Deploying an application on a cluster

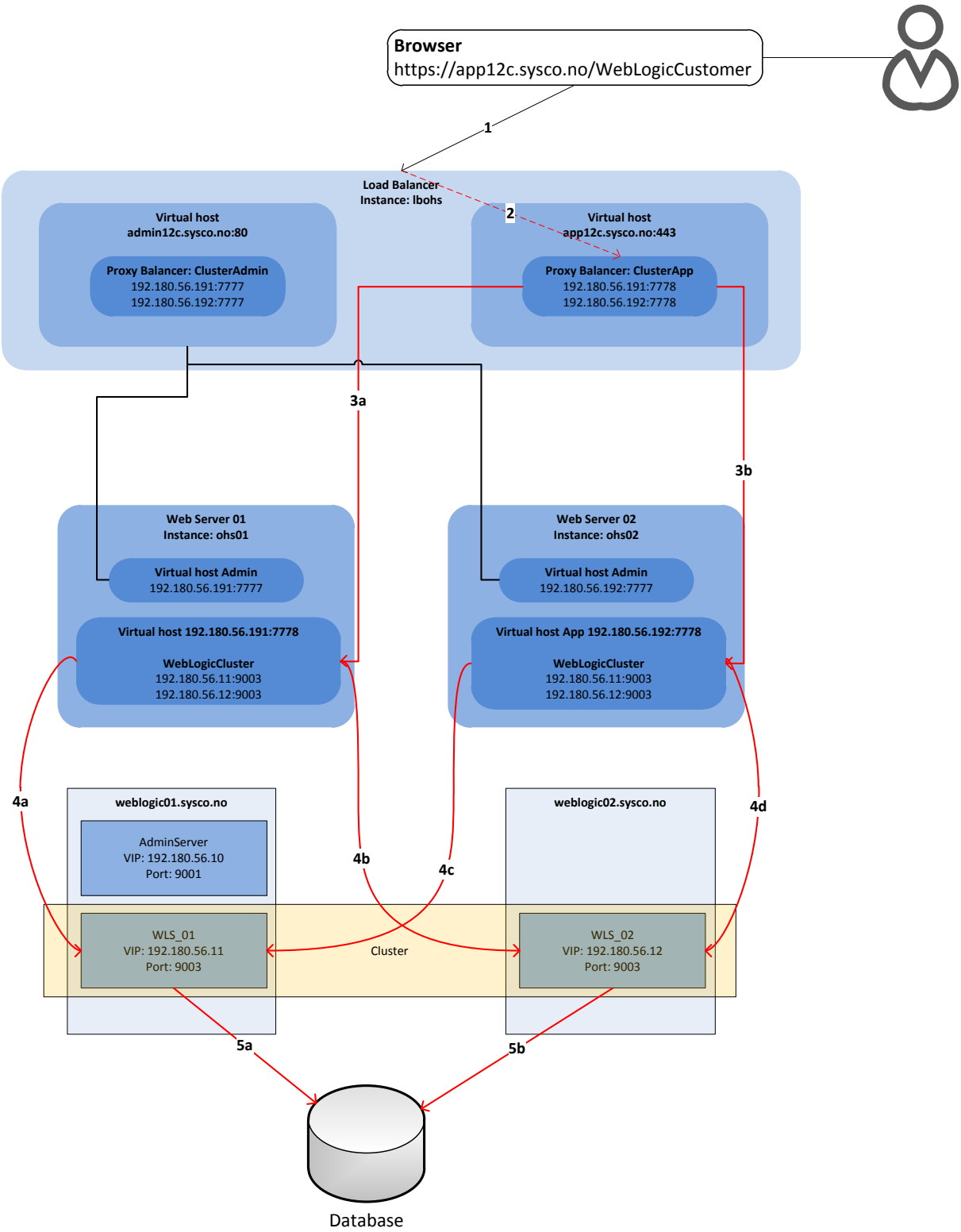
The aim of this post is to show how to deploy an application on the cluster created in [1]. Thus, the following sections will show how to create a sample application, the configuration of the HTTP Server to make the application available and the deployment on the cluster using one of the shared storages created on [1].

1. **Generating a sample application**

   In order to generate an application the steps stated in [2] are followed. However, it is important to say that in this post an Oracle database is used. After following these steps, this application is created: **WebLogicCustomer**, this application will use a data source called **"jdbc/mysql-sample"** in order to access to the Oracle database.

2. **The request flow**

   The following picture describes the flow of a request on the architecture created in [1].



This flow depicted in the previous picture is composed by the following steps

a. User requests the application using this URL:

https://app12c.sysco.no/WebLogicCustomer

It is important to remember that in [1] the use of https on the web layer was configured with demo certificates.

b. The OHS load balancer recognizes the request that is sent to one of its virtual hosts. In this case **app12c.sysco.no:443**

c. We have two possibilities called 3a and 3b, the first one will direct the traffic to the instance **ohs01** and the second to the instance **ohs02**.

d. Here we have two possibilities for each OHS. We have 4a and 4b to direct the traffic from the cluster definition within the virtual host configured on the instance **ohs01** to the managed servers **WLS_01** or **WLS_02**. In addition, we have 4c and 4d to do the same as 4a and 4b, but from the instance **ohs02** to the managed servers **WLS_01** or **WLS_02**.

e. In this case we have 5a that represents the traffic from the managed server **WLS_01** to the database. In addition, we have 5b that represents the same, but from **WLS_02** to the database

Therefore, a possible path for an application request is: **1-2-3b-4c-5a**.

After analysing the previous picture it is possible to detect that it is necessary to configure the cluster definition on the Oracle HTTP Server since when the architecture was created in [1] no applications were deployed. The following section will show how to do it.

3. Configuring the cluster on the Oracle HTTP Server.

In [1] Oracle HTTP Server is used in two important components, the first one works as a load balancer and the second works as la web layer. The cluster configuration will be done on the second one. These are the steps.

a. In [1] the file appVhost.conf was created in this folder:

```
/u02/oracle/config/domains/incadomain/config/fmwconfig/components/OHS/instances/ohs01/moduleconf
```

That configuration was made on ohs01.sysco.no and ohs02.sysco.no as is shown in this picture.

```
<VirtualHost ohs01.sysco.no:7778>
 ServerName app12cVirtualHost
 ServerAdmin example@example.com
 RewriteEngine On
 RewriteOptions inherit

</VirtualHost>
~
```

b. Now that file must be modified to include the cluster definition for the new application. Thus, we will have this new version.

```
<VirtualHost ohs02.sysco.no:7778>
 ServerName app12cVirtualHost02
 ServerAdmin example@example.com
 RewriteEngine On
 RewriteOptions inherit

 <Location /WebLogicCustomer>
  SetHandler weblogic-handler
  WebLogicCluster ms01vhost.sysco.no:9003,ms02vhost.sysco.no:9003
  WLProxySSL ON
  WLProxySSLPassThrough ON
 </Location>

</VirtualHost>
```

In this new version it is possible to see the Location directive used to send the requests for the application called WebLogicCustomer. In addition, the WebLogicCluter is defined since the application will be deployed on the cluster created in [1].

c. Apply this configuration on ohs01.sysco.no and oh02.sysco.no and restart the Oracle HTTP Server on both machines.

4. Deploying the application

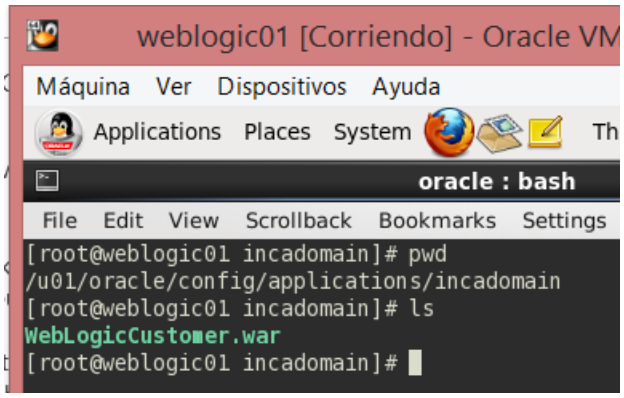
First of all it is important to remember that in [1] a shared storage, created on an Oracle ZFS simulator, was configured. Thus, the application developed in this post will be saved in the folder defined in [1]. This folder is highlighted in the following table taken from [1].

File System	MACHINE	DESCRIPTION	U	Comments
fsbinaries01	weblogic01	Products	u01	Products binary files
fsms01	weblogic01	Config	u02	Managed Server
fsbinaries02	weblogic02	Products	u01	Products binary files
fsms02	weblogic02	Config	u02	Managed Server

fsadm	weblogic01 (contingency weblogic02)	Config	u01	Administration Server
fsapp	weblogic01, weblogic02	Applications	u01	Applications developed
fsdp	weblogic01, weblogic02	Deployment plans	u01	Deployment plans
fscluster	weblogic01, weblogic02	JMS, Tlogs	u01	JMS, Tlogs

That file system was mounted on this path `/u01/oracle/config/applications/incadomain` for these hosts weblogic01.sysco.no and weblogic02.sysco.no.

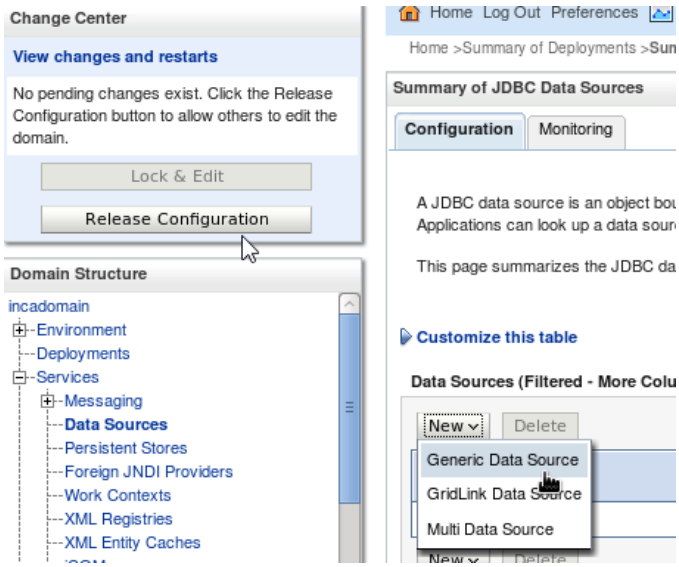
In the following picture you can see the deployment saved on that folder.



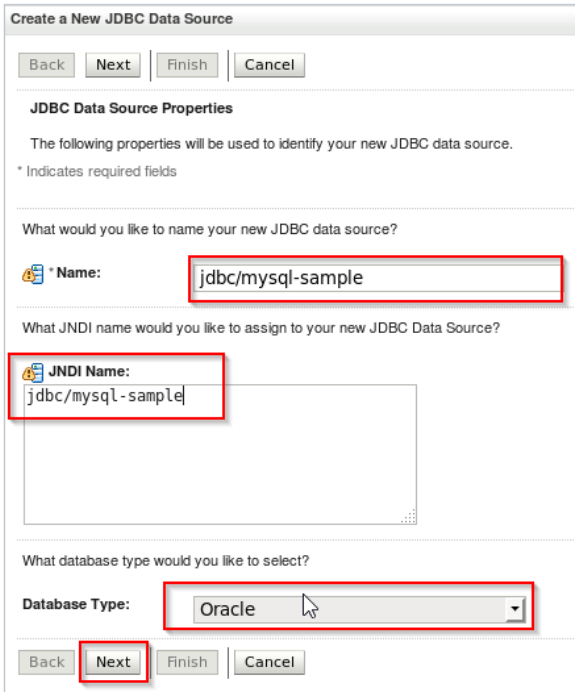
The following steps show the creation of the data source and the application deployment process

Data source creation

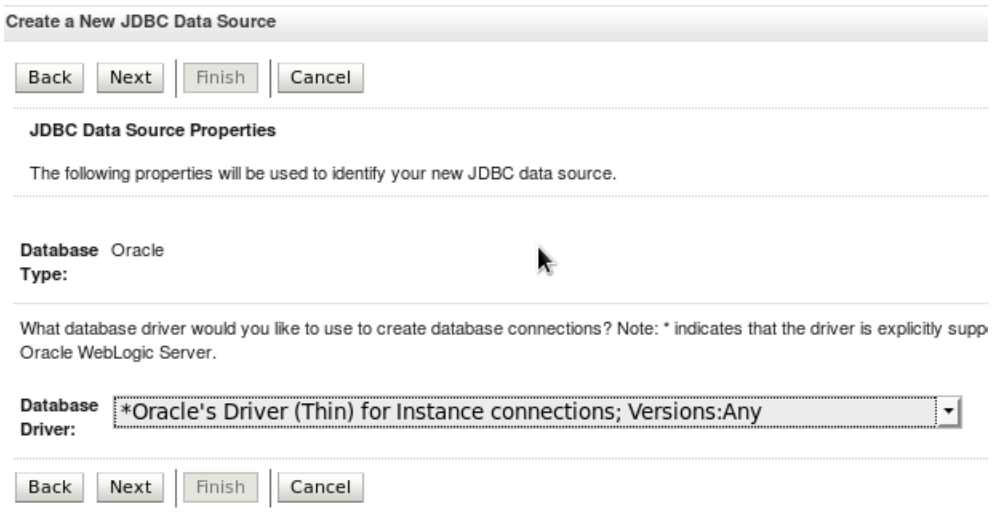
a. On the Change Center click on Lock & Edit
b. On the left panel click on Services > Data Sources
c. Click on New > Generic Data Source



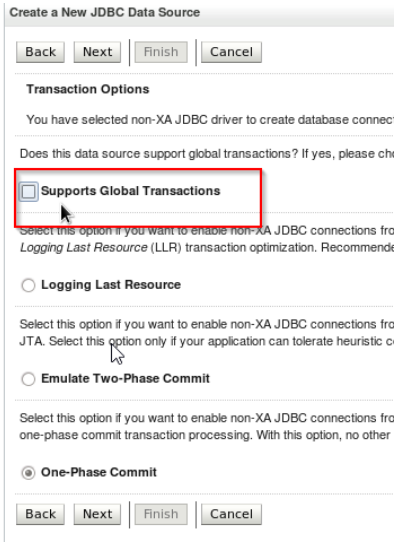
d. Fill the fields shown in the picture and click on



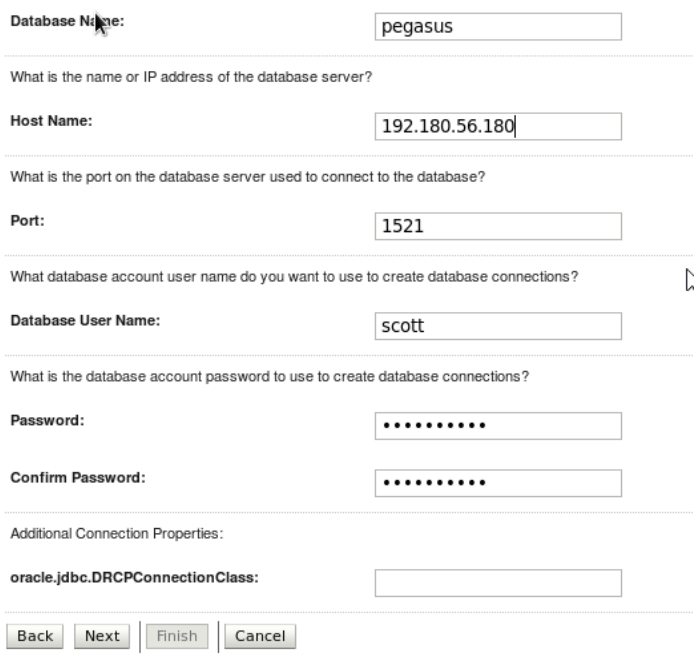
e. Select the driver and click on Next



f. Unmark the check highlighted and click on Next



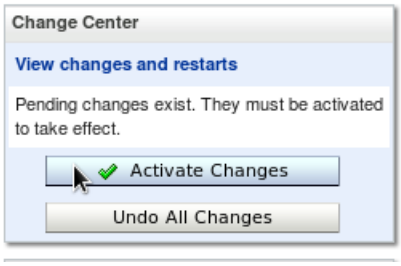
g. Fill the database information and click on Next



h. Click on Next

i. Select the whole cluster as a target for this data source and click on Finish

j. On the change center click on Activate Changes



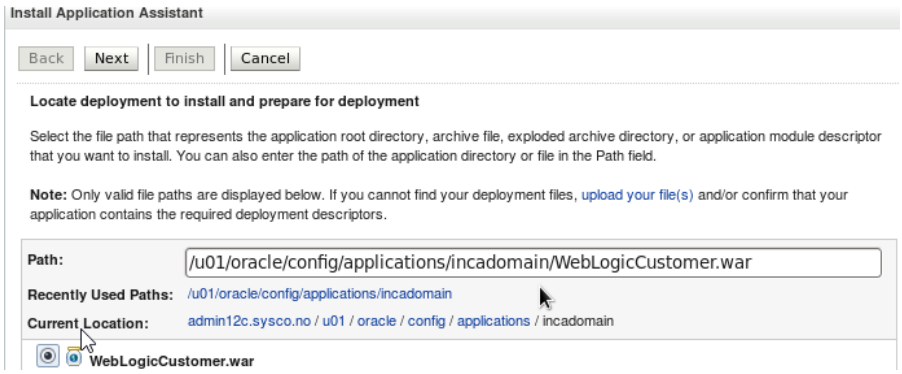
Application deployment

a. On the Change Center click on Lock & Edit

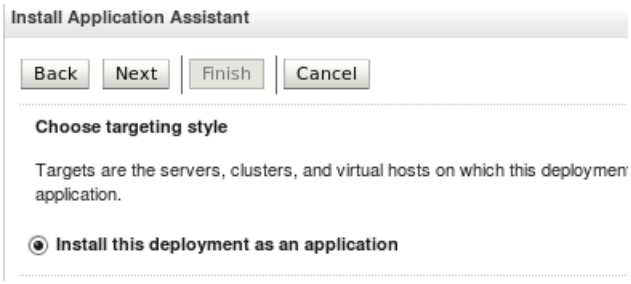
b. Click on Deployments

c. Click on Install

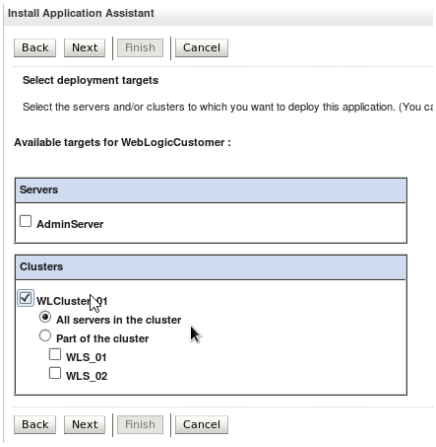
d. Specify the path defined for this architecture and mark the radio button to select the application. Click on Next



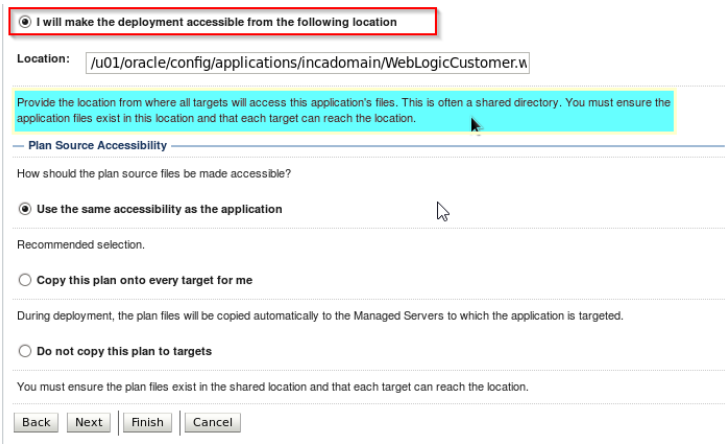
e. Left the default option and click on Next



f. Mark the whole cluster and click on Next



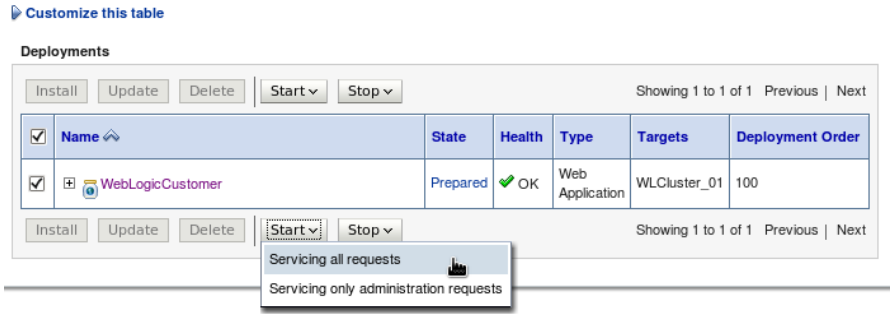
g. Select the option remarked because is the most suitable for this architecture and click on Next.



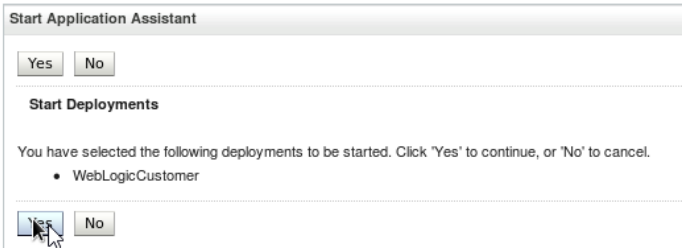
h. Click on Finish

i. On the change center click on Activate Changes

j. On the left panel go to Deployments and on the Control tab start the new deployment.

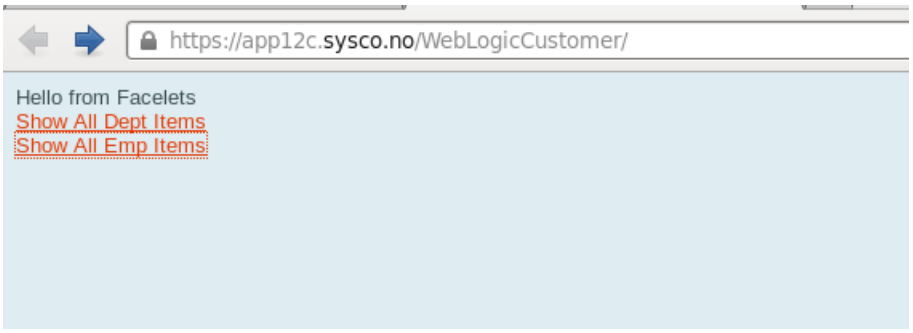


k. Click on Yes to start the application.

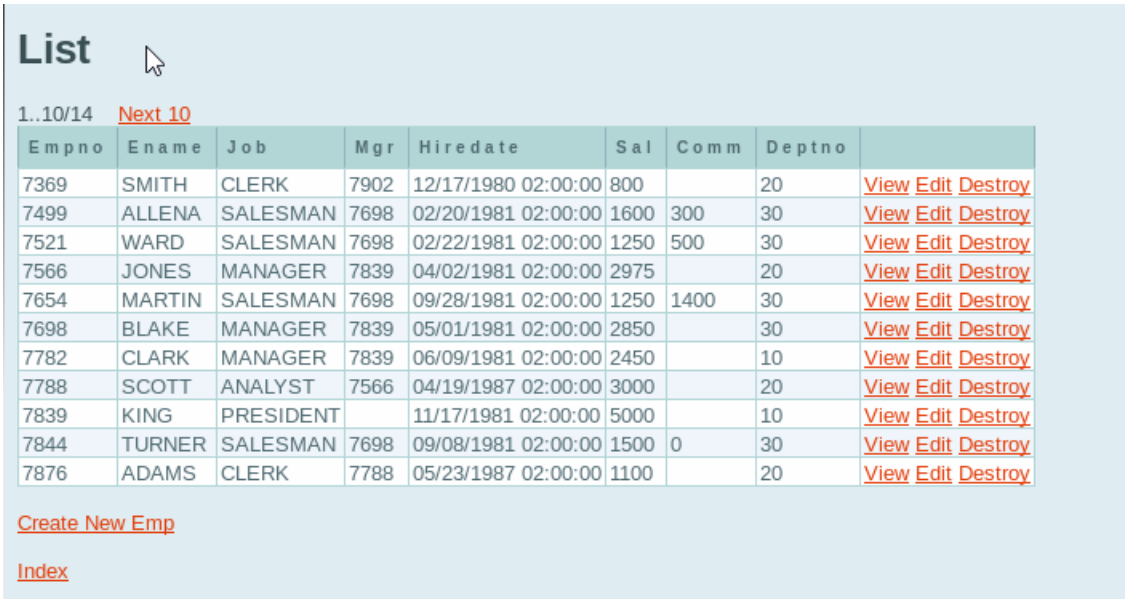


5. **Testing the application**
   Use a browser to invoke the application: https://app12c.sysco.no/WebLogicCustomer

   Click on any of the two options. For example “Show All Emp Items”



   Here you can see the result



List

1..10/14 Next 10

Empno	Ename	Job	Mgr	Hiredate	Sal	Comm	Deptno	
7369	SMITH	CLERK	7902	12/17/1980 02:00:00	800		20	View Edit Destroy
7499	ALLENA	SALESMAN	7698	02/20/1981 02:00:00	1600	300	30	View Edit Destroy
7521	WARD	SALESMAN	7698	02/22/1981 02:00:00	1250	500	30	View Edit Destroy
7566	JONES	MANAGER	7839	04/02/1981 02:00:00	2975		20	View Edit Destroy
7654	MARTIN	SALESMAN	7698	09/28/1981 02:00:00	1250	1400	30	View Edit Destroy
7698	BLAKE	MANAGER	7839	05/01/1981 02:00:00	2850		30	View Edit Destroy
7782	CLARK	MANAGER	7839	06/09/1981 02:00:00	2450		10	View Edit Destroy
7788	SCOTT	ANALYST	7566	04/19/1987 02:00:00	3000		20	View Edit Destroy
7839	KING	PRESIDENT		11/17/1981 02:00:00	5000		10	View Edit Destroy
7844	TURNER	SALESMAN	7698	09/08/1981 02:00:00	1500	0	30	View Edit Destroy
7876	ADAMS	CLERK	7788	05/23/1987 02:00:00	1100		20	View Edit Destroy

Create New Emp

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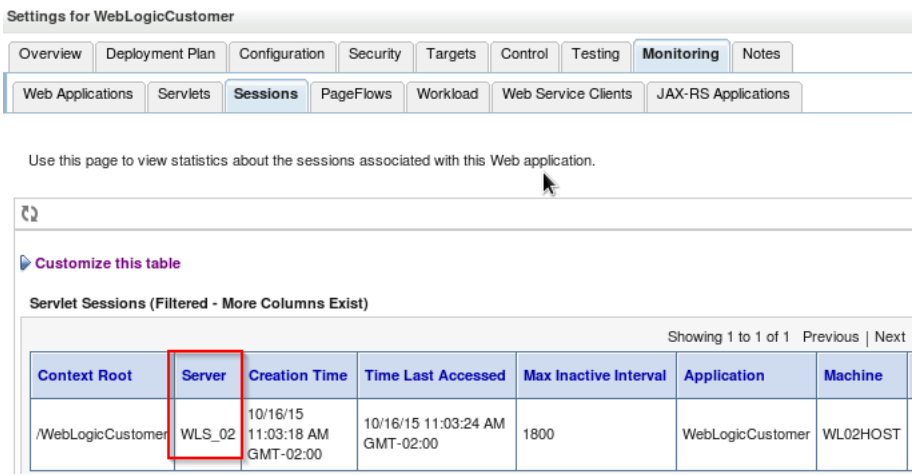
In addition, you could monitor that is happening with the application on the Admin Console. For example click on Deployments, select the deployment WebLogicCustomer, select the tab Monitoring and then the tab Sessions and you could see this table.



Settings for WebLogicCustomer

Overview | Deployment Plan | Configuration | Security | Targets | Control | Testing | Monitoring | Notes

Web Applications | Servlets | Sessions | PageFlows | Workload | Web Service Clients | JAX-RS Applications

Use this page to view statistics about the sessions associated with this Web application.

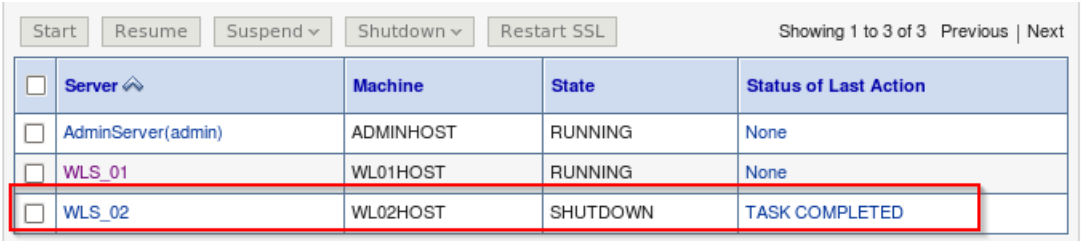
Customize this table

Servlet Sessions (Filtered - More Columns Exist)

Showing 1 to 1 of 1 Previous | Next

Context Root	Server	Creation Time	Time Last Accessed	Max Inactive Interval	Application	Machine
/WebLogicCustomer	WLS_02	10/16/15 11:03:18 AM GMT-02:00	10/16/15 11:03:24 AM GMT-02:00	1800	WebLogicCustomer	WL02HOST

In the previous picture it is possible to see the request was attended by the managed server WLS_02. Now, that server will be shutdown to show how the application will continue working without problems.

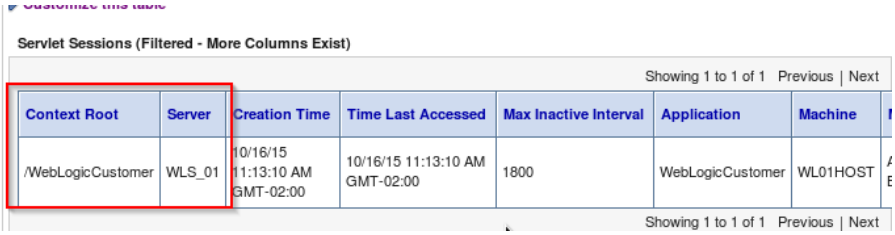


Start | Resume | Suspend | Shutdown | Restart SSL

Showing 1 to 3 of 3 Previous | Next

Server	Machine	State	Status of Last Action
AdminServer(admin)	ADMINHOST	RUNNING	None
WLS_01	WL01HOST	RUNNING	None
WLS_02	WL02HOST	SHUTDOWN	TASK COMPLETED

Now the request is attended by the other cluster member WLS_01 as can be seen in the following picture.


Servlet Sessions (Filtered - More Columns Exist)

Showing 1 to 1 of 1 Previous | Next

Context Root	Server	Creation Time	Time Last Accessed	Max Inactive Interval	Application	Machine
/WebLogicCustomer	WLS_01	10/16/15 11:13:10 AM GMT-02:00	10/16/15 11:13:10 AM GMT-02:00	1800	WebLogicCustomer	WL01HOST

Showing 1 to 1 of 1 Previous | Next

6. Conclusion

This document complement the article created in [1] since it uses the high available architecture created in that post to demonstrate how to deploy an application using a cluster. In addition, the web layer configuration to redirect requests towards the cluster is also included. Furthermore, the file system defined to store applications is used

Last but not least, the post shows how the cluster manages the shutdown of one of their members without any problems.

Beyond the capabilities of the product. This post also shows the relevance of designing an architecture based on high availability since the very beginning. Since this deployment was made based on the post created in [1], the relevance of documenting all the information related to the architecture is remarked clearly.

References list

[1] Castillo Raul (2015) Implementing a Weblogic Architecture with High Availability [Online document] Available from: http://blog.sysco.no/files/guides/VirtualEnvironmentV2.1.pdf (Accessed: October 12th 2015)

[2] NetBeans (n.d.) Developing an Enterprise Application for Oracle WebLogic Server [Online document] Available from: https://netbeans.org/kb/docs/web/jsf-jpa-weblogic.html (Accessed: October 15th 2015)