>U</u> sername:		
	Global Support Services	<u>P</u> assword:		
	Need help with Red Hat Enterprise Linu		Keep password	
	Support Services portal features compr options to getting assistance in manage			
	system.		<u>O</u> K <u>C</u> ancel	
	Global Learning Services			
	You've got Red Hat Enterprise Linux, nov	v aet the		
	skills. Check out Red Hat's training cours	es and		
	industry-acclaimed certifications — the r	nost		
	respected certifications in the Linux space	ce.		

Congratulations, your application infrastructure is now ready to serve applications through the

HTTP server -> HTTP server plug-in -> WebSphere Application Server -> DB2.

Before starting the next part of the lab, do the following;

1) Log out of the admin console

2) Stop WebSphere Application Server by entering the following command from the LINUX command

window where you started the application server.

./stopServer.sh server1 –username wasadmin –password wasadmin

Once you see the message;

ADMU4000I: Server server1 stop completed. You're ready to proceed to part 1.6

1.6 Adding Clustering to the Departmental Deployment

- ____1. Create the Deployment Manager profile
 - ____p. Start the graphical Profile Management Tool (PMT) with the command ./pmt.sh from a terminal shell in the directory /opt/IBM/WebSphere/AppServer/bin/ProfileManagement



___ q. Click Create

___ r. Highlight Management as the Environment Selection as shown below, then click Next

•	Profile Management Tool 8.0			
En	Environment Selection			
	ý	1		
Se	elect a specific type of environment to create.			
<u>E</u> r	nvironments:			
V	7 WebSphere Application Server			
	Cell (deployment manager and a federated application server)			
	Management			
	Application server			
	Custom profile			
	Secure proxy (configuration-only)			

____s. Select Deployment Manager, then click Next



- _____t. As you did in part 1, select **Advanced Profile Creation** on the next panel, then click **Next**
- _____u. Accept the defaults, clicking **Next**, until you get to the Administrative Security Panel. Then enter "**wasadmin**" for the user ID and "**wasadmin**" for the password.

Administrative Security	
Choose whether to enable administrative security. To enable security, supply a user name and password for logging into administrative tools. This administrative created in a repository within the application server. After profile creation finishes, you can add more users, groups, or external repositories.	user is
Enable administrative security User name:	
wasadmin	
Password:	
•••••	
Confirm password:	
•••••	

v. Continue to accept the PMT provide defaults until you reach the Port Value Assignment. Select **Default Port Values** as shown below (we'll take steps to insure no conflicts exist)

Profile Managem	ent Tool 8.0				
Port Values Assignment					
Activity was detected on these ports: 9060, 9043, 9401, 9403, 9	402, 9100				
The values in the following fields define the ports for the deployment manager and do not conflict with other profiles i installation. Another installation of WebSphere Application Server or other programs might use the same ports. To avo time port conflicts, verify that each port value is unique.					
Default Port Values					
<u>A</u> dministrative console port (Default 9060):	9060				
Administrative <u>c</u> onsole secure port (Default 9043):	9043				
Bootstrap port (Default 9809):	€ 088				
<u>S</u> OAP connector port (Default 8879):	8879				
Administrative interprocess communication port (Default 9632)(X): 9632				
SAS SS <u>L</u> ServerAuth port (Default 9401):	9401 =				
CSIV2 ServerAuth listener port (Default 9403):	9403				
CSI <u>V</u> 2 MultiAuth listener port (Default 9402):	9402				
<u>O</u> RB listener port (Default 9100):	9100				
Cell discovery port (Default 7277)(<u>6</u>):	7277				
High availability manager communication (DCS) port (Default 935	2): 9352				
DataPower appliance manager secure inbound port (Default 5555): [5555] .				

- ____w. As before in Part 1 when configuring the application server do NOT select "Run the deployment manager process as a Linux service", and click Next
- _____x. Click Create to create the profile,
- ____y. Unselect "First Steps" then click Finish .
- ____ z. Exit the PMT as you did in part 1 by selecting File -> Exit in the upper left corner of the PMT

____ 12.Start the Deployment Manager

____a. Open a LINUX command shell and navigate to /opt/IBM/WebSphere/AppServer/profiles/Dmgr01/bin

____b. Enter the command ./startManager.sh and wait until you see the message;

ADMU3000I: Server dmgr open for e-business; process id is xxxx

- _____13.Federate the Application Server
 - ____ a. Return to the LINUX command shell that you used to start and stop the Application Server (if you closed the shell the directory is
 - /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin)
 - ___ b. Enter the command

./addNode localhost –includeapps –username wasadmin –password wasadmin

This tells WAS to add a node by connecting to the deployment manager running on the localhost, to include the existing applications that are deployed on the application server and to use wasadmin as the administrative userid and password.

__ c. Wait for the message ADMU0003I: Node thinkNode01 has been successfully federated

____ 14.Configure a WAS-ND Cluster

- ____ a. Log into the admin console using Internet Explorer, with the URL http://localhost:9060/ibm/console/ Since WAS administrative security is enabled this will redirect to https://localhost:9043/ibm/console/login.do?action=secure Enter "wasadmin" for user ID and password as you did before.
- __ b. Navigate to Servers -> Clusters and click WebSphere Application Server clusters in the console as shown below.



____ c. Click **New** to create a new cluster

____d. Enter MyCluster for a Cluster name as shown below, then click Next

Cr	Create a new cluster ? -					
	Cre	ate a new cluster				
	→	Step 1: Enter basic	Enter basic cluster information			
		Step 2: Create first cluster member	* Cluster name MyCluster			
		Step 3: Create additional cluster members	Prefer local. Specifies whether enterprise bean requests will be routed to the node on which the client resides when possible.			
		Step 4: Summary	□ Configure HTTP session memory-to-memory replication			
	N	ext Cancel				

____e. In order to use our existing server configuration and application we are going to select create the cluster member by converting an existing application server. Then click Next

reate a new cluster	? .
Create a new cluster	
Step 1: Enter basic cluster information	Create first cluster member
→ Step 2: Create first cluster member	The first cluster member determines the server settings for the cluster members. A server configuration template is created from the first member and stored as part of the cluster data. Additional cluster members are copied from this template.
Step 3: Create additional cluster members	* Member name server1
Step 4: Summary	Select node thinkNode01(ND 8.0.0.0)
	* Weight 2 (020)
	Generate unique HTTP ports
	Select how the server resources are promoted in the cluster. Cluster 💌
	Select basis for first cluster member:
	Create the member using an application server template.
	Create the member using an existing application server as a template. thinkCell01/thinkNode01(ND 8.0.0.0)/server1
	Create the member by converting an existing application server. thinkCell01/thinkNode01(ND 8.0.0.0)/server1
	None. Create an empty cluster.
Previous Next Cance	

____ f. Enter server2 as the server name for the next cluster member. Click Add Member. Then, enter server3 as a server name and click Add Member. At this point, you should have 3 servers in the cluster; server1, server2 and server3. Once you do, click Next

Create a new duster Step 1: Enter basic duster information Step 2: Create first cluster member Step 3: Create member Base 3: Create member Step 3: Create member Step 4: Summary Verify and the second se	Create a new cluster					1
Step 1: Enter basic Create additional cluster members Step 2: Create first Enter information about this new cluster member, and click Add Member to add this cluster member → Step 3: Create additional cluster member, and stored as part of the cluster data. Additional cluster members are copied from this template. * Member name Select node thinkNodeO1(ND 8.0.0.0) ▼ * Weight 2 (020) ✓ Generate unique HTTP ports Add Member						
Step 1: Enter Dasic Create additional cluster members Cluster information Step 2: Create first cluster member There information about this new cluster member, and click Add Member to add this cluster member to the member list. A server configuration template is created from the first member, and stored list, a server configuration template is created from the first member, and stored list, a server configuration template is created from the first member, and stored list, a server configuration template is created from the first member, and stored list, a server configuration template is created from the first member, and stored list, a server configuration template is created from the first member, and stored list, a server configuration template is created from the first member, and stored list, a server configuration template is created from the first member, and stored list, a server configuration template is created from the first function to modify the properties of a cluster member in this list. Use the Delete function to remove a cluster member from this list. You are not allowed to edit or remove the first cluster member. Edit Delete i Delete i Delete	Create a new cluster					
Select Member name Nodes Version Weight server1 thinkNode01 ND 8.0.0.0 2 Total 1	Step 1: Enter basic cluster information Step 2: Create first cluster member Step 3: Create additional cluster members Step 4: Summary	Create add Enter inf cluster in the first are copio * Memb Select thinkd * Weigh 2 ✓ Ge Add Use the Delete fi or remov Edit Select	litional cluster members ormation about this new nember to the member li member, and stored as ad from this template. er name 2 node 1 2 code01(ND 8.0.0.0) ♥ it ((enerate unique HTTP port Member Edit function to modify th unction to remove a clust ve the first cluster memb Delete Member name server1 1	cluster member, and ist. A server configura part of the cluster dat 020) is ne properties of a clus er member from this er. Nodes thinkNode01	click Add Member t tion template is cre a. Additional cluste ter member in this list. You are not al Version ND 8.0.0.0	list. Use the lowed to edit Weight

- ____g. Review the settings, then click **Finish** to create the cluster members
- ___h. Now navigate to Servers -> Server Types _> WebSphere Application Servers, select server1 and click delete

Note: Server1 is being deleted to remove the port conflicts were mentioned previously during profile creation. Alternatively one could have changed the port number settings for server1, but simply removing the server from our configuration is the quickest means remove the conflicts.

_____i. You can choose to save your changes at this time if you wish. But we have one more configuration change to make. Navigate to **Environment -> Virtual Hosts**

ΞEr	vironment				
	Virtual hosts				
	Update global Web server plug-in configuration				
	WebSphere variables				
	Shared libraries				
	Replication domains				
	URI Groups				
+	⊞ Naming				

___j. Click default_host



____ k. Check to make sure that port numbers 9081 and 9444 (for server 2), and port numbers 9082 and 9445 (for server3), are defined. Add them if needed (they should already be listed).

-tual Hosts 🛛 🔞 🥇					
<u>Virtual</u>	<u>Hosts</u> > <u>default_host</u> > Host Aliases				
Use thi virtual	s page to edit, create, or delete a domai host is known.	in name system (DNS) alias by which the			
🕀 Pref	erences				
New	Delete				
D	ð # \$				
Select	Host Name 🗘	Port 🛟			
You c	an administer the following resources:				
	*	443			
	*	5060			
	*	5061			
	*	80			
	*	9080			
	*	9081			
	*	9082			
	*	9443			
	*	9444			
	*	9445			
Total 10					

___ I. **Save** your changes if you've not already done so

____m. Just to make sure all our changes have been pushed out to the node agent, we're going to save and synchronize as shown below.

View: All tasks	Cell=thinkCell01, Profile=Dmgr01
Welcome	Save ? - I
🗄 Guided Activities	Save
🗄 Servers	Save your workspace changes to the master configuration.
	Click Save to update the master repository with your changes. Click Discard to discard
	your changes and begin work again using the master repository configuration. Click Cancel to continue working with your changes.
⊞ Resources	R Total changed documents: 0
⊞ Security	
🗄 Environment	Synchronize changes with Nodes
🗆 System administration	
 Cell Save changes to master repository Deployment manager 	Save Discard Cancel

- ___ n. Once the synchronization is complete, you will need to regenerate and propagate the HTTP server plug-in. Navigate to Servers -> Web Servers, selecting webserver1 and clicking Generate Plug-in.
- _____o. You can now start your application server cluster by navigating to ; Servers -> Clusters -> WebSphere Application Server Clusters , selecting MyCluster and clicking start. Once the cluster can now start your application server cluster by navigating toServers -> Clusters -> WebSphere Application Server Clusters. Select MyCluster and click Start. Once the cluster is started, you can enter http://localhost/snoop in a Firefox browser instance, and if you examine it's output, you'll see that some requests are served from port 9081 (server2) and some from port 9082 (server3).

VebSphere application server clusters ? =
WebSphere application server clusters
Use this page to change the configuration settings for a cluster. A server cluster consists of a group of application servers. If one of the member servers fails, requests will be routed to other members of the cluster. Learn more about this task in a <u>guided activity</u> . A guided activity provides a list of task steps and more general information about the topic.
New Delete Start Stop Ripplestart ImmediateStop
Select Name 🗘 Status ሷ
You can administer the following resources:
□ MyCluster ↔
Total 1

Note: You may have noticed that you were not prompted to login when you accessed the application, this is because the Global Security settings a standalone WAS instance is not migrated during federation into a WAS-ND cell. While we could repeat step 6 from part 1 (above) we're not going to do so. A later lab will introduce WAS multiple security realm support and we'll use that feature for configuring application security.

15.Take a VM snapshot (to insure you have a recovery point). Provide a meaningful name such as " Lab 1 End"



Lab 2 Administering an OSGi Application

2.1 Before you begin

This exercise guides you through the administration of a modular application using a strategic technologies: OSGi, the modular system for Java.

You will use the IBM® WebSphere® Application Server (WAS) version 8.0 cluster you configured in Lab 1.

Upon completing this exercise you should have gained a basic understanding of the value and basic concepts of OSGi,

You should possess basic knowledge of the IBM® WebSphere® Application Server (WAS) version 8.0 administration console.

To follow this exercise, you will require:

- This document.
- The OSGi bundle files that accompany this exercise.
- IBM® WebSphere® Application Server Version 8.0 Environment (henceforth "WAS") installed and configured with a cluster defined as in Lab 1.

2.2 About the application you will deploy

You will deploy a web application that manages bank accounts. The web application consists of a single OSGi composition which consists of three OSGi bundles.

1. The **BankingApplication** OSGi application provides operations to open, close, deposit to, withdraw from and access bank accounts. It also provides operations to work with bank account owners. It includes a front-end JSP Web application for working with bank accounts and their owners.

This diagram depicts the overall design of the OSGi web application:



2.3 A closer look at the OSGi application

The "BankingApplication" OSGi application is a deployable unit containing three bundles that work together to provide banking services including management of accounts and account owners.

- The API bundle, com.ibm.example.banking.api, contains a Java interface and two data classes that together define the public API of the banking application. There is no business logic within the bundle.
- The implementation bundle, com.ibm.example.banking.impl, contains the main Java
 implementation class that implements the Java interface in the API bundle, and has the
 business logic that does all the internal work of creating, storing, accessing, updating and
 deleting bank accounts and bank account owners.

The bundle also defines the implementation class as an OSGi Blueprint bean, and defines an OSGi Blueprint service based upon the bean and described by the implementation's parent interface from the API bundle.

 The Web bundle, com.ibm.example.banking.web, contains a JSP Web application for working with the bank accounts and account owners. The Web application consults the WAS JNDI service to locate the Blueprint service registered by the implementation bundle so that it can invoke operations without requiring a direct dependency on the implementation bundle or the implementation class within it.

2.4 Conventions

The **bold typeface** is used for text you need to enter or controls or objects such as push buttons and tree nodes that you need to interact with.

The *italic typeface* is used for dialog titles, control labels and other information displayed by the tools.

A few "variables" are used in this exercise to represent host names, port numbers and other configurable aspects of WAS. The values shown here match the configuration of the VMware images accompanying the exercise. If you are following this exercise on your own installation, you may need to substitute different values.

Variable	Value	Explanation
<files></files>	/Labfiles 80	The directory containing files needed to complete the exercise.
<host></host>	Think	The local host name.
<http-port></http-port>	9080	The WAS HTTP port number. This is used in the URLs of the OSGi application's JSP Web front end in the com.ibm.example.banking.web bundle.

2.5 Part 1: Start the WAS Environment

In this part of the exercise you will start the WAS Environment if it is not already started and import and deploy the BankingApplication OSGi application. If the WAS Environment is already started, skip to Part 2.

____1. Start WAS.

- ____ p. Start the Deployment Manager
 - 1) Select Applications → IBM Websphere → IBM WebSphere Application Server Network Deployment → Profiles → Dmgr01 → Start the deployment manager
 - 2) Wait for the start process to complete
- ____ q. Start the nodeagent
 - 1) Start a terminal window by right clicking anywhere on the open desktop and select **Open Terminal**.
 - 2) Change directory to the AppSrv01 profile bin directory by entering the command "cd /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin
 - 3) Start the nodeagent by entering the command "**./startNode.sh**" Be sure to note the "**./**" which prefaces the command. This signals to the OS command processor that this command is in the local directory.
 - 4) Wait for the messages that indicate that the nodeagent has successfully been started. You should see output that looks like the following example. The process id will vary

ADMU0116I: Tool information is being logged in file

/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/nodeagent/startServer.log ADMU0128I: Starting tool with the AppSrv01 profile ADMU3100I: Reading configuration for server: nodeagent ADMU3200I: Server launched. Waiting for initialization status. ADMU3000I: Server nodeagent open for e-business; process id is 5615

- _____r. Start the MyCluster cluster using one of the following methods. Option 1 is to use the wsadmin command line administration tool. The other option is to use the web browser based Admin Console GUI. Use one of the two options below.
 - 1) Invoke the wsadmin command from a terminal window(enter exactly as shown including the quotes on a single command line)

/opt/IBM/WebSphere/AppServer/profiles/Dmgr01/bin/wsadmin.sh -lang jython -C "AdminClusterManagement.startSingleCluster('MyCluster')"

The system will display a prompt window requesting your credentials. Login with User and Password values of "**wasadmin**" You will see the following output in the terminal screen, indicating that the cluster was successfully started:

WASX7209I: Connected to process "dmgr" on node thinkCellManager01 using SOAP connector; The type of process is: DeploymentManager

AdminClusterManagement:Start a clusterCluster name:MyClusterUsage: AdminClusterManagement.startSingleCluster("MyCluster")Return: If the command is successful, a value of 1 is returned.

Start cluster:

WebSphere:name=MyCluster,process=dmgr,platform=common,node=thinkCellMan ager01,version=8.0.0.0,type=Cluster,mbeanIdentifier=MyCluster,cell=thinkCell01,sp ec=1.0 OK: startSingleCluster('MyCluster', 'false'):

_ 16.Close the terminal window by entering the command "exit".

____ s. OR use the Admin Console

- 1. Open a Mozilla Firefox web browser window
- 2. Open a session with the Deployment Manager admin interface
- 3. enter the URL <u>http://localhost:9060/admin</u>

ibm.com http://localhost:9060/admin

4. Login with UserID and Password of "wasadmin"



- 5. Expand Servers → Clusters
- 6. Select WebSphere application server clusters



7. Select the MyCluster entry and click on the Start button

Cell=thinkCell01, Profile=Dmgr01	
WebSphere application server clusters	? -
WebSphere application server clusters	
Use this page to change the configuration settings for a cluster. A serve	r cluster consists of a group of
application servers. If one of the member servers fails, requests will be	routed to other members of the cluster.
Learn more about this task in a guided activity. A guided activity provide	es a list of task steps and more general
information about the topic.	
New Delete Start Stop Ripplestart Immedia	teStop
Select Name 🗘 Status 🖄	
You can administer the following resources:	
MyCluster *	
Total 1 1	

After a short time, the Status will turn into a green arrow to indicate that it successfully started.

Cell=thinkCell01, Profile=Dmgr01				
WebSphere application server clusters	2 -			
WebSphere application server clusters				
Use this page to change the configuration settings for a clu application servers. If one of the member servers fails, requ Learn more about this task in a <u>guided activity</u> . A guided ac information about the topic.	ster. A server cluster consists of a group of lests will be routed to other members of the cluster. tivity provides a list of task steps and more general			
Preferences				
New Delete Start Stop Ripplestart	ImmediateStop			
Select Name 🗘	Status 👲			
You can administer the following resources:				
MyCluster_	⇒			
Total 1				

8. Continue to the next section.

2.6 Part 2: Deploy the OSGi BankingApplication Web app

In this part of the exercise, you will take several java archive files which are packaged as OSGi bundles. You will import them into the WAS internal bundle repository from where they can be made accessible to an OSGi application. The repository may contain multiple versions of a bundle and each OSGi application can utilize the desired version based. This mechanism allows for multiple versions of the same java class to be loaded in the WAS jvm and be used at the appropriate version by the requesting application.

- __1. Import the BankingApplication OSGi bundles.
- a) Log on to the WAS Admin Console.
- b) Expand Environment
- c) Expand OSGi bundle repositories
- d) Select Internal bundle repository

Security
Environment 1
Virtual hosts
Update global Web server plug-in configuration
WebSphere variables
Shared libraries
SIP application routers
Replication domains
Naming
OSGi bundle repositories 2 Bundle cache
External bundle repositories
Internal bundle repositor 3

e) Click on the **New...** button

Internal bundle repository

The internal bundle repository can store bundles that are referenced by OSGi applicat WebSphere Application Server. When an OSGi application is imported as an asset, th attempts to satisfy all its dependencies by using the contents of the asset, the conte bundle repository, and the contents of any available external bundle repositories.

Preferences	
New Delete	
Select Bundle Symbolic Name 🛟	Bundle Version 🗘
None	
Total 0	

f) Click on the **Browse...** button

oad a bu	ndle into the internal	bundle repository.		
Path	o bundle			
۲	ocal file system			
SI SI	ecify path	Browse		
	lamota fila system			
	pecify path			
			Browse	
ок	Cancel			
g) Navigate to the **/Labfiles80/OSGiApplication** folder and select the **com.ibm.example.banking.api_1.0.0.jar** file and click the **OK** button.

Internal bundle repository	2 -
Internal bundle repository > New	
Upload a bundle into the internal bundle repository.	
Path to bundle O Local file system Specify path ple.banking.api_1.0.0.jar Browse_	
Remote file system Specify path	Specifies whether to browse the local machine Browse
OK Cancel	

- h) Repeat steps (f) and (g) for the following two additional jar files
 - 1. com.ibm.example.banking.impl_1.0.0.jar
 - 2. com.ibm.example.banking.web_1.0.0.jar
- 2. Import the BankingApplication enterprise bundle application (EBA)
- a) Within the Navigation frame on the left side, expand Applications
- b) Expand Application Types
- c) Select Assets



- d) Click on the **Import** button
- e) Click on the Browse... button
- f) Navigate to the **/Labfiles80/OSGiApplication** folder and select the **BankingApplication_1.0.0.eba** file.

Upload asset
Select the asset package to import.
Path to the asset
Iccal file system
Specify path
ngApp/BankingApplication_1.0.0.eba Browse
○ Remote file system
Specify path
Next Cancel

- i) Click on the **Next** button.
- j) Click on Next through Steps 1 and 2. Ignore any warnings that might appear.
- k) On Step 3: Summary, Click on the **Finish** button.

Step 1: Select	Summary
options for importing an ass e t	The following is a summary of your selections. Click Finish to complete the application creation. If there are settings that you
Step 2: EBA asset	want to change, click Previous to review the settings.
conversion and	
resolution warnings	Summary:
Step 3: Summary	Asset name : Asset name : BankingApplication_1.0.0.eba
	Asset description : BankingApplication
	Asset binaries destination URL : \$ {USER_INSTALL_ROOT}/installedEBAs /BankingApplication_1.0.0
	Asset type aspects : WebSphere:spec=EBA,version=1.0

You should soon see the result that the asset has been successfully added.

10/7/11 1:59:32 AM EDT Completed res=[WebSphere:assetname=BankingApplication_1.0.0.eba] Operation completed successfully.

- 3. Create the BankingApplication business level application (BLA)
- a) Within the Navigation frame on the left side, Select Business-level applications
- b) Click on the New... button
- c) Type "**Banking Application**" in the Name field. Also type a suitable description such as "**OSGi banking application**" into the Description field and click on the **Apply** button

eneral Properties			
Name Banking Application			
Description		_	
<u>QSGi</u> banking applicat	ion		

- d) Click on the Add button in the "Deployed Assets" sectione) Click on the Add Asset selection
 - Messages
 Banking Application was successfully created.
 Changes have been made to your local configuration. You can:
 Save directly to the master configuration.
 Review changes before saving or discarding.
 The server may need to be restarted for these changes to take effect.

 Business-level applications > Banking Application

Use this page to manage the composition units in the business-level application.

General Properties				
Name				
Banking Application				
Description				
QSGi banking application				
Deployed assets 2, 2				
Add				
Add Asset				
Add Shared Library				
Colort		_		•
Select Name	Description	Туре	Status	Q
None				
Business-level applications				
Add Delete				

f) Select the **BankingApplication_1.0.0.eba** asset and click on the **Continue** button

ISHIESS IEV	rerapplications				
Messages					
Δ Changes have been made to your local configuration. You can:					
 <u>Save</u> directly to the master configuration. 					
 <u>Review</u> changes before saving or discarding. 					
⚠ The server may need to be restarted for these changes to take effect.					
Business-	Business-level applications > Banking Application > Add				
Add assets to the business-level application to create a composition unit.					
Select Na	ame 🗘	Description 🗘			
BankingApplication_1.0.0.eba BankingApplication					
Total 1					
Continue Cancel					

- g) Accept the defaults for Step 1 by clicking on the **Next** button.
- h) For Step 2: Map composition unit to a target, be sure to select both the MyCluster cluster and the webserver1 and click on the arrow pointing to the right. This will deploy the application to both the cluster and instruct WAS to configure the webserver plugin correctly. Click on the **Next** button to continue.

Step 1: Set options	Map composition unit to a target
Step 2: Map composition unit to a target	Current targets
Step 3: Map context roots	Available: WebSphere:cluster=MyCluster WebSphere:node=thinkNode01,server=webserver1
Step 4: Map modules to virtual hosts	

i) Enter "/BankingApplication" into the Context Root field and click on the Next button.

Step 1: Set options	Map context roots			
Step 2: Map	Bundle Symbolic Name	Bundle Version	Context Root	
composition unit to a target	com.ibm.example.banking.web	1.0.0.201109270848	/BankingApplication 🗲	
Step 3: Map context roots				
Step 4: Map modules to virtual hosts				
Step 5: Summary				

- j) On Step 4: Map modules to virtual hosts, click on the **Next** and then the **Finish** button to complete the definition.
- k) Be sure to review and save the changes to the configuration and synchronize the changes to the cell.

Adding composition unit to the business-level application
Adding composition unit to the business-level application
The current state of composition unit addition.
и И
10/3/11 10:40:52 AM EDT Completed res=[WebSphere:cuname=BankingApplication_1.0.0_0001.eba]
Operation completed successfully.
Changes have been made to your local configuration. You can: • <u>Save</u> directly to the master configuration. • <u>Review</u> changes before saving or discarding.
To work with the application, click the "Manage application" link.
Manage application
Adding composition unit to the business level application 2
Adding composition unit to the business-level application > Save
Save your workspace changes to the master configuration.
Click Save to update the master repository with your changes. Click Discard to discard your changes and
begin work again using the master repository configuration. Click Cancel to continue working with your
changes.
Total changed documents: 15
Syncaronize changes with Nodes
Save Discard Cancel

 Since the default is to not start the application upon distribution, you will need to manually start the application. Select the **Banking Application** which you just created and click on the **Start** button.

usiness-level applications		2 -				
Business-level applications						
Use this page to manage business-level a represents any artifacts that the applicatio Enterprise Edition (Java EE) applications applications.	applications. A business-level appl n needs to run. Artifacts typically ir or modules, shared libraries, data	ication is a configuration that iclude Java(TM) Platform, files, or other business-level				
Preferences						
Start Stop New Delete]					
Select Name 🗘	Description 🗘	Status 🖄				
You can administer the following resource	ces:					
Banking Application	OSGi Banking application	*				

4. Configure the webserver so it can route requests to the newly deployed application. Expand the Servers then Server Types in the navigation panel. Then click on the Web servers link



5. Select webserver1 and click on the Generate Plug-in button.



_____6. Reselect **webserver1** and click on the **Propagate Plug-in** button

Web servers					? -		
Webservers							
Use this page to view a list of the installed web servers.							
🗉 Preferences 🛛 2 🥆	Preferences 2						
Generate Plug-in Propagate Plug-in New Delete Templates Start Stop Terminate							
Select Name 🗘	Web server Type $\hat{\circ}_{_}$	Node 🗘	Host Name 🔶	Version 🗘	Status 🗳		
You can administer the fo	You can administer the following resources:						
webserver1	IBM HTTP Server	thinkNode01	think.ibm.com	ND 8.0.0.0	*		
Total 1	Total 1 1						

_____7. Lastly, start the Web server by reselecting **webserver1** and click on the **Start** button.

/eb servers ?						
Webservers						
Use this page to view a list of the installed web servers.						
Preferences						
Generate Plug-in Propagate Plug-in New Delete Templates Start Stop Terminate						
Select Name 🗘	Web server Type 🗘	Node 🗘	Host Name 🔶	Version 🗘	Status 🖄	
You can administer the following resources:						
webserver1	IBM HTTP Server	thinkNode01	think.ibm.com	ND 8.0.0.0	8	
Total 1 1	Total 1					

8. Ensure that the Status for webserver1 turns green to indicate that it has successfully started. You may also notice a message in the top of the panel.

Veb servers						?
	🗆 Message	s				
Server thinkNode01/webserver1 started successfully. The collection may need to						
	be refreshed to show the current server status.					
Webservers						
Use this page	to view a list o	of the installed web server	s.			
Preference	s					
Generate	Plug-in Pr	opagate Plug-in Nev	Delete Ter	mplates Start	Stop Te	rminate
	*					
Select Name	\$	Web server Type \hat{v}_{\downarrow}	Node 🔶	Host Name 🔶	Version $\hat{\mathbf{v}}_{\mathbf{I}}$	Status ሷ
You can administer the following resources:						
webse	erver1	IBM HTTP Server	thinkNode01	think.ibm.com	ND 8.0.0.0	÷
Total 1						

In this part of the exercise you started the WAS Environment, imported, deployed, and started the Java EE "BankingApplication" OSGi application. You also generated an updated webserver plugin configuration to support the new application.

2.7 Part 3: Use the OSGi BankingApplication Web app

In this part of the exercise you will use the Web front-end of the OSGi application to create an account owner, open a bank account and deposit some funds. You will also monitor the WAS **SystemOut.log** files for both servers in the cluster to validate that the application is working as desired.

- ___1. Monitor the SystemOut.log file
 - a) Start a terminal window by right clicking anywhere on the open desktop and select **Open Terminal.**



b) Resize the window by dragging a corner so that it covers most of the width of the screen, but only about 1/4 of the height of the screen.



c) Enter the command "tailf /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server2/SystemOut.log"



- d) Start another terminal window by right clicking anywhere on the open desktop and select **Open Terminal.**
- e) Resize the window by dragging a corner so that it covers most of the width of the screen, but only about 1/4 of the height of the screen.
- f) Enter the command "tailf /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server3/SystemOut.log"



17.Launch the Web application in the Mozilla Firefox browser.

a) Select Applications → Internet → FireFox web browser



- b) Open http://localhost/BankingApplication/index.jsp
- c) You should see the *International Bank of Bundles Web* application page like below. International Bank of Bundles

Access Accounts		
Balance: Account number	Get balance	
Deposit: Account number	\$	Deposit
Withdraw: Account number	\$	Withdraw
Administer Clients		
Client ID First Name Last Name		
Add new client: First name	Last name	Add new client
Administer Accounts		
Account Number Balance Owner		
Add new account: Client ID	Add new account	
Refresh		
Purge all clients and accounts!		

18.Create an account owner.

- a) In the *Administer Clients* section of the Web application, enter the following names into the **First name** and **Last name** fields, then press **Add new client**.
 - 1. First name = John
 - 2. Last name = Doe
- b) The status message "Owner 100 added successfully" should appear in the grey status area.
- c) Inspect both of the SystemOut.log tails. In one of the windows, you should see several lines of output produced by System.out.println(...) calls that are instrumented throughout the Java implementation classes of the application. For instance, after step [a] above, the last few lines of the console should read as follows:

```
com.ibm.ws.webcontainer.servlet.ServletWrapper init SRVE0242I:...
[OSGi] AccountManagerImpl.getOwners() = []
[OSGi] AccountManagerImpl.getAccounts() = []
[JSP] index.jsp: owners = []
[JSP] index.jsp: accounts = []
com.ibm.ws.webcontainer.servlet.ServletWrapper init SRVE0242I:...
[Servlet] AddAOwnerServlet(...
[Servlet] AddAccountServlet(...) firstName=John
[Servlet] AddAccountServlet(...) lastName=Doe
[OSGi] AccountManagerImpl.createOwner(Doe,John) = 100
[OSGi] AccountManagerImpl.getOwners() =
  [Owner{id=100, firstName=John, lastName=Doe}]
[OSGi] AccountManagerImpl.getAccounts() = []
[JSP] index.jsp: owners =
  [Owner{id=100, firstName=John, lastName=Doe}]
[JSP] index.jsp: accounts = []
```

19.Create an account.

- a) In the *Administer Accounts* section of the Web application, enter the client number **100** into the Client ID field, then press **Add new account**.
- b) The status message "Account 1000 opened successfully" should appear in the grey status area.
- c) Again, inspect the two **SystemOut.log** displays.

20.Deposit funds into the account.

a) In the *Access Accounts* section of the Web application, enter account number **1000** into the **Deposit: Account number** field, enter **10000** into the **\$** field, then press **Deposit**.

- b) The status message "Funds in the amount \$10,000.00 deposited to account 1000. The new balance s \$10,000.00." should appear in the grey status area.
- c) Again, inspect the two **SystemOut.log** displays.
 - 21.Keep both of the terminal windows open and maintain the tailf commands.

In this part of the exercise you used the OSGi Web application to create a new account owner (or client) and a new bank account. You deposited funds into the bank account which will be important if you are going to buy any stock in the next part of the exercise. You also monitored the SystemOut.log files to determine which server instance handled the request.

2.8 Part 4: Deploy an update to the OSGi BankingApplication Web app

In this part of the exercise, you will be provided an update OSGi bundle file which is provided as a java archive file. During the initial testing of the application, it was discovered that the starting value for clientIDs and account numbers was wrong. Instead of 100, the starting value for client IDs is supposed to be 200. The starting account number is also supposed to be 2000 instead of 1000. As a result, the development team has generated an updated implementation bundle and you need to import and activate this update for the next round of testing. You will import this bundle into the WAS internal repository from where it can be made be used to update the deployed OSGi BankingApplication. As you will see, the repository may contain multiple versions of a bundle. As long as the OSGi Composition permits, the System Administrator will determine which version will be the desired version based. This allows a System Administrator to be able to load and test updates (or roll back changes) quickly and efficiently.

- _ 1. Import the updated BankingApplication OSGi bundle.
- a) Log on to the WAS Admin Console.
- b) Expand Environment
- c) Expand OSGi bundle repositories
- d) Select Internal bundle repository

± Sec	urity	
😑 Env	vironment 🔶 1	
	Virtual hosts	=
-	Update global Web server plug-in configuration	
	WebSphere variables	
	Shared libraries	
	SIP application routers	
	Replication domains	
1	Naming DSGi bundle repositories 2 Bundle cache	
	External bundle repositories	
	Internal bundle repositor - 3	_
± Sys	tem administration	
- ···		

e) Click on the New... button



f) Click on the Browse... button

<u>Inte</u> Uple	al bundle repository > New d a bundle into the internal bundle repository.	<i>c</i> –
	Path to bundle	
	Specify path Browse	

g) Navigate to the **/Labfiles80/OSGiApplication/Updates** folder and select the **com.ibm.example.banking.impl_1.0.1.jar** file.

Internal bundle repository Internal bundle repository > New Upload a bundle into the internal bundle repository.	? .
Path to bundle © Local file system Specify path ple.banking.api_1.0.0.jar © Remote file system Specify path	Specifies whether to browse the local machin
OK Cancel	Browse

- h) Save and synchronize changes.
- _ 1. Update the BankingApplication enterprise bundle application (EBA)
- a) Within the Navigation frame on the left side, expand **Applications**

b) Expand Application Types

c) Select Assets

± Servers
- Applications
New Application Application Types WebSphere enterprise applications
 Business-level applications Assets Global deployment settings

d) Select the BankingApplication_1.0.0.eba asset.

Cell=thinkCell01, Profile=Dmgr01				
Assets	?			
Assets				
Use this page to manage assets in the asset repository. Asset include compressed (zip) files, Enterprise JavaBean (EJB) Ja Component Architecture (SCA) composite JAR files, mediation EE contents such as PHP applications.	s represent physical binaries. Examples of assets va(TM) archive (JAR) files, EAR files, Service n JAR files, shared library JAR files, and non-Java			
* Preferences				
Import Delete Update Export				
Select Name 🗘 Description 🗘				
You can administer the following resources:				
BankingApplication_1.0.0.eba				
Total 1				

e) On the far right hand section of the primary panel, under Additional Properties, select **Update bundle versions in this application**



 f) Click on the pulldown for the com.ibm.example.banking.impl bundle and select the 1.0.1.201109270848 version. Then click on the Preview button

ssets							
Assets > BankingApplication 1.0.0.eba > Update bundle versions in this application Update the versions of the bundles that comprise this application.							
Application bundle content							
Symbolic Name	Content Type	Sharing	Deployed Version	New Version			
com.ibm.example.banking.api	Bundle	Isolated	1.0.0.201109270848	No preference 👤			
com.ibm.example.banking.impl	Bundle	Isolated	1.0.0.201109270744	No preference			
com.ibm.example.banking.web	Bundle	Isolated	1.0.0.201109270848	No preference 1.0.0.201109270744			
Preview Cancel	com.ibm.example.banking.web Bundle Isolated 1.0.0.2011092707848 1.0.0.201109270744 Preview Cancel 2 1.0.1.201109282146 1.0.1.201109282146						

g) Notice the informational message. Although the application definition has been updated, it will not take effect until the BLA is updated to use the new deployment. This will occur the next time the application is restarted, or when an Administrative action to perform the update has been performed. Click on the Create button to generate the updated deployment.

ssets > BankingApplication 1.0.0.	eba > Update bundle version	ns in this application > Previe			
A preview of the result of the proposed changes to the bundle versions in this application.					
The selected bundle versions can be resolved, so you can now create a new deployment with the proposed bundle versions. The new deployment will not affect any composition units for this asset until the composition units are updated to use the new deployment.					
units for this asset until the comp	position units are updated to u	ise the new deployment.			
units for this asset until the comp Application bundle content	position units are updated to u	ise the new deployment.			
units for this asset until the comp Application bundle content Symbolic Name	Deployed Version	New Version			
units for this asset until the comp Application bundle content Symbolic Name com.ibm.example.banking.api	Deployed Version	New Version			
units for this asset until the comp Application bundle content Symbolic Name com.ibm.example.banking.api com.ibm.example.banking.impl	Deployed Version 1.0.0.201109270848 1.0.0.201109270744	Isse the new deployment. New Version 1.0.0.201109270848 1.0.1.201109270848			

h) Click on the OK button to complete processing of the **BankingApplication** asset.



i) Save and synchronize changes.

- __ 2. Update the BankingApplication business level application (BLA)
- a) Within the Navigation frame on the left side, Select **Business-level applications**
- b) Within the main frame, select the **Banking Application** BLA.

Star	t Stop New Delete]	
	1 # \$		
Select	Name 🗘	Description 🗘	Status 🗘
Youc	an administer the following resour	ces:	
	Banking Application	OSGi Banking application	€

c) Click on the **BankingApplication_1.0.0_0001.eba** asset link

Name					
Bankin	g Application				
Descrip	otion				
OSGi E	anking application				
Deploy	ed assets				
Deploy	ed assets				
Deploy Add	ed assets				
Deploy Add	ed assets				
Deploy Add	ed assets	Description	Туре	Status	¢

d) Click on the Update to latest deployment ... button



e) Review the differences between the currently Deployed Version and the New Version to be sure that they are correct. Then click on the **OK** button



g) Be sure to review and save the changes to the configuration and synchronize the changes to the cell.



2.9 Part 5: Validate the updated OSGi BankingApplication Web app

As before you will use the Web front-end of the OSGi application to create an account owner, open a bank account and deposit some funds.

- ____1. Launch the Web application in the Mozilla Firefox browser.
- a) Select Applications → Internet → FireFox web browser



b) Open http://localhost/BankingApplication/index.jsp

c) You should see the *International Bank of Bundles Web* application page like below.

International Bank of Bundles

Access Accounts		
Balance: Account number	Get balance	
Deposit: Account number	\$	Deposit
Withdraw: Account number	\$	Withdraw
Administer Clients		
Client ID First Name Last Name		
Add new client: First name	Last name	Add new client
Administer Accounts		
Account Number Balance Owner		
Add new account: Client ID	Add new account	
Refresh		
Purge all clients and accounts!		

- 2. Create an account owner.
- a) In the *Administer Clients* section of the Web application, enter the following names into the **First name** and **Last name** fields, then press **Add new client**.
 - 1. First name = Jane
 - 2. Last name = Doe
- b) The status message "Owner 200 added successfully" should appear in the grey status area. **This verifies that the updated implementation bundle is being used**.
- c) Inspect both of the SystemOut.log tails. In one of the windows, you should see several lines of output produced by System.out.println(...) calls that are instrumented throughout the Java implementation classes of the application. For instance, after step [a] above, the last few lines of the console should read as follows:

```
com.ibm.ws.webcontainer.servlet.ServletWrapper init SRVE0242I:...
[OSGi] AccountManagerImpl.getOwners() = []
[OSGi] AccountManagerImpl.getAccounts() = []
[JSP] index.jsp: owners = []
[JSP] index.jsp: accounts = []
```

```
com.ibm.ws.webcontainer.servlet.ServletWrapper init SRVE0242I:...
[Servlet] AddAOwnerServlet(...) firstName=Jane
[Servlet] AddAccountServlet(...) lastName=Doe
[OSGi] AccountManagerImpl.createOwner(Doe,Jane) = 200
[OSGi] AccountManagerImpl.getOwners() =
  [Owner{id=200,firstName=Jane,lastName=Doe}]
[OSGi] AccountManagerImpl.getAccounts() = []
[JSP] index.jsp: owners =
  [Owner{id=200,firstName=Jane,lastName=Doe}]
[JSP] index.jsp: accounts = []
```

- ___ 3. Create an account.
- d) In the *Administer Accounts* section of the Web application, enter the client number **200** in the Client ID field, then press **Add new account**.
- e) The status message "Account 2000 opened successfully" should appear in the grey status area. This verifies that the updated implementation bundle is being used.
- f) Again, inspect the two **SystemOut.log** displays.

_ 4. Deposit funds into the account.

- g) In the *Access Accounts* section of the Web application, enter account number **2000** into the **Deposit: Account number** field, enter **10000** into the **\$** field, then press **Deposit**.
- h) The status message "Funds in the amount \$10,000.00 deposited to account 2000. The new balance s \$10,000.00." should appear in the grey status area.
- i) Again, inspect the two **SystemOut.log** displays.
- 5. Press **Ctrl+C** in each of the command windows where you have been monitoring the SystemOut.log files. This will terminate the tailf command.
- 6. Enter the "exit" command in each of the command windows. This will close out the terminal windows.

In this part of the exercise you used the updated OSGi Web application to create a new account owner (or client) and a new bank account. You verified that the updated module was used to create client IDs and account numbers using the new ranges.

Congravulations!

You have reached the end of the exercise!

2.10 Conclusions

In this exercise, you the WebSphere Application Server Runtime Environment to import, deploy, run and test a java application packaged using the OSGi models.

You explored the various WAS Admin GUI capabilities for OSGi bundle and application management, including how to import bundles to the local repository and update a running OSGi application.

Optionally, you were able to explore weadmin scripting equivalents to the administrative tasks you performed through the interactive console.

Lab 3 High Performance Extensible Logging

High Performance Extensible Logging (HPEL) is a new log and trace facility. It provides a convenient mechanism for storing and accessing log, trace, System.err, and System.out information produced by the application server or applications. It is an alternative to the basic log and trace facility, which provides the JVM logs, diagnostic trace, and service log files commonly named SystemOut.log/SystemErr.log, trace.log, and activity.log. HPEL provides a log data repository, a trace data repository, and a text log file.

For more information about HPEL, see the following WebSphere Application Server V8.0 information center topic: **Using HPEL to troubleshoot applications**

This lab is provided AS-IS, with no formal IBM support.

3.1 Lab requirements

Lab 1 WebSphere Application Server V8 Network Deployment Installation and Configuration completed.

3.2 What you should be able to do

At the end of this lab you should be able to

- Enable and configure HPEL.
- Use the HPEL command line log viewer.
- Use the HPEL log viewer included in the WebSphere administrative console.

3.3 Introduction

This lab is intended as a short primer new High Performance Extensible Logging capability in WAS V8.

The aim of the lab is to walk though the steps that a systems administrator would perform to enable and use HPEL from a command and the WAS V8 administrative console.

3.4 Exercise instructions

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

Reference variable	Windows [®] location	Linux [®] or UNIX [®] locations
<was_home></was_home>	C:\IBM\WebSphere\AppServer	/usr/WebSphere/AppServer /opt/WebSphere/AppServer
<profile_ho ME></profile_ho 	C:\IBM\WebSphere\AppServer\profile s\AppSrv01	/usr/WebSphere/AppServer/pro files/AppSrv01 /opt/WebSphere/AppServer/pro files/AppSrv01
<lab_files></lab_files>	C:\Labfiles80	/Labfiles80
<temp></temp>	C:\temp	/tmp

Note for Windows users: When directory locations are passed as parameters to a Java program such as EJBdeploy or wsadmin, it is necessary to replace the backslashes with forward slashes to follow the Java convention. For example, C:\Labfiles80\ would be replaced by C:/Labfiles80/

3.5 Enable and Configure HPEL.

1. Log into the Admin console and inside the console navigate to Troubleshooting -> Logs and Trace -

Bei	/erz											
View:	All tasks 🔷	Ce	Cell=thinkCell01, Profile=Dmgr01									
Weld	come		ogging and traci	20								
🖌 Guid	ed Activities		ogging and hach	ig								
• Serve	ers	Logging and tracing										
Appli	cations	I lea this name to sharify how the server handles for records. You can select an application server to enable or										
Jobs			disable a system log for that server specify where log data is stored, and choose a format for log content. You									
Servi	ces		can also specify a log detail level for components and groups of components.									
Reso	urces		Preferences									
Secu	rity											
Envir	ronment											
Syste	m administration		Server 🗘	Node 🗘	Host Name 🗘	Version 🗘	Туре 🗘	Status 🗳				
User	s and Groups	You can administer the following resources:										
Moni	toring and Tuning	dmgr thinkCellManager01 think ibm com ND 8 0 0 0 servers						e				
Trout	bleshooting							4				
= [ogs and trace		nodeagent	thinkNode01	think.ibm.com	ND 8.0.0.0	servers	7				
	Configuration problems		server2	thinkNode01	think.ibm.com	ND 8.0.0.0	servers	<₽				
= ;	ava dumps and cores		server3	thinkNode01	think.ibm.com	ND 8.0.0.0	servers					
€ C	onfiguration Validation				1							
• D	iagnostic Provider		Total 4									
∎ R	untime Messages											
Servi	ce integration											
UDD	1											

2. Click the Switch to HPEL Mode button and Save this configuration change. Note enabling HPEL is made to one server at a time. You will need to restart the server for HPEL to take affect. We will restart the server in a later step.



Click the OK button. You will return to the Logging and tracing screen. Chose server
 2 to review and configure the HPEL settings.

4. Select Configure HPEL Logging.



_____a. On the HPEL Log Configuration page we can customize a variety of logging properties. Review the different logging configuration options on this page. Note the drop down options under Begin cleanup of oldest records checkbox option and the Out of space action drop down. Change the Maximum log size to 20 and the click the OK button. Do not Save yet.

Logging and tracing > server2 > HPEL Log Configuration

Use this page to configure High Performance Extensible Logging (HPEL) log options. The HPEL log can be viewed using the logViewer command (in the profile bin directory), or using the View HPEL Logs and Trace link.

Configuration	
General Properties	Additional Properties
<pre>* Directory path \${SERVER_LOG_ROOT}</pre>	Change log detail levels
Enable log record buffering	
Start new log file daily at: 12 AM	Related Items
Log record purging policies	View HPEL logs and
Begin cleanup of oldest records	trace
when log size approaches maximum	
Log record age limit 48 Hours old	
Maximum log size 20 Megabytes	
* Out of space action Stop logging	
Apply OK Reset Cancel	

5. Next, chose the Configure HPEL trace from the Logging and tracing > server 2

	Logging and tracing ? –	
	Logging and tracing > server2 Use this page to select a system log to configure, or to specify log detail levels for components and groups of components.	
	Configure HPEL logging	
	Current status not available	
	Configure HPEL trace	
	Current status not available	
	Configure HPEL text log	
	Current status not available	
page.		

6. On the HPEL Trace Configuration page we can customize a variety of trace properties. Review the different logging configuration options. Note that we see the same options as on the HPEL Log configuration page with one new option, Trace to a memory buffer. Also note that the directory for the HPEL traces is also used to dump the memory buffer if Trace to a memory buffer is selected. Under the check box Begin cleanup of oldest records, chose when oldest records reach age limit from the drop down box and the change the Log record age limit to 12. Click the OK button. Do not Save yet.

ogging and tracing	2 -				
Logging and tracing > server2 > HPEL Trace Configuration Use this page to configure High Performance Extensible Logging (HP viewed using the logViewer command (in the profile bin directory), or	EL) trace options. The HPEL trace can be using the View HPEL Logs and Trace link.				
Configuration					
General Properties	Additional Properties				
Trace to a directory					
 Fnable log record buffering 	Change log detail levels				
Start new log file daily at: 12 AM	101010				
Log record purging policies	Related Items				
Begin cleanup of oldest records					
when oldest records reach age limit	View HPEL logs and trace				
Log record age limit	uace				
(12) Hours old					
Maximum log size 50 Megabytes					
* Out of space action					
Purge old records -					
 Trace to a memory buffer * Memory Buffer Size 8 MB 					
* Directory to use for tracing and dumping memory buffer					
\${SERVER_LOG_ROOT}					
Apply OK Reset Cancel					

__ 7. . Next chose the Configure HPEL text log from the Logging and tracing > server 2 page.

Logging and tracing							
Logging and tracing > server2							
Use this page to select a system log to configure, or to specify log detail levels for components and groups of components.							
General Properties							
Configure HPEL logging							
Current status not available							
Configure HPEL trace							
Current status not available							
Configure HPEL text log							
Current status not available							

____a. On the HPEL Text Log Configuration page we can customize a variety of text logging properties. The HPEL text log option allows you to output a traditional text

log file along with the binary HPEL files. For production use, you would want turn off the text logging capability by unchecking the **Enable text log** check box. Review the different logging configuration options. Note we see many of the same options that are found on the **HPEL Log configuration page** with two additional options for choosing the **Text output format** and the option to **Include trace records.** Turn off text logging by unchecking the **Enable text** log check box. Click the **OK** button and **Save** these configuration changes. Click the **OK** button on the **Synchronize Changes with Nodes** screen.

8. Go to terminal window and navigate to the

/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server2 directory. Type **Is -al** at the command prompt. Note the directory and file structure.

	root@	thin	k:/op	t/IBM,	WebS	pher	e/A	ppServ	er/profiles/AppSrv01/logs/server2
<u>F</u> ile	<u>E</u> dit	<u>V</u> ie	w <u>T</u> ei	rminal	Ta <u>b</u> s	<u>H</u> elp)		
[roo tota	ot@thi al 68	nk	serve	r2]# 1	ls -al		_		
drw	r-xr-	x 2	root	root	4096	Sep	29	15:56	
d:w	(r-xr-	x 7	root	root	4096	Sep	29	15:55	
- rw-	- r r -	- 1	root	root	168	Sep	29	15:56	native_stderr.log
- rw	rr-	- 1	root	root	2044	Sep	29	15:56	native_stdout.log
- rw	rr-	- 1	root	root	4	Sep	29	15:56	server2.pid
- rw	rr-	- 1	root	root	168	Sep	29	15:56	SystemErr.log
- rw-	rr-	- 1	root	root	41138	Sep	29	23:37	SystemOut.log
[roo	t@thi	nk :	serve	r2]#					

9. Stop server2. Delete all the files in the /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/server2 directory using rm * -f. Start server2 for the new HPEL settings to take affect. Note the new log file and directory structure that is created when running HPEL.

	root	@thi	nk:/op	t/IBM/	/WebS	Sphe	re//	AppSer	ver/profiles/AppSrv01	/logs/server2
<u>F</u> ile	e <u>E</u> dit	<u>V</u> ie	ew <u>T</u> e	rminal	Ta <u>b</u> s	<u>H</u> e	lp			
[ro tot	ot@th al 32	ink	serve	r2]# 1	ls -a	L				
drw	xr-xr	- X 4	root	root	4096	Sep	30	23:15		
drw	xr-xr	-x 7	′ root	root	4096	Sep	29	15:55		
drw	xr-xr	-x 3	3 root	root	4096	Sep	30	23:15	logdata	
- rw	- r r	1	. root	root	168	Sep	30	23:15	native_stderr.log	
- rw	- r r	1	. root	root	1886	Sep	30	23:15	native_stdout.log	
- rw	- r r	1	. root	root	5	Sep	30	23:15	server2.pid	
- rw	- r r	1	. root	root	2434	Sep	30	23:15	startServer.log	
drw	xr-xr	-x 2	2 root	root	4096	Sep	30	23:15	tracedata	
[ro	ot@th	ink	serve	r2]#						

10.In the Admin Console, navigate to Troubleshooting -> Logs and Trace -> server2 and note the screen Logging and tracing > server2 screen now shows the current custom HPEL settings for server2.

this pass to calent a sustam los to config	ure, ar to aposity log datail loyals for astronoments and around of
conents.	ure, or to specify log detail levels for components and groups of
ral Properties	
Saure HPEL logging	
Director	/ont/IDN/Mah Sahara /Ann San /ar/arafilas /Ann San(at /laga/ann)
Directory	/opt/IBM/webSphere/AppServer/profiles/AppSrv01/logs/server/
For cleanup, delete records older than	Disabled
For cleanup, maximum size of logs	20 Megabytes
nfigure HPEL trace	
Directory	/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server
For cleanup, delete records older than	12 Hours
For cleanup, maximum size of trace	Disabled
figure HPEL text log	1
	Dischlad

You're ready to proceed to part 1.6

3.6 Use the HPEL command line log viewer

1. Since you enabled HPEL and restarted the server, the legacy WebSphere Application Server logging information is no longer available. The command line HPEL log viewer provides a powerful, yet simple solution for viewing logging information.

The following WebSphere Application Server V8.0 Information Center topic includes a detailed reference of the command line viewer options: **LogViewer command-line tool**

- _____2. Open a terminal window and navigate to the **/opt/IBM/WebSphere/AppServer/bin** directory to launch the HPEL log viewer.
- 3. At the command prompt, type ./logViewer.sh –help | more to view the HPEL log viewer command line options.
- 4. Create a legacy format log file and compare its contents to the output of several HPEL log viewer commands. Run the following command to create a legacy format log file (legacyFormat.log) that contains only log records (INFO, WARNING, and SEVERE):

./logViewer.sh -outLog ../logs/legacyFormat.log -minLevel INFO -maxLevel SEVERE

[root@think bin]# ./logViewer.sh -outLog ../logs/legacyFormat.log -minLevel INFO -maxLevel SEVERE Using /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server2 as repository directory. Operation Complete Processed 227 records in 0.07 seconds (3,242.857 records per second). [root@think bin]#

_____5. Type cat ../logs/legacyFormat.log | more to view the log file.

	E.									
[root@think bin]# cat/logs/legacyFormat.log more										

10620										
Host Operating System is Linux, version 2.6.18-238.12.1.el5										
/ava version = 1.6.0, Java Compiler = j9jit26, Java VM name = IBM J9 VM										
/as.install.root = /opt/IBM/WebSphere/AppServer										
user.install.root = /opt/IBM/WebSphere/AppServer/profiles/AppSrv01										
Java Home = /opt/IBM/WebSphere/AppServer/java/jre										
ws.ext.dirs = /opt/IBM/WebSphere/AppServer/java/lib:/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/classes:/opt/IBM/WebS	ph									
<pre>are/AppServer/classes:/opt/IBM/WebSphere/AppServer/lib:/opt/IBM/WebSphere/AppServer/installedChannels:/opt/IBM/WebSphere/A</pre>										
ppServer/llb/ext:/opt/IBM/WebSphere/AppServer/web/help:/opt/IBM/WebSphere/AppServer/deploytool/itp/plugins/com.ibm.etool	.s.									
ejbaeptoy/runtime										
<pre>Classpath = /opt/lBM/webSpnere/AppSerVer/protiles/AppSrV01/properties:/opt/lBM/webSpnere/AppSerVer/properties:/opt/lBM/webSpne ////////////////////////////////////</pre>	leb									
Spnere/Appserver/LD/startup.jar:/opt/LBM/WebSpnere/Appserver/LD/bootstrap.jar:/opt/LBM/WebSpnere/AppServer/LD/jst-nts										
ar:/opt/lbm/websphere/Appserver/ll0/lmproxy.jar:/opt/lbm/websphere/Appserver/ll0/urlprotocols.jar:/opt/lbm/websphere/lbm/websphere/lbm/websphere/lbm/websphere/lbm/websphere/lbm/websphere/lbm/websphere/lbm/websphere/lbm/websphere/lbm/websphere/lbm/websphere/lbm	se									
Tver/deployloo//itp/batchboot.jar:/opt/iBm/websphere/Appserver/deployloot/itp/batch2.jar:/opt/iBm/websphere/Appserver/ja	iva									
/ LLD/ LOUES.jdf Java Jinsery path = /ont/TDM/WebShberg/AppServer/lib/pative/linux/v06_37///ont/TDM/WebShberg/AppServer/iava/irg/lib/i306										
Java Library path = /upt/ion/websphere/Appserver/tib/iactve/tihux/xoo_32/./upt/ion/websphere/Appserver/java/jie/tib/iactve/tib/	S D									
eradici, opi, ibn, webshiere Appselver/java/jre/tib/ib00./opi/ibn/webshiere/Appselver/tib/hative/tihu/x60_52/./opi/ibn/web	-sp									
nere-Apperverserner, dariteter.										
************ End Display Current Environment **********										
[9/30/11 23:15:11:116 EDT1 00000000 ManagerAdmin I TRAS00171: The startup trace state is *=info.										
[9/30/11 23:15:11:120 EDT] 00000000 ManagerAdmin I TRAS01111: The message IDs that are in use are deprecated										
[9/30/11 23:15:11:155 EDT] 00000000 ModelMar I WSVR0800I: Initializing core configuration models										
[9/30/11 23:15:11:438 EDT] 00000000 ComponentMeta I WSVR01791: The runtime provisioning feature is disabled. All compo	ne									
nts will be started.										
[9/30/11 23:15:11:488 EDT] 00000000 ProviderTrack I com.ibm.ffdc.osgi.ProviderTracker AddingService FFDC1007I: FFDC Prov	/id									
er Installed: com.ibm.ffdc.util.provider.FfdcOnDirProvider@16db5643										
[9/30/11 23:15:11:494 EDT] 00000000 ProviderTrack I com.ibm.ffdc.osgi.ProviderTracker AddingService FFDC1007I: FFDC Prov	id									
er Installed: com.ibm.ws.ffdc.impl.FfdcProvider@16dbcb11										
[9/30/11 23:15:11:615 EDT] 00000000 AdminInitiali A ADMN00151: The administration service is initialized.										
[9/30/11 23:15:11:820 EDT] 00000000 PluginConfigS I PLGC0057I: The plug-in configuration service started successfully.										
[9/30/11 23:15:11:833 EDT] 00000000 SSLComponentI I CWPKI0001I: SSL service is initializing the configuration										
[9/30/11 23:15:11:837 EDT] 00000000 WSKeyStore W CWPKI0041W: One or more key stores are using the default password.										
[9/30/11 23:15:11:842 EDT] 00000000 SSLConfigMana I CWPKI0027I: Disabling default hostname verification for HTTPS URL	со									
nnections.										
[9/30/11 23:15:11:848 EDT] 00000000 SSLDiagnostic I CWPKI0014I: The SSL component's FFDC Diagnostic Module com.ibm.ws.	SS									
l.core.SSLDiagnosticModule registered successfully: true.										
[9/30/11 23:15:11:848 EDT] 00000000 SSLComponentI I CWPKI0002I: SSL service initialization completed successfully										
[9/30/11 23:15:11:850 EDT] 00000000 DiagnosticCon I com.ibm.wsspi.rasdiag.DiagnosticConfigHome setStateCollectionSpec RA	SD									
00121: Updating State Collection Spec from Uninitialized Value to .*:.*=0										
[9/30/11 23:15:11:852 EDT] 00000000 PMIImpl A CWPMI1001I: PMI is enabled										
[9/30/11 23:15:11:925 EUI] 00000000 WSChannelFram A CHFW00211: Inbound Chain WCInboundAdmin has been marked disabled.										
[9/30/11 23:15:11:92/ EUI] 000000000 WSChannelFram A CHFW00211: Inbound chain WCInboundAdminSecure has been marked disa	וומי									
	4 -									
[9/30/11 23:13:12:02/4 EUI] 000000000 GAPAGENTLOMPO I CWLKSb0001: GAP (Grid Application Placement) Component has initial	.±Z									
eu successinicy un process manageorrocess. 10/20/11 20:15:10/07 ETD 10000000 Cibbergage - T - (1) CMCTU00001, Delence, MACOD ETD Lovel, 41115-20										
[9/30/11 23.15.12.094 EUT] 00000000 SIDMESSAGE I [;] WSID00001: Retease: WAS0.316 LEVEL: 01115.28										
More-	· · w									
	L.									

_ 6. Run the following command to view only the log records for thread 0: ./logViewer.sh - thread 0 We will only see the log file output for thread 0. We can send the output of the log view thread 0 command to a text file with the addition of the –outLog <filename> switch:

./logViewer.sh -outLog myThread0.log -thread 0.

View the output with the cat or the more command .

[root@think bin]# ./logViewer.sh -thread 0 Using /ont/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server2 as repository directory. ************ Start Display Current Environment *********** WebSphere Platform 8.0.0.0 [ND 8.0.0.0 nll18.03] running with process name thinkCell01\thinkNode01\server2 and process id 10620 Host Operating System is Linux, version 2.6.18-238.12.1.el5 Java version = 1.6.0, Java Compiler = j9jit26, Java VM name = IBM J9 VM was.install.root = /opt/IBM/WebSphere/AppServer user.install.root = /opt/IBM/WebSphere/AppServer/profiles/AppSrv01 Java Home = /opt/IBM/WebSphere/AppServer/java/jre ws.ext.dirs = /opt/IBM/WebSphere/AppServer/java/jre ws.ext.dirs = /opt/IBM/WebSphere/AppServer/java/lib:/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/classes:/opt/IBM/WebSphere/AppServer/istalledChannels:/opt/IBM/WebSphere/AppServer/istalledCha ppServer/lib/ext:/opt/IBM/WebSphere/AppServer/web/help:/opt/IBM/WebSphere/AppServer/deploytool/itp/plugins/com.ibm.etools. ejbdeploy/runtime Classpath = /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/properties:/opt/IBM/WebSphere/AppServer/properties:/opt/IBM/Web Sphere/AppServer/lib/startup.jar:/opt/IBM/WebSphere/AppServer/lib/bootstrap.jar:/opt/IBM/WebSphere/AppServer/lib/jsf-nls.j ar:/opt/IBM/WebSphere/AppServer/lib/lmproxy.jar:/opt/IBM/WebSphere/AppServer/lib/urlprotocol.jar:/opt/IBM/WebSphere/AppServer/deploytool/itp/batchboot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.jar:/opt/IBM/WebSphere/AppServer/deploytoot.j /lib/tools.jar Java Library path = /opt/IBM/WebSphere/AppServer/lib/native/linux/x86_32/:/opt/IBM/WebSphere/AppServer/java/jre/lib/i386/d efault:/opt/IBM/WebSphere/AppServer/java/jre/lib/i386:/opt/IBM/WebSphere/AppServer/lib/native/linux/x86_32/:/opt/IBM/WebSp here/AppServer/bin::/usr/lib: Orb Version = IBM Java ORB build orb626fp1-20110419.00 *********** End Display Current Environment [9/30/11 23:15:11:116 EDT] 00000000 ManagerAdmin I [9/30/11 23:15:11:120 EDT] 00000000 ManagerAdmin I ***** TRAS0017I: The startup trace state is *=info. TRAS0111I: The message IDs that are in use are deprecated [9/30/11 23:15:11:155 EDT] 00000000 ModelMgr I [9/30/11 23:15:11:438 EDT] 00000000 ComponentMeta I WSVR0800I: Initializing core configuration models WSVR0179I: The runtime provisioning feature is disabled. All compone nts will be started. [9/30/11 23:15:11:488 EDT] 00000000 ProviderTrack I com.ibm.ffdc.osgi.ProviderTracker AddingService FFDC1007I: FFDC Provid er Installed: com.ibm.ffdc.util.provider.FfdcOnDirProvider@16db5643 19/30/11 23:15:11:494 EDT1 00000000 ProviderTrack I com.ibm.ffdc.osgi.ProviderTracker AddingService FFDC1007I: FFDC Provid

____7. Run the following command to view only WARNING messages:

./logViewer.sh -level WARNING

We can send the output of the log viewer WARNING command to text file like we did in the previous step.

```
[root@think bin]# ./logViewer.sh -level WARNING
Using /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server2 as repository directory.
*********** Start Display Current Environment ********
WebSphere Platform 8.0.0.0 [ND 8.0.0.0 n1118.03] running with process name thinkCell01\thinkNode01\server2 and process id
10620
Host Operating System is Linux, version 2.6.18-238.12.1.el5
Java version = 1.6.0, Java Compiler = j9jit26, Java VM name = IBM J9 VM
was.install.root = /opt/IBM/WebSphere/AppServer
user.install.root = /opt/IBM/WebSphere/AppServer/profiles/AppSrv01
Java Home = /opt/IBM/WebSphere/AppServer/java/jre
ws.ext.dirs = /opt/IBM/WebSphere/AppServer/java/lib:/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/classes:/opt/IBM/WebSph
ere/AppServer/classes:/opt/IBM/WebSphere/AppServer/lib:/opt/IBM/WebSphere/AppServer/installedChannels:/opt/IBM/WebSphere/A
ppServer/lib/ext:/opt/IBM/WebSphere/AppServer/web/help:/opt/IBM/WebSphere/AppServer/deploytool/itp/plugins/com.ibm.etools.
ejbdeploy/runtime
Classpath = /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/properties:/opt/IBM/WebSphere/AppServer/properties:/opt/IBM/Web
Sphere/AppServer/lib/startup.jar:/opt/IBM/WebSphere/AppServer/lib/bootstrap.jar:/opt/IBM/WebSphere/AppServer/lib/jsf-nls.j
ar:/opt/IBM/WebSphere/AppServer/lib/lmproxy.jar:/opt/IBM/WebSphere/AppServer/lib/urlprotocols.jar:/opt/IBM/WebSphere/AppSe
rver/deploytool/itp/batchboot.jar:/opt/IBM/WebSphere/AppServer/deploytool/itp/batch2.jar:/opt/IBM/WebSphere/AppServer/java
/lib/tools.jar
Java Library path = /opt/IBM/WebSphere/AppServer/lib/native/linux/x86_32/:/opt/IBM/WebSphere/AppServer/java/jre/lib/i386/d
efault:/opt/IBM/WebSphere/AppServer/java/jre/lib/i386:/opt/IBM/WebSphere/AppServer/lib/native/linux/x86 32/:/opt/IBM/WebSp
here/AppServer/bin::/usr/lib:
[9/30/11 23:15:12:657 EDT] 00000000 ThreadPoolMgr W WSVR0626W: The ThreadPool setting on the ObjectRequestBroker service
 is deprecated.
Operation Complete
Processed 2 records in 0.053 seconds (37.736 records per second).
[root@think bin]#
```

8. Extract a specified set of log records to a new repository and a text file. Run the following command to extract a repository of just WARNING and SEVERE messages and save the resulting file in a new directory

: ./logViewer.sh -minLevel WARNING

-maxLevel SEVERE -extractToNewRepository ../logs/newHPELRepository

____ a. .Run the following command to export the contents of the resulting repository to a text format log file

: ./logViewer.sh -repositoryDir ../logs/newHPELRepository -outLog ../logs/newFormat.log

____b. Use cat, tail, vi, or a text editor to view the resulting log file, for example: cat .../logs/newFormat.log

3.7 Use the HPEL log viewer included in the WebSphere administrative console

 Log in to the administrative console, specifying an appropriate user ID and password if administrative security is enabled. Next, click *TroubleShooting > Logs and Trace > server2*. Then click View HPEL logs and trace.

ogging and tracing	?						
Logging and tracing > server2 Use this page to select a system log to configure, or to specify log detail levels for components and groups of components. General Properties							
Configure HPEL logging							
Directory	/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server2						
For cleanup, delete records older than	Disabled						
For cleanup, maximum size of logs	20 Megabytes						
Configure HPEL trace							
Directory	/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server2						
For cleanup, delete records older than	12 Hours						
For cleanup, maximum size of trace	Disabled						
<u>Configure HPEL text log</u>							
Current status:	Disabled						
Delated Home							
Change invested and trace							
 Change log and trace mode 	Change log and trace mode						
 Manage process logs 							
NCSA access and HTTP error logg	 Manage process logs NCSA access and HTTP error logging 						

2. Expand the Content and Filtering Details area of the page. Click each server instance (start time) to view the corresponding log messages. Then collapse the Content and Filtering Details area. Since we have only stopped and started the server one time after enabling HPEL, you will probably only see server instance.

Content and Filtering Details



_ 3. Click the (early) log message TRAS0017I to view explanations, user actions, and so on. Then click Close to remove the pop-up window.

Refresh View Show Only Selected Threads Show All Threads Select Columns Export Cop									
Viewing log records from server instance October 1, 2011 17:08:18									
Number of records	20		First Pag						
TimeStamp	Thread ID	Logger	Level	Message					
10/1/11 17:08:18.269		1anagerAdmin		TRAS0017I: The startup trace state is *=info.					
10/1/11 17:08:18.275	00000000	1anagerAdmin	INFO	TRASU111: The message IDs that are in use are deprecated					
10/1/11 17:08:18.319	00000000	nfig.ModelMgr	INFO	WSVR08001: Initializing core configuration models					
10/1/11 17:08:18.651	00000000	tMetaDataMgr	INFO	WSVR0179I: The runtime provisioning feature is disabled. All components will be started.					
10/1/11 17:08:18.725	00000000	oviderTracker	INFO	com.ibm.ffdc.osgi.ProviderTracker AddingService FFDC1007I: FFDC Provider Installed: com.					
10/1/11 17:08:18.732	00000000	oviderTracker	INFO	com.ibm.ffdc.osgi.ProviderTracker AddingService FFDC1007I: FFDC Provider Installed: com.					
10/1/11 17:08:18.891	00000000	AdminInitializer	AUDIT	ADMN0015I: The administration service is initialized.					
4. Locate a log entry, indicating activity on a thread other than 00000000. Select the entry, and click ShowOnly Selected Threads, to filter the list to include only records generated by the same thread. Finally,click Show All Threads to display messages generated by all threads, once again. Note: You may need to scroll through a few pages of the log file to find threads other than 0000000.

	2.			
fresh	n View [🗄	Show Only	Select	ed Threads Show All Threads Select Columns Export Copy to Clipboard Server Instan
ıg log	records from	n server instar	ice Octo	Joer 1, 2011 17:08:18
nber	of records	s to show:	20	First Page Previous Page Next Pag
	Thread ID	Logger	Level	Message
	0000007	TCPC0003E: TCP Channel TCP_5 initialization failed. The socket bind failed for host * and port 9356. The port may already be in use.		
	0000007	l.impl.TCPPort	SEVER	TCPC0003E: TCP Channel TCP_5 initialization failed. The socket bind failed for host * and port 9356. The port may already be in use.
	0000006	I.TCPChannel	INFO	TCPC00011: TCP Channel TCP_5 is listening on host * (IPv6) port 9356.
	0000006	rameworkimpl	AUDIT	CHFW0019): The Transport Channel Service has started chain DCS.
	00000005	rameworkImpl	AUDIT	CHFW00191: The Transport Channel Service has started chain DCS-Secure.
	00000016	JRmmAdapter	INFO	DCSV1032I: DCS Stack DefaultCoreGroup at Member thinkCell01\thinkNode01\server3: Connected a defined member thinkCell01\thinkNode01\server2.
1	00000016	JRmmAdapter	INFO	DCSV1032I: DCS Stack DefaultCoreGroup at Member thinkCell01\thinkNode01\server3: Connected a defined member thinkCell01\thinkCellManager01\dr
1 .	00000016	JRmmAdapter	INFO	DCSV1032I: DCS Stack DefaultCoreGroup at Member thinkCell01\thinkNode01\server3: Connected a defined member thinkCell01\thinkNode01\nodeager
	00000017	LeaderMerge	INFO	DCSV8054I: DCS Stack DefaultCoreGroup at Member thinkCell01\thinkNode01\server3: View change in process.
	00000016	11.VSyncAlgo1	INFO	DCSV2004: DCS Stack DefaultCoreGroup at Member thinkCell01\thinkNode01\server3: View synchronization completed successfully. The View Identifier i

Thread ID	Logger	Level	Message
0000017	vLeaderMerge	INFO	DCSV8054I: DCS Stack DefaultCoreGroup at Member thinkCell01\thinkNode01\server3: View change in process.
00000017	/IBRStateXchg	INFO	DCSV60701: DCS Stack DefaultCoreGroup at Member thinkCellO1tthinkNode01\server3: Updated HA Manager state. New state version is CoreGroup DMGR true, time read 1317352460699, number coordinators 1, numberPreferred 0, numberProcesses 4, version a7a48439137464e2461cc96938
00000017	omponentimpi	INFO	HMGR00861: This server is updating its core group configuration. The new document version is CoreGroupConfig : MemberName dmgr, DMGR tru number coordinators 1, numberPreferred 0, numberProcesses 4, version a7a48439137464e2t461cc96938a78d23101a777.
00000017	oordinatorImpl	INFO	HMGR0228: The Coordinator is not an Active Coordinator for core group DefaultCoreGroup. The active coordinator set is [thinkCell01\thinkCe
00000017	oordinatorImpl	INFO	HMGR0218: A new core group view has been installed. The core group is DefaultCoreGroup. The view identifier is (12:0.thinkCell01\thinkCell01\thinkCellMar members in the new view is 4.
	nbershipLayer		DCSV80501; DCS Stack DefaultCoreGroup at Member thinkCell01\thinkNode01\server3: New view installed, identifier (12:0.thinkCell01\thinkCel

- 5. Show only WARNING and higher level messages.
- ____a. Expand the Content and Filtering Details area of the page.
- ____b. Uncheck System out and System err.
- ____ c. U nder Logs and trace, set Minimum level to WARNING and Maximum level to FATAL.

_____d. Click **Apply** to filter the list. (It may take several seconds for the filtering to be applied). Then, collapse the **Content and Filtering Details** area of the page, and view the resulting messages.

1. View Contents System out System err ✓ Logs and trace 2. Warning warmum level				Filtering Wild cards: *,?,% are allowed Separate multiple entries by a ':' Include loggers: Exclude loggers: Message contents:
3. App	FATAL Res	et Show Only	Select	Event Timing From: On: On: Until: On: On: Copy to Clipboard S
Viewing le	og records fron er of record	m server instan Is to show:	ce Octo	ber 1, 2011 17:08:18 First Page Previous Page
	Thread ID	Logger	Level	Message
19.186	00000000	g.WSKeyStore	WARNI	CWPKI0041W: One or more key stores are using the default password.
20.169	00000000	ıdPoolMgrimpi	WARNI	WSVR0626W: The ThreadPool setting on the ObjectRequestBroker service is deprecated.
21.074	00000000	l.impl.TCPPort	SEVER	TCPC0003E: TCP Channel TCP_5 initialization failed. The socket bind failed for host * and port 9356. The port may already be in use.
21.075	00000000	rameworkImpl	SEVER	CHFW0034W: The Transport Channel Service detected transport chain DCS failed. The service will retry to start chain DCS every 5,000 mil
21.078	00000000	l.impl.TCPPort	SEVER	TCPC0003E: TCP Channel TCP_5 initialization failed. The socket bind failed for host * and port 9356. The port may already be in use.
21.078	00000000	rameworkimpl	SEVER	CHFW0034W: The Transport Channel Service detected transport chain DCS-Secure failed. The service will retry to start chain DCS-Secure attempts.
26.095	00000006	Limpl TCPPort	SEVED	TCPC00035-TCP Channel TCP. 5 initialization failed. The socket bind failed for bost * and not 9356. The not may already be in use

6. Export the filtered view to a binary repository and use the command line log viewer to display the records.

___a. Click Export.

Refresh	Refresh View Show Only Selected Threads Show All Threads Select Columns Export Copy to Clipboard							
Viewing log	Viewing log records from server instance October 1, 2011 17:08:18							
Number	of records	to show:	20	First Page Previous Page				
	Thread ID	Logger	Level	Message				
19.186	00000000	g.WSKeyStore	WARNI	<u>CWPKI0041W</u> : One or more key stores are using the default password.				
20.169	00000000	ıdPoolMgrImpl	WARNI	WSVR0626W: The ThreadPool setting on the ObjectRequestBroker service is deprecated.				
21.074	00000000	l.impl.TCPPort	SEVER	TCPC0003E: TCP Channel TCP_5 initialization failed. The socket bind failed for host * and port 9356. The port may already be in use.				
21.075	00000000	rameworkimpi	SEVER	CHFW0034W: The Transport Channel Service detected transport chain DCS failed. The service will retry to start chain DCS every 5,000				
21.078	00000000	I.impl.TCPPort	SEVER	TCPC0003E: TCP Channel TCP_5 initialization failed. The socket bind failed for host * and port 9356. The port may already be in use.				

____b. Within the **Select Export Options** window, set the log format to **Binary format** and the log content to **Current view only**. Then click **OK**.

Sele	ect log format
۲	Binary format (readable by LogViewer)
0	Basic format
0	Advanced format
Sele	ect log content
۲	Current view only
0	Whole Repository

____ c. In the File Download window, select **Save File** then click **OK**.

🕹 Opening logs_thinkCell01_thinkNode01_server2.zip 🗙
You have chosen to open
Iogs_thinkCell01_thinkNode01_server2.zip which is a: ZIP archive from: https://10.10.10.101:9043
What should Firefox do with this file?
O <u>Open with</u> Archive Manager (default) 🖨
Save File
Do this <u>automatically</u> for files like this from now on.
🗙 Cancel 🥥 OK

____ d. d. In the Save As window, select the application server profile logs directory, for example,

cd /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server2

unzip ~/Downloads/logs_thinkCell01_thinkNode01_server2.zip

	root@t	hink:/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs
<u>F</u> ile <u>E</u> dit <u>V</u> iew	<u>T</u> erminal Ta <u>b</u> s	E Help
[root@think logs Archive: logs_t creating: log inflating: log [root@think logs	s]# unzip log thinkCell01_ gs_AppSrv01C gs_AppSrv01C s]#	gs_thinkCell01_thinkNode01_server2.zip -d logs_AppSrv01Cell_AppSrv01Node_server2 thinkNode01_server2.zip ell_AppSrv01Node_server2/1317503101524_24890-server2/ ell_AppSrv01Node_server2/1317503101524_24890-server2/1317503101524.wbl

- ____ e. Make note of the new subdirectory name, that was just created, as a result of the unzip command, above. For example, looking at the unzip command above, you can see that a new subdirectory name of 1321438920534_6137-server2 was created.
- ____f. Run the logViewer command, with the –repositoryDir option, to view the log messages present in the exported repository. Note: substitute the new subdirectory name for <NEWSUBDIR> below. For example;

cd /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin

./logViewer.sh repositoryDir./logs/server2/<NEWSUBDIR>

root@think:/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin	×
Elle Edit View Terminal Tabs Help	
[root@think bin]# ./logViewer.sh -repositoryDir/logs/server2/1321438920534_6137-server2	-
********** Start Display Current Environment **********	
WebSphere Platform 8.0.0.0 [ND 8.0.0.0 nll18.03] running with process name thinkCell01\thinkNode01\server2 and process id 6137	
Host Operating System is Linux, version 2.6.18-238.12.1.el5	
Java version = 1.6.0, Java Compiler = J9)1226, Java VM name = IBM J9 VM	
was_instatt.root = /opt/IBM/websphere/AppServe/orofiles/AppSrv@l	
Java Home = /ont/IRM/webShere/AndServer/java/ire	
ws.ext.dirs = /opt/IBM/WebSphere/AppServer/iava/lib:/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/classes:/opt/IBM/WebSphere/AppServer/cl	
asses:/opt/IBM/WebSphere/AppServer/lib:/opt/IBM/WebSphere/AppServer/installedChannels:/opt/IBM/WebSphere/AppServer/lib/ext:/opt/IBM/WebSph	
ere/AppServer/web/help:/opt/IBM/WebSphere/AppServer/deploytool/itp/plugins/com.ibm.etools.ejbdeploy/runtime	
Classpath = /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/properties:/opt/IBM/WebSphere/AppServer/properties:/opt/IBM/WebSphere/AppServer/	
/lib/startup.jar:/opt/IBM/WebSphere/AppServer/lib/bootstrap.jar:/opt/IBM/WebSphere/AppServer/lib/jsf-nls.jar:/opt/IBM/WebSphere/AppServer/	
lib/lmproxy.jar:/opt/IBM/WebSphere/AppServer/lib/urlprotocols.jar:/opt/IBM/WebSphere/AppServer/deploytool/itp/batchboot.jar:/opt/IBM/WebSp	
here/AppServer/deploytool/itp/batch2.jar:/opt/IBM/WebSphere/AppServer/java/lib/tools.jar	
Java Library path = /opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native/LihuX/x86_32/:/opt/18//websphere/Appserver/Lib/native	
ebsphere/Appserver/Java/Jre/CLD/IS80/delaut://df/IBM/Websphere/Appserver/Java/Jre/CLD/IS80:/df//IBM/Websphere/Appserver/CLD/IS80:/df//Appserver/CLD/IS80:/df//BM/Websphere/Appserver/CLD/IS80:/df//A	
Add_227.7007/1007/medspinete/Appsetver/2011.0037/100.	
************* End Disolay Current Environment ***********	
[11/16/11 5:22:00:534 EST] 00000000 WSKeyStore W CWPKI0041W: One or more key stores are using the default password.	
[11/16/11 5:22:03:377 EST] 00000000 ThreadPoolMgr W WSVR0626W: The ThreadPool setting on the ObjectRequestBroker service is deprecated.	
[11/16/11 5:22:27:547 EST] 00000014 container W org.apache.aries.jpa.container.impl.PersistenceBundleHelper findPersistenceXmlFiles Th	
e bundle com.ibm.example.banking.web_1.0.0.201110071327 specified the Meta-Persistence header. However, no persistence descriptors could b	
e located. The following locations were searched: [WEB-INF/classes/META-INF/persistence.xml]	
[11/16/11 5:22:27:559 EST] 000000014 container W org.apache.aries.jpa.container.impl.PersistenceBundleHelper findPersistenceXmlFiles Th	
e bundle com ibm.example.banking.web_i.0.0.201100/132/ specified the Meta-Persistence neader. However, no persistence descriptors could b	
e tocated, ne following tocations were searched; [wEB-INF/Classes/meta-inF/persistence.xml] [11/16/15/22:77778/EST1 00000014 container	
a bundle com the example backing wohl a G 2011067137 specified the Mote Person and France Resistence bundle resistence describer of a contract of the second s	
e located. The following inclusion were searched: [WEB-INF/classes/META-INF/persistence.xml]	
(11/16/11 5:22:28:652 EST) 00000014 container Word apache.aries.ipa.container.impl.PersistenceBundleHelper findPersistenceXmlFiles Th	
e bundle com.ibm.example.banking.web 1.0.0.201110071327 specified the Meta-Persistence header. However, no persistence descriptors could b	
e located. The following locations were searched: [WEB-INF/classes/META-INF/persistence.xml]	
Operation Complete	
Processed 6 records in 0.03 seconds (200 records per second).	
[root@think bin]#	
1	1

___7. Return to the administrative console. Then click **Reset**, followed by **Apply** to remove all filtering.

View Contents	Filtering
System out	Wild cards: *,?,% are allowed
System err	Separate multiple entries by a ':'
 Logs and trace 	Include loggers:
Minimum level:	Exclude loggers:
•	Message contents:
Maximum level	
•	Event Timing
	From: On:
Apply Reset	Until: On:

- 8. Log out of the administrative console.9. This completes the lab.

Appendix A. Common Tasks

Below are some common tasks that you may need to perform several times during this lab

1. Starting a WAS (standalone) application server ./startServer <servername>
 e.g from the /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin directory

./startServer server1

_____ 10.Stopping a WAS (standalone) application server ./stopServer <servername>

e.g from the /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin directory

./stopServer server1

_____ 11.Starting a WAS-ND Node Agent startNode

e.g from the /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin directory

startNode

_____12.Stopping WAS-ND Node Agent stopNode

e.g from the /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin directory

stopNode

_____13.Starting a WAS-ND Deployment Manager startManager

e.g from the /opt/IBM/WebSphere/AppServer/profiles/Dmgr01/bin directory

startManager

- _____14.Starting a WAS-ND Deployment Manager stopManager
 - e.g from the /opt/IBM/WebSphere/AppServer/profiles/Dmgr01/bin directory

stopManager

____ 15.Mounting CDs in VMware

_____t. As shown below navigate to VM -> Removable Devices -> CD-ROM (IDE1:0) -> Edit

	VM Team Windows Help		
	Power		
-	Removable Devices	Audio (Auto detect)	
1	Casadat	CD-ROM (IDE 1:0) Connect	
I	Replay	Ethernet Edit	
	Clone	USB Devices	
	Install VMware Tools	A CONTRACTOR AND A CONTRACTOR	ł

- _ c. As shown below in In the CD-ROM (IDE:1.0) panel
 - 1) Click Browse
 - 2) Select the ISO image desired
 - 3) Click Open
 - 4) Check Connected
 - 5) Click OK



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