Install Clustered Oracle SOA Suite 11g

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16 February 2010

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Introduction

This document describes how to install and configure a clustered environment for the SOA suite. The clustered environment is based on:

- Two servers;
  - 4 GB internal memory
  - At least 2 CPU/Cores
  - Linux operating system
- Each server contains;
  - 2 managed servers; soa_server and bam_server
  - 1 cluster definition, soa_cluster containing the soa_server
  - 1 admin server; only on is active
- A shared storage
  - Weblogic Server binaries
  - SOA Suite binaries
  - Configuration files
- A database
  - Oracle Database, v10.2 or higher

This document is created based on the following references

- Oracle Fusion Middleware Requirements
- Oracle Fusion Middleware Certification
- Oracle SOA Suite 11g: How To Create All In One AdminServer
- Oracle Fusion Middleware Enterprise Deployment Guide; Chapter 4 & 5

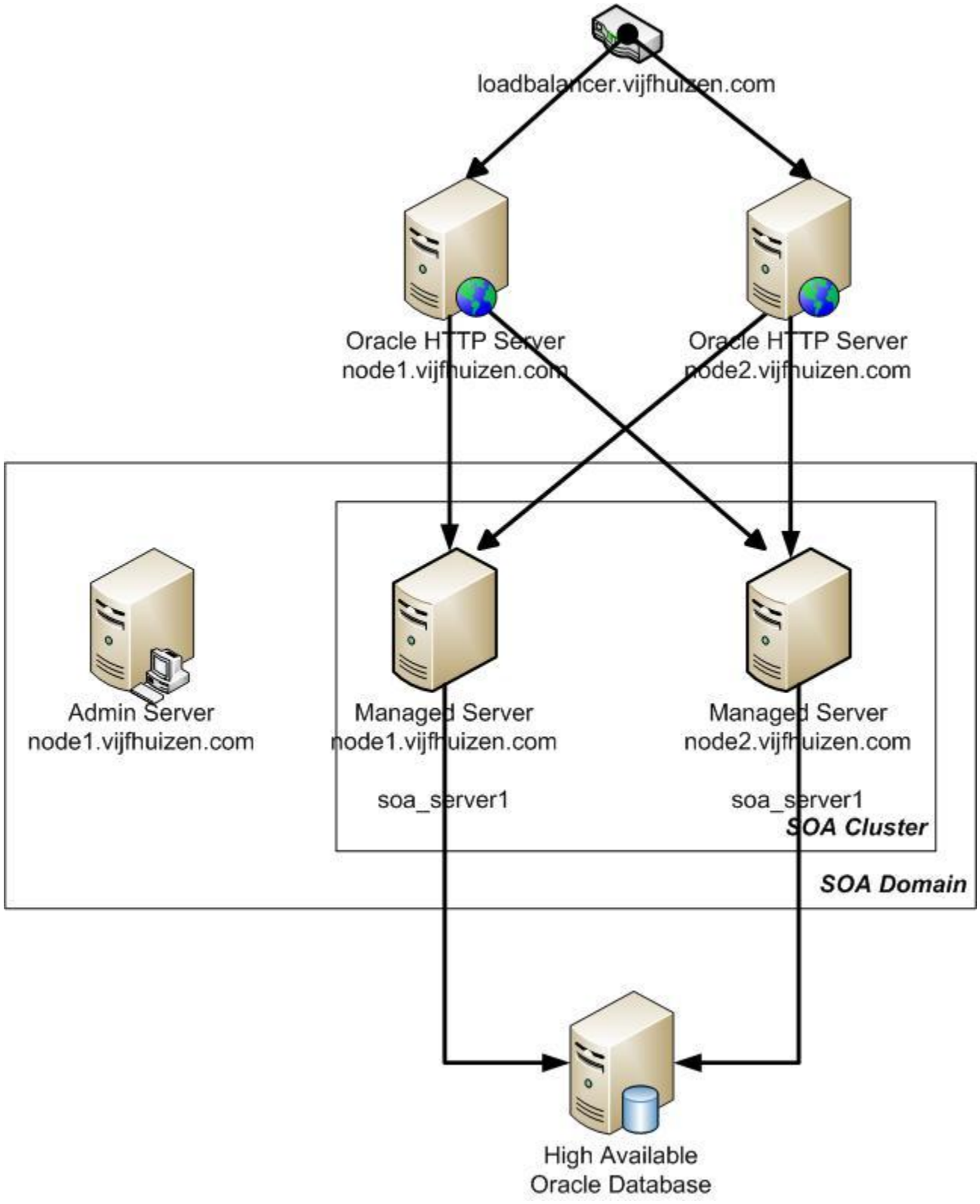
The software can be obtained from

http://www.oracle.com/technology/software/products/middleware/htdocs/fmw_11_download.html

- Oracle Weblogic Server 11g (v10.3.2)
- Oracle SOA Suite 11g (v11.1.1.2.0)
- Oracle Web Tier Utilities (11.1.1.2.0)
- Oracle Repository Creation Utility (11.1.1.2.0)

Environment Setup

The following environment is being installed:



Prerequisites:

We assume that the following software is installed but not configured.

- Oracle Weblogic Server 11g
- Oracle SOA Suite 11g

An Oracle database is up and running and loaded with the SOA repository based on the Oracle Repository Creation Utility.

The document will use the following environmental variables that is used to point to particular directories.

Name	Value	Description
WLS_HOME	/app/oracle/products/11g/fmw	Install directory of Oracle middleware binaries
WLS_SERVER	/app/oracle/products/11g/fmw/wlserver_10.3	Install directory of Oracle Weblogic server
WLS_DOMAIN	/app/oracle/products/11g/admin/domains	The directory of the domain configuration
SOA_DOMAIN	/app/oracle/products/11g/admin/domains/soadomain	The directory of the SOA domain configuration
BAM_DOMAIN	/app/oracle/products/11g/admin/domains/bamdomain	The directory of the BAM domain configuration
ORACLE_HOME	/app/oracle/products/11g/fmw/Oracle_SOA	The directory of the SOA binaries
JAVA_HOME	/user/java/jdk1.6.0_17	The java6 home directory

```
export WLS_HOME=/app/oracle/products/11g/fmw
export WLS_SERVER=/app/oracle/products/11g/fmw/wlserver_10.3
export WLS_DOMAIN=/app/oracle/products/11g/admin/domains/
export SOA_DOMAIN=/app/oracle/products/11g/admin/domains/soadomain
export BAM_DOMAIN=/app/oracle/products/11g/admin/domains/bamdomain
export ORACLE_HOME=/app/oracle/products/11g/fmw/Oracle_SOA
export JAVA_HOME=/usr/java/jdk1.6.0_17
```

Install Approach

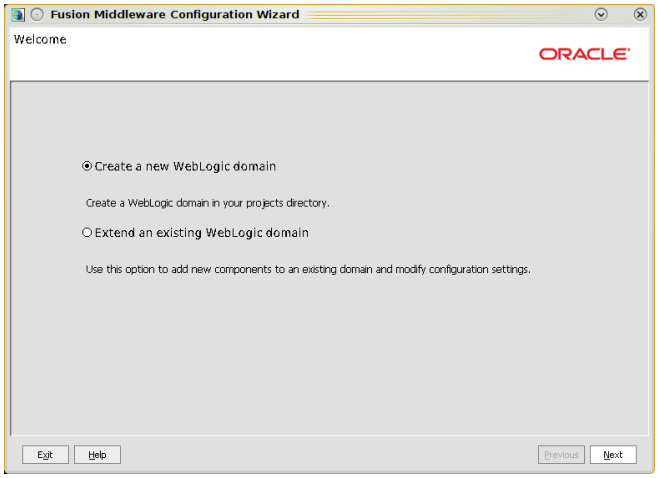
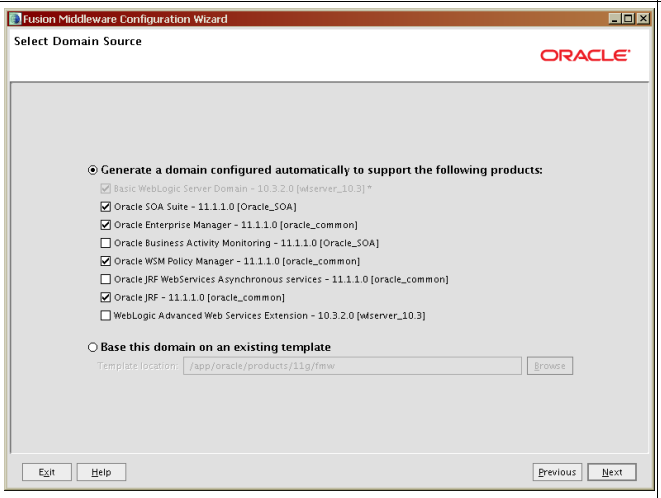
To install the SOA Cluster the following steps are executed.

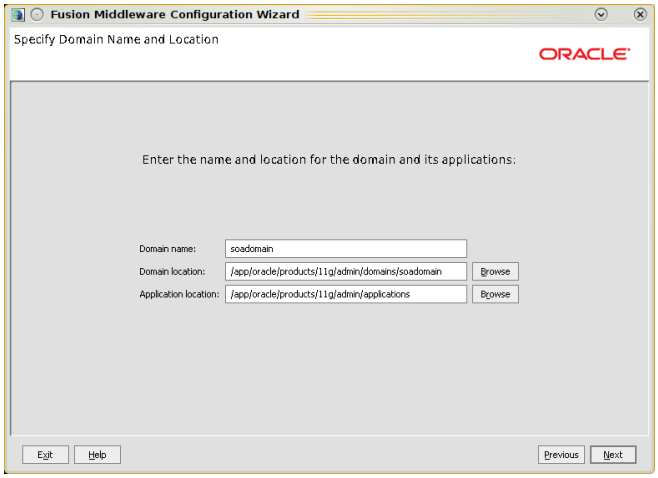
- Configure Weblogic SOA cluster
  - Select Applications
  - Define servers
  - Define cluster
  - Define datasources
- Configure SOA Cluster specific settings
  - Define Object Cache
  - Create Distributed JMS Queues
  - Define Oracle Coherence settings
- Start and test SOA cluster

Configure SOA Domain

Start the SOA 11g configuration wizard.

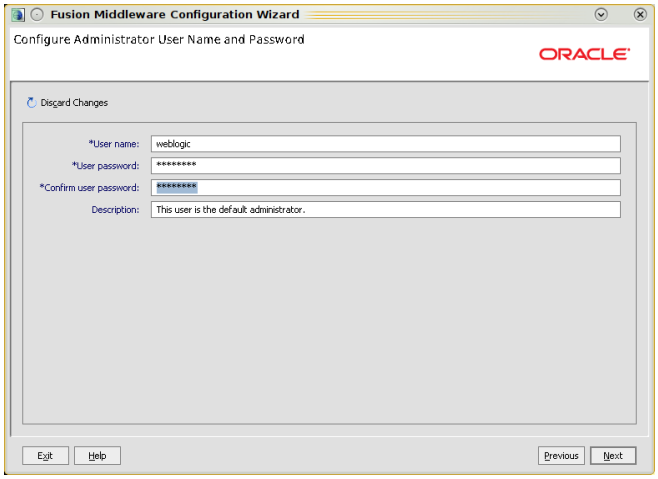
```
cd $ORACLE_HOME/common/bin
export DISPLAY=:0.0
./config.sh
```

	Click Next
	Select • SOA Suite • Enterprise Manager • WSM Policy manager • JRF Click Next



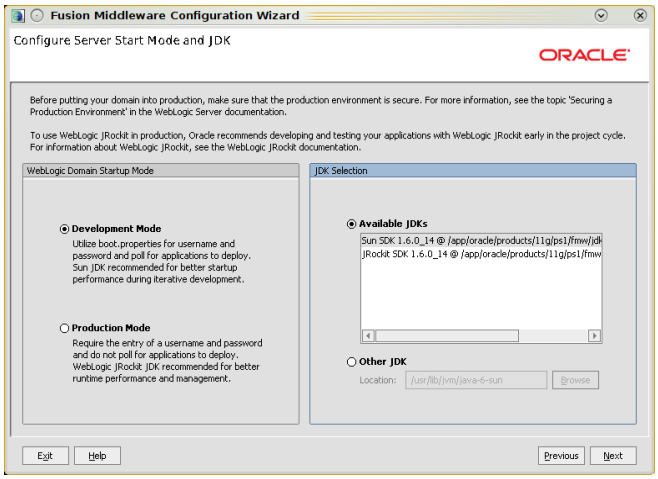
Domain name: soadomain
Domain location: /app/oracle/products/11g/admin/domains
Application location: /app/oracle/products/11g/admin/applications

Click Next



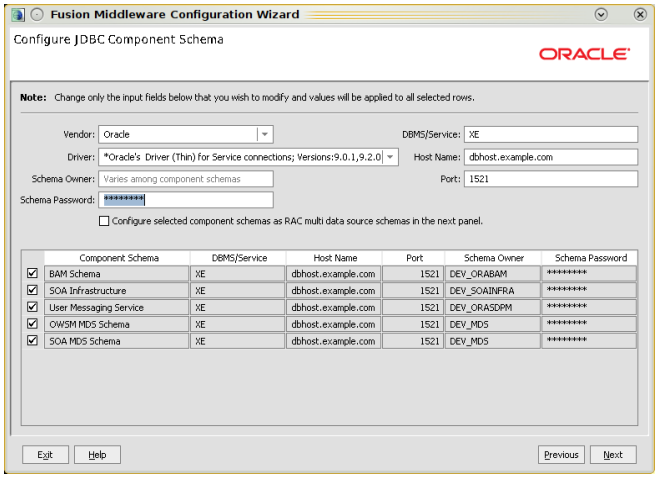
User name: weblogic
User password: welcome1
Confirm password: welcome1

Click Next



Choose your startup mode
Choose your type of JDK

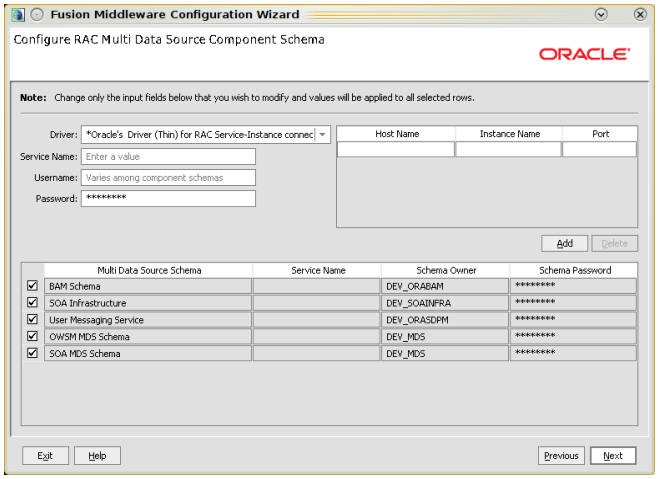
Click Next



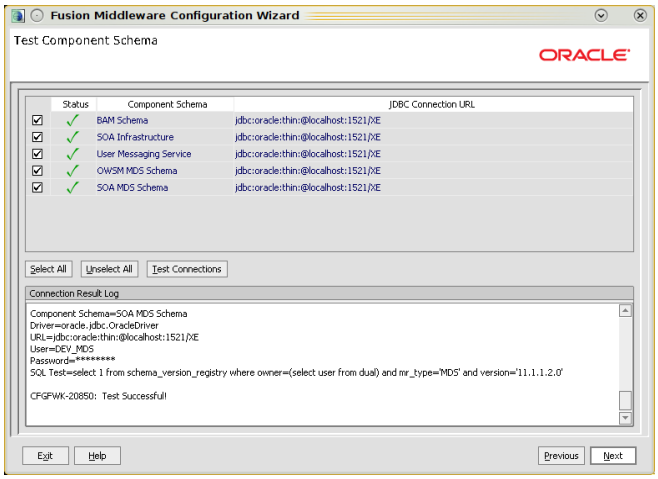
Choose the correct schema names and password for the database schemas.

Click Next

Note: if RAC is used, check the 'RAC Datasources checkbox'

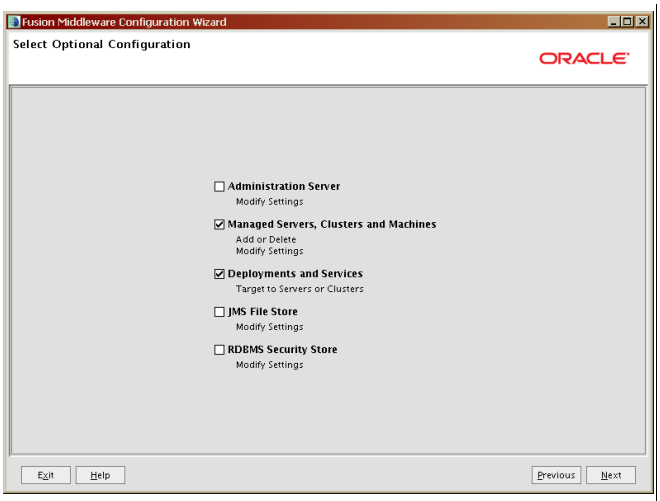


The RAC data sources configuration screen



Verification of the database connections. If this is failing, apply the correct settings.

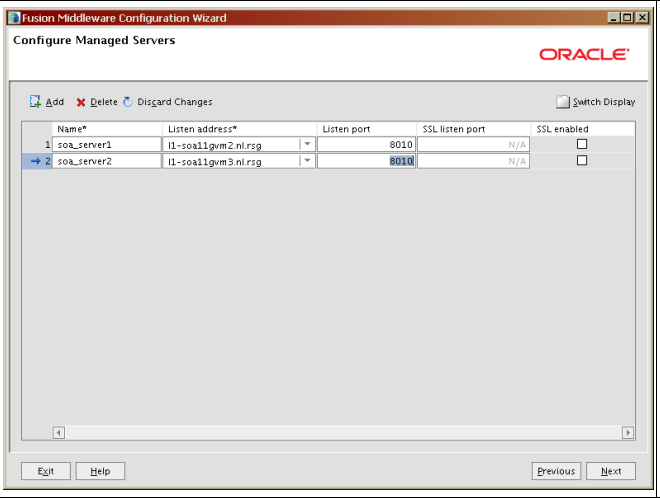
Click Next



Check:

Managed Servers, Clusters and Machines
Deployments and Services

Click Next

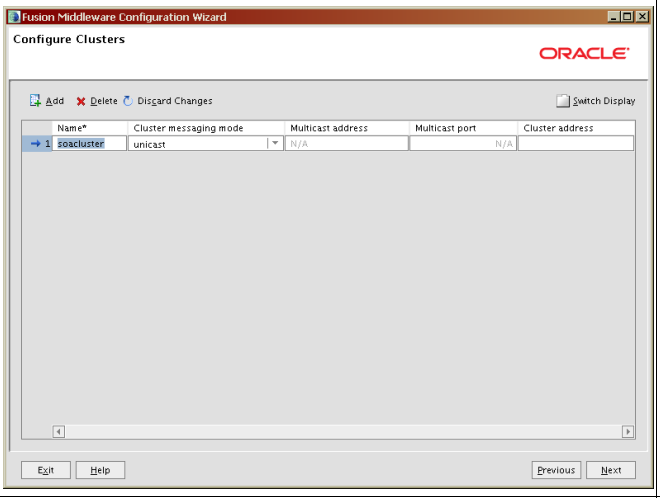


Verify that there are two servers for SOA.

Name: soa_server1
Listen: node1.vijfhuizen.com
Port: 8010

Name: soa_server2
Listen: node1.vijfhuizen.com
Port: 8010

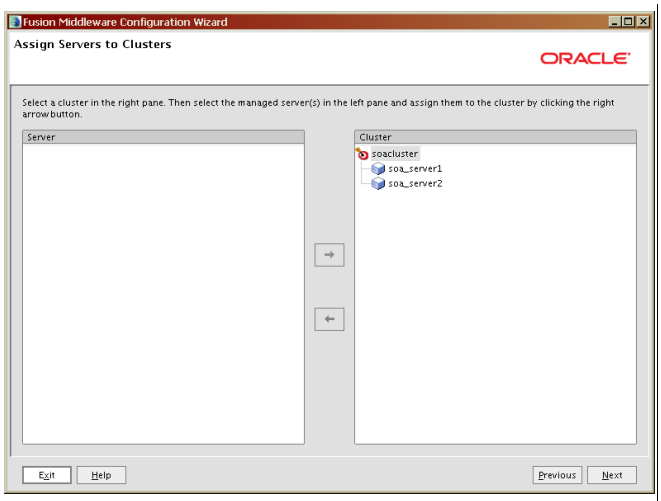
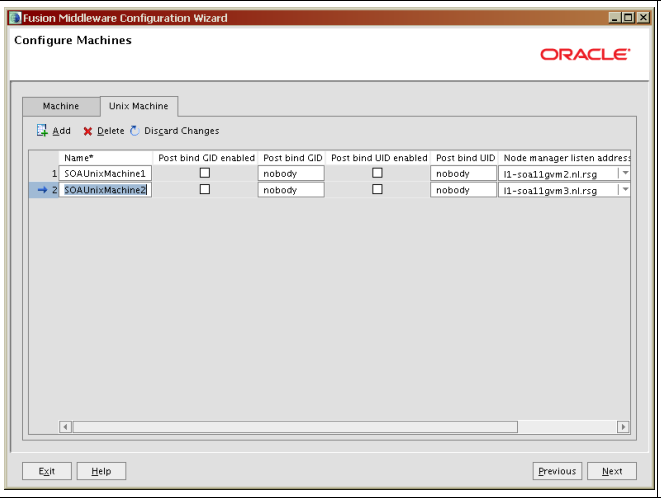
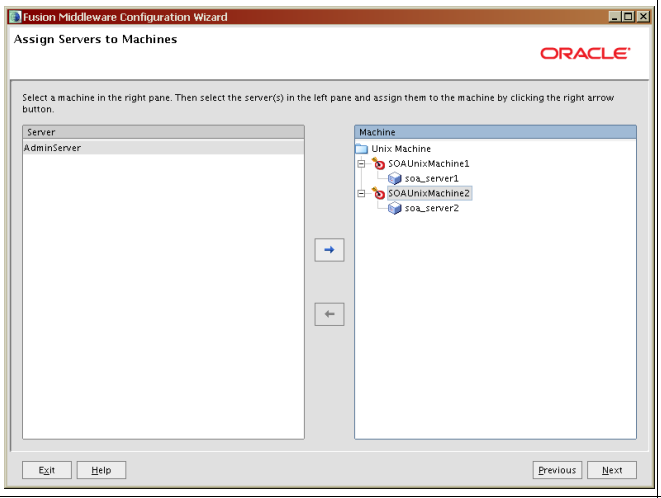
Click Next

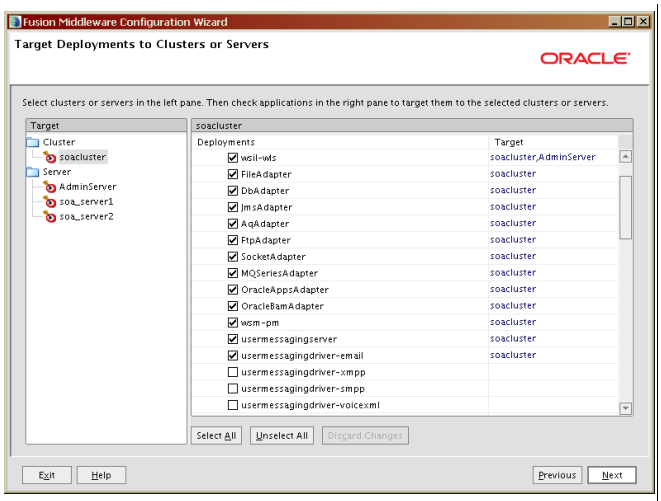


Name: soacluster

Click Next

Note: You could create a second clusters, for example, bam_cluster to seperate soa & bam.

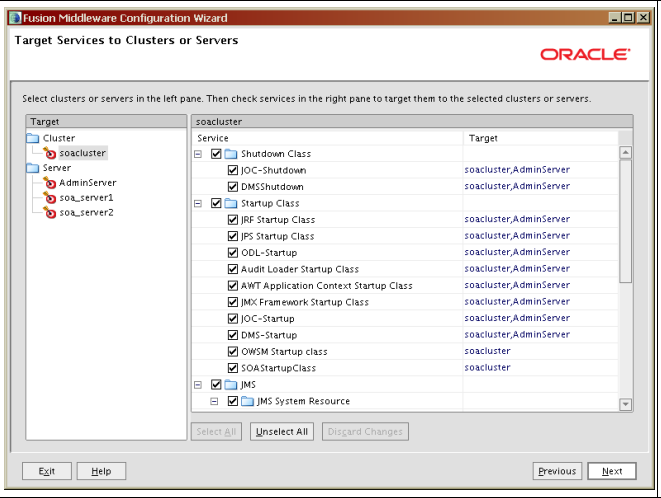
	Add all the servers to the cluster Click Next
	Remove default machine *Add all the machines that are needed in the cluster when they are maintained with node manager.* SOAUnixMachine1 | node1.vijfhuizen.com SOAUnixMachine2 | node1.vijfhuizen.com Click Next
	Add the servers to the machines. Machine 1 - soa_server1 Machine 2 - soa_server2 Click Next



This is the tricky part.

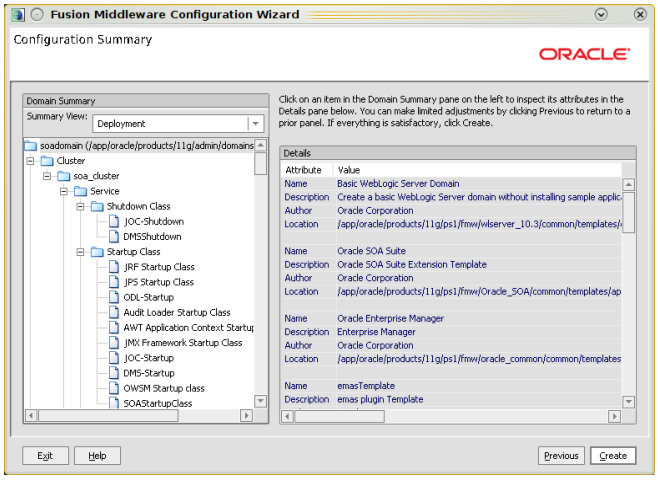
Make sure that the correct applications and libraries are targeted to the correct cluster.

Click Next



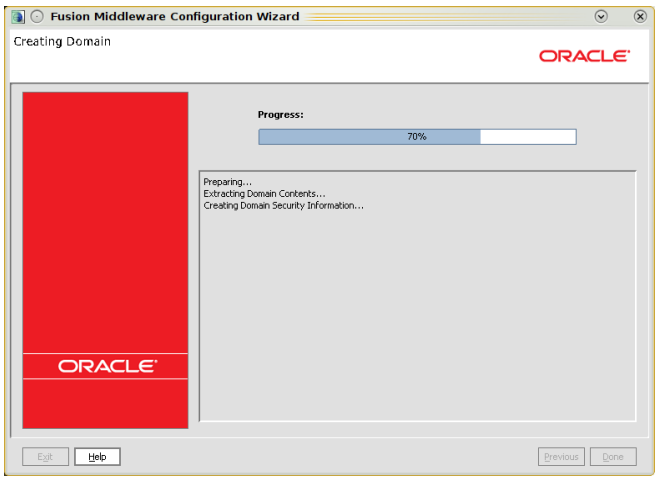
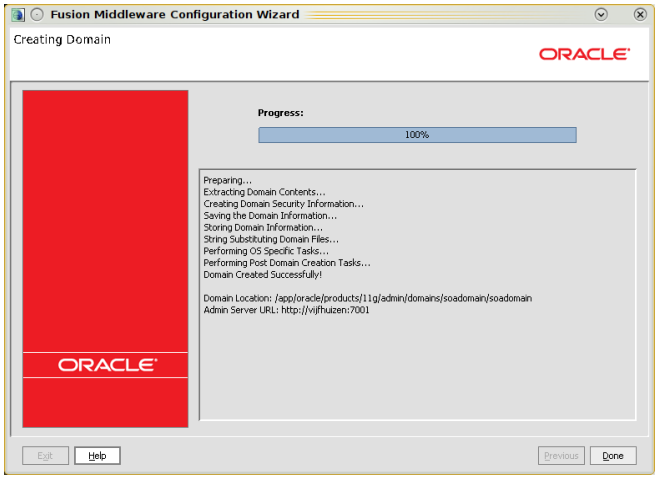
All the libraries targeted to cluster

Click Next



Summary Screen

Click Create

	Creation in progress...
	Click Done

Now we have created a 'soadomain' with a 'soacluster', the configuration should be copied to the other server. Use the pack and unpack commands to separate the domain directory used by the Administration Server from the domain directory used by the managed server in the other node.

Execute the pack command on node #1 to create a pack file with the domain definition.

```
cd $WLS_SERVER/common/bin
./pack.sh -managed=true -domain=$SOA_DOMAIN -template=soadomaintemplate.jar -
template_name=soa_domain_template
<< read domain from "/app/oracle/products/11g/admin/domains/soadomain"
>>  succeed: read domain from "/app/oracle/products/11g/admin/domains/soadomain"
<< set config option Managed to "true"
>>  succeed: set config option Managed to "true"
<< write template to
"/app/oracle/products/11g/ps1/fmw/wlserver_10.3/common/bin/soadomaintemplate.jar"
.....................................................................................
.................
>>  succeed: write template to
```

```
"/app/oracle/products/11g/ps1/fmw/wlserver_10.3/common/bin/soadomaintemplate.jar"
<< close template
>>  succeed: close template
```

Copy the ‘’ file to the other the second node. Run the unpack command on node #2 to unpack the template in the managed server domain directory as follows:

```
cd $WLS_SERVER/common/bin

scp oracle@node2.vijfhuizen.com: $WLS_SERVER/common/bin/soadomaintemplate.jar .
oracle@ node2.vijfhuizen.com's password: *****
soadomaintemplate.jar                         100% 1163KB   1.1MB/s   00:00

./unpack.sh -domain=$SOA_DOMAIN -template=soadomaintemplate.jar
<< read template from
"/app/oracle/products/11g/fmw/wlserver_10.3/common/bin/soadomaintemplate.jar"
>>  succeed: read template from
"/app/oracle/products/11g/fmw/wlserver_10.3/common/bin/soadomaintemplate.jar"
<< set config option DomainName to "soadomain"
>>  succeed: set config option DomainName to "soadomain"
<< write Domain to "/app/oracle/products/11g/admin/domains/soadomain"
.....................................................................
............
>>  succeed: write Domain to "/app/oracle/products/11g/admin/domains/soadomain"
<< close template
>>  succeed: close template
```

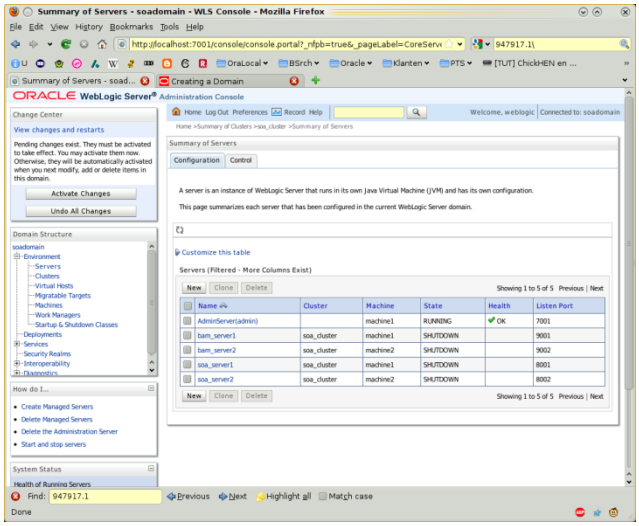
On each server, create the boot properties to start the admin server that will create the managed server based on our configuration.

```
cd $SOA_DOMAIN
vi boot.poperties
username=weblogic
passsword=welcome1

mkdir -p servers/AdminServer/security
cp boot.properties servers/AdminServer/security
```

Start the Admin Server in a new session on node #1 only.

```
cd $SOA_DOMAIN/bin
. ./startWeblogic.sh
```

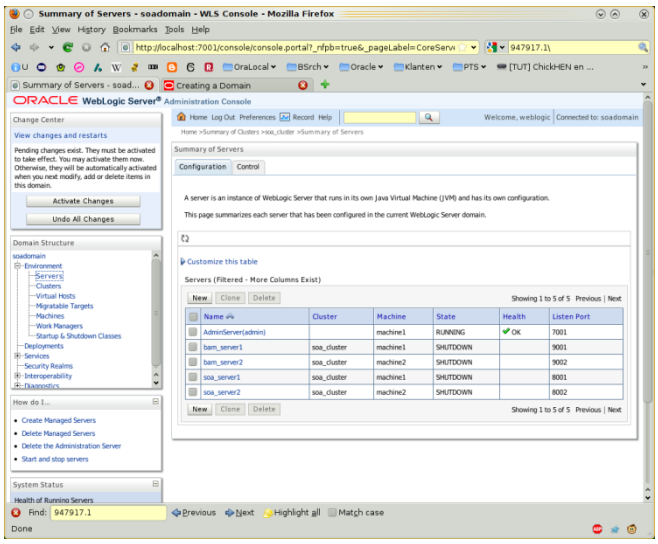
Logon to the Admin Server and verify that the managed servers are listed and assigned to a domain.



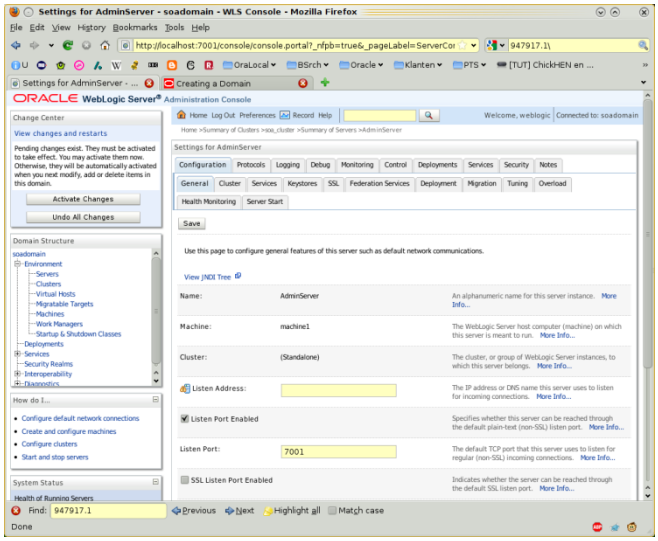
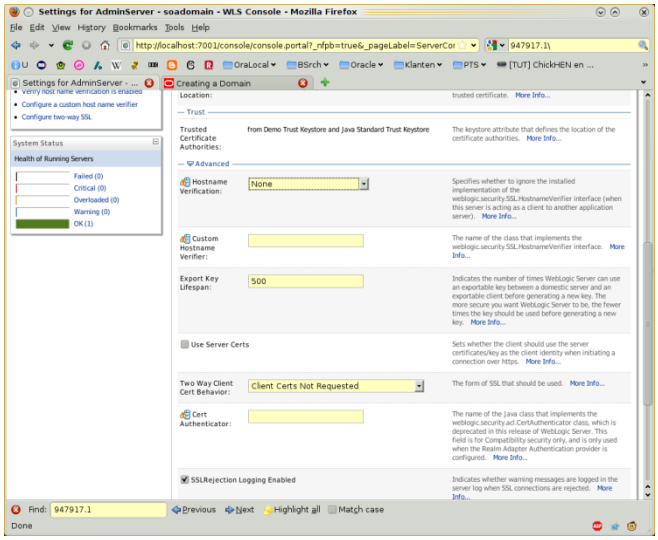
http://node1.vijfhuizen.com:7001/em

Logon as: weblogic / welcome1
Click on Environement
Click on servers

Disable hostname verification



Logon the the Admin console and click on Environment → Servers

	Select Admin Server
	Select SSL tab sheet Click on Advanced Set hostname verification to None Click on Save
Repeat these steps for all the servers	soa_server1 soa_server2

Restart the admin server to apply these settings, see Appendix.

On each server, start the Node managers, to create the initial property file. Stop the node manager after is has been started.

```
cd $WLS_SERVER/server/bin
./startNodeManager.sh
…
<Feb 16, 2010 3:06:51 PM> <INFO> <Secure socket listener started on port 5,556>
Feb 16, 2010 3:06:51 PM weblogic.nodemanager.server.SSLListener run
INFO: Secure socket listener started on port 5,556
<Control-C>
```

Edit the node manager configuration to enable the stop and start via scripts.

```
cd $WLS_SERVER/common/nodemanager
vi nodemanager.properties
…
StartScriptEnabled=true
…
StopScriptEnabled=true
…
```

This will enable the nodemanager to use the O/S specific start and stop via the scripts.

Start the node managers on each server, see appendix.

Java Object Cache

Enable the Java Object Cache on the cluster.

Start the Admin Server, see Appendix.

```
cd $WLS_HOME/oracle_common/common/bin
./wlst.sh

wls:/offline> connect()
Please enter your username [weblogic] : <enter>
Please enter your password [welcome1] : <enter>
Please enter your server URL [t3://localhost:7001] :
Connecting to t3://localhost:7001 with userid weblogic ...
Successfully connected to Admin Server 'AdminServer' that belongs to domain 'soadomain'.

Warning: An insecure protocol was used to connect to the
server. To ensure on-the-wire security, the SSL port or
Admin port should be used instead.

wls:/soadomain/serverConfig> execfile('/app/oracle/products/11g/fmw/oracle_common/bin/configure-
joc.py')

Enter Hostnames (eg host1,host2) : node1.vijfhuizen.com,node2.vijfhuizen.com

Do you want to specify a cluster name (y/n) <y>

Enter Cluster Name : soacluster

Enter Discover Port : 9991

Enter Distribute Mode (true|false) <true> : <enter>

Do you want to exclude any server(s) from JOC configuration (y/n) <n>
*** Cluster option is specified, JOC will be configured for all the Managed Server in the Cluster
soacluster  at the port  9991
drw-   AdminServer
drw-   soa_server1
drw-   soa_server2
drw-   soa_server2

Servers for Cluster :-  soa_cluster  is :-   bam_server1,bam_server2,soa_server1,soa_server2,
[bam_server1, bam_server2, soa_server1, soa_server2]
[node1.vijfhuizen.com, node2.vijfhuizen.com]

Configuring JOC for server :-  bam_server1
Location changed to domain custom tree. This is a writable tree with No root.
```

```
For more help, use help(domainCustom)

-r--   ConfigMBean                                  true
-rw-   DiscoverList                                 java.lang.String[node1.vijfhuizen.com,
node2.vijfhuizen.com]
-rw-   DiscoverPort                                 9991
-rw-   DistributeMode                               true
…

exit()
```

Configuring Oracle Coherence for Deploying Composites

The following settings will disable the default Coherence behavior of multi broadcast. We specify specific nodes that are used for SOA cluster deployment (see http://wiki.tangosol.com/dashboard.action).

On node #1, add in the startWebLogic.sh

```
cd $SOA_DOMAIN/bin
vi startWeblogic.sh

# Call setDomainEnv here.

EXTRA_JAVA_PROPERTIES="-Dtangosol.coherence.wka1=node1.vijfhuizen.com -
Dtangosol.coherence.wka2=node2.vijfhuizen.com -Dtangosol.coherence.localhost=node1.vijfhuizen.com"

DOMAIN_HOME="/app/oracle/products/11g/admin/domains/soadomain"
```

On node #2, add in the startWebLogic.sh

```
cd $SOA_DOMAIN/bin
vi startWeblogic.sh

# Call setDomainEnv here.

EXTRA_JAVA_PROPERTIES="-Dtangosol.coherence.wka1=node2.vijfhuizen.com -
Dtangosol.coherence.wka2=node1.vijfhuizen.com -Dtangosol.coherence.localhost=node2.vijfhuizen.com"

DOMAIN_HOME="/app/oracle/products/11g/admin/domains/soadomain"
```

Configure the distributed JMS Queues.

```
cd $SOA_DOMAIN/bin
. setDomainEnv.sh
*****************************************************
** Setting up SOA specific environment...
*****************************************************
EXTRA_JAVA_PROPERTIES= -da:org.apache.xmlbeans...
…
*****************************************************
** End SOA specific environment setup
*****************************************************
```

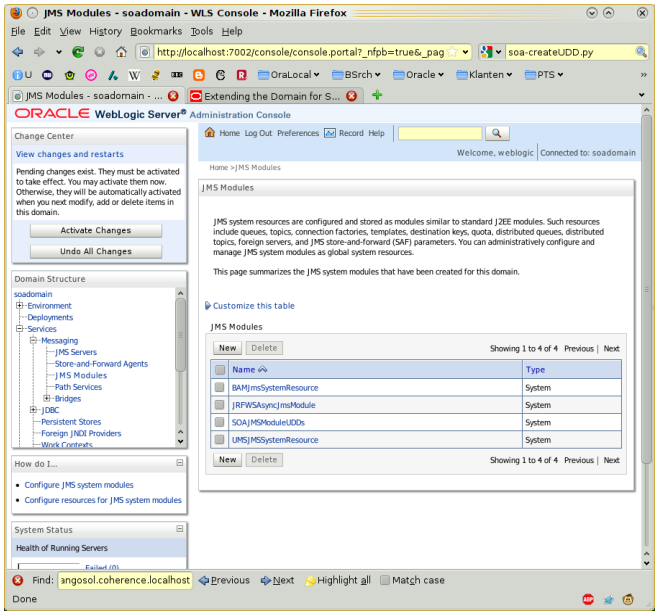
```
$JAVA_HOME/bin/java weblogic.WLST $ORACLE_HOME/bin/soa-createUDD.py --domain_home $SOA_DOMAIN --
soacluster soacluster

Initializing WebLogic Scripting Tool (WLST) ...

Welcome to WebLogic Server Administration Scripting Shell

Type help() for help on available commands


Domain Home:  /app/oracle/products/11g/admin/domains/soadomain/soadomain
SOA Cluster  :  soa_cluster
```

```
BAM Cluster  :
Track :  soa

***Deleting SOA JMS Module ***

***Creating Uniform Distributed Destination for SOA***

*** Setting Target for JMS Module***
*** Creating JMS SubModule for SOA JMS Servers***
…

searchClusterStr =  soa_cluster:
clusterNameStr =  Proxy for soa_cluster: Name=soa_cluster, Type=Cluster
UMS JMS Servers for Cluster :-  soa_cluster  is :-
UMSJMSServer_auto_1,UMSJMSServer_auto_2,UMSJMSServer_auto_3,UMSJMSServer_auto_4,
…

*** Creating Connection Factories for UMS ***
*** Enabling XA ***

*** Saving the domain ***
```

Restart the Admin server (see appendix)

Check if the following modules are listed in the console:

- SOAJMSModuleUDDs
- UMSJMSSystemResource




```
Logon to the WLS console
Expand the services
Select JMS Modules
```

Start the SOA Managed Servers, see appendix.

The cluster should be up and running.

Verify for each node if the following URL's are working.

```
http://node1.vijfhuizen.com:8010/soa-infra
http://node1.vijfhuizen.com:8010/b2bconsole
http://node1.vijfhuizen.com:8010/integration/worklistapp

http://node2.vijfhuizen.com:8010/soa-infra
http://node2.vijfhuizen.com:8010/b2bconsole
http://node2.vijfhuizen.com:8010/integration/worklistapp
```

Check in enterprise manager that the whole SOA Infra is up and running.

http://node1.vijfhuizen.com:7001/em

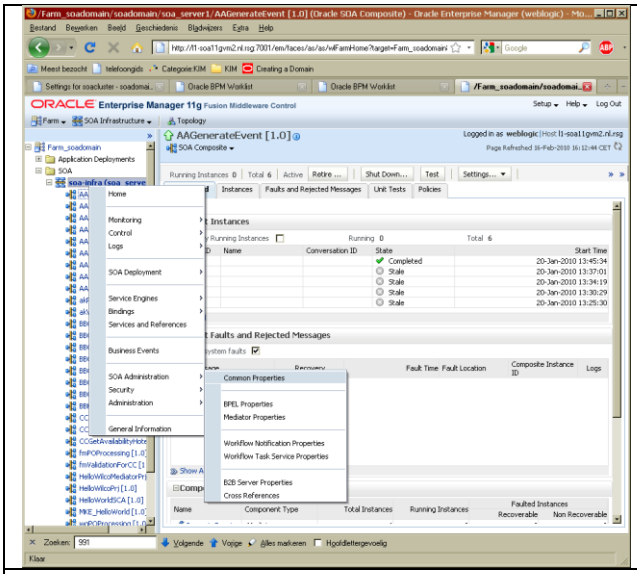
'Fake' Load Balancer.

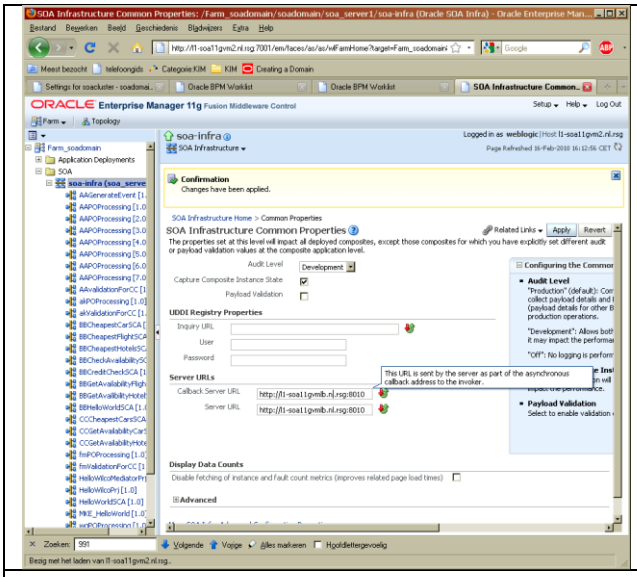
In case no load balancer is used. We can use the following approach. In each server and on the workstation the file hosts is edited. The following line is added:

```
vi /etc/hosts
Notepad C:\windows\system32\drivers\etc\hosts

10.10.10.10       loadbalancer.vijfhuizen.com
```

In the console of the enterprise manager, the SOA common properties are changed for the SOAP Url and Callback URL to:

`http://`**`loadbalancer.vijfhuizen.com`**`:8010`

	Farm_soadomain SOA Right-mouse on 'soa-infra' SOA Administration Common Properties

	Change the two URLs: Callback Server: http://**loadbalancer.vijfhuizen.com:8010** Server: http://**loadbalancer.vijfhuizen.com**:8010 Click on Apply

Appendix: Servers start stop

Stop Admin Server

In a new session:

```
$SOA_DOMAIN/bin/stopWebLogic.sh
```

Start Admin Server

In a new session:

```
$SOA_DOMAIN/bin/startWebLogic.sh
```

Or, unattended:

```
nohup $SOA_DOMAIN/bin/startWebLogic.sh &
```

Start NodeManager

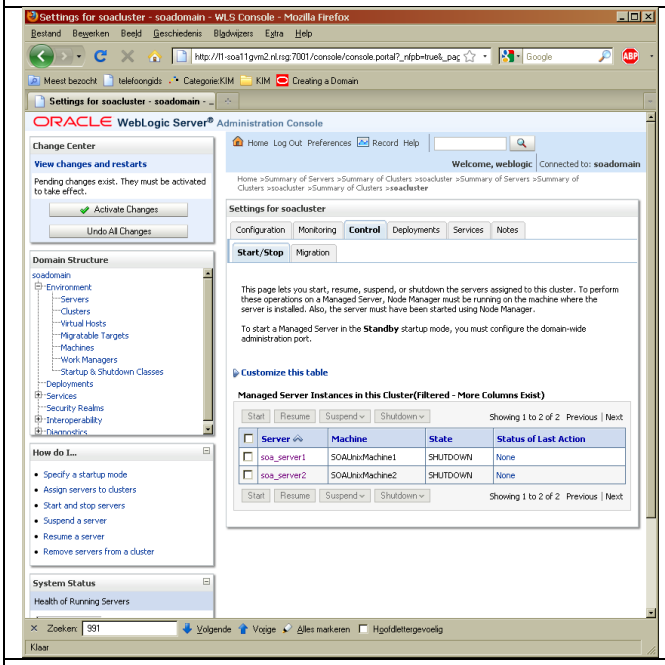
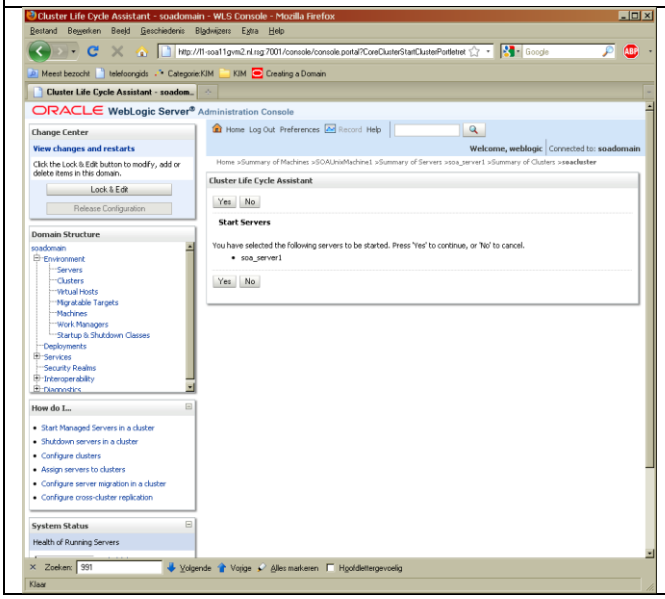
```
cd $WLS_SERVER/server/bin
./startNodeManager.sh
…
<Jan 13, 2010 3:14:19 PM> <INFO> <Secure socket listener started on port 5,556>
Jan 13, 2010 3:14:19 PM weblogic.nodemanager.server.SSLListener run
INFO: Secure socket listener started on port 5,556
```

Or unattended:

```
cd $WLS_SERVER/server/bin
nohup ./startNodeManager.sh &
```

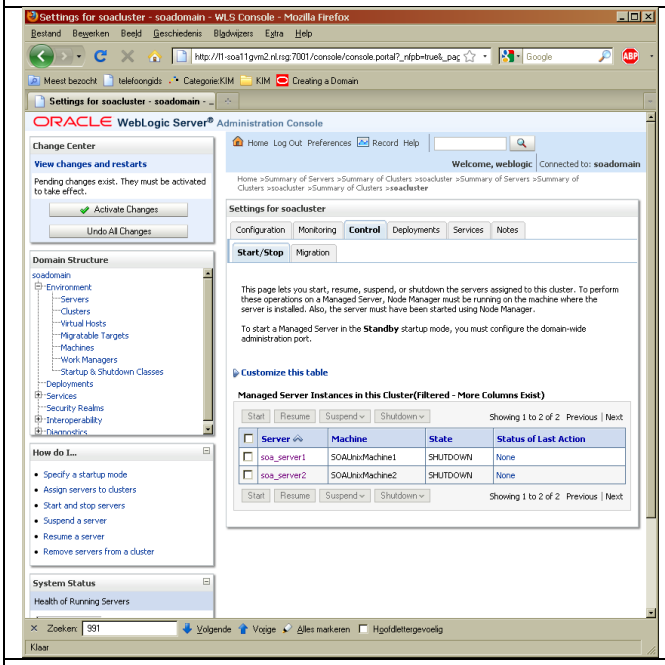
Start the SOA Managed Servers

The managed servers are started through the WLS Console:

	Logon the console. Click on Clusters. Click on soacluster Click in Control
	Select soa_server1 or soa_server2 Click on start
	Select Yes

Stop the SOA Managed Servers

The managed servers are stopped through the WLS Console:

	Logon the console. Click on Clusters. Click on soacluster Click in Control
	Select soa_server1 or soa_server2 Click on Shutdown (Force)