



An Oracle Technical Paper
July 2012

Oracle Fusion Applications

Splitting Topology from Single to Multiple Host Servers

Disclaimer

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

The purpose of this technical paper is to document how to split Fusion Applications domains to multiple machines when originally provisioned in a single machine. This is different than scaling out or scaling up Fusion Applications environment. This is also not to be confused with moving Fusion Applications from one environment to another.

Initially you begin with a single server running one or more of the Fusion Applications product families. As your business grows, you may have to split Fusion Applications from a single box to multiple boxes to support increased load and volume. This paper documents how you can scale existing single host environment – basically moving existing domains or managed servers to dedicated box to provide more load capacity. However, it is critical to note that eventually scale out is critical for failover.

The scaling of Oracle Fusion Applications involves configuring Oracle WebLogic Server. During an Oracle Fusion Applications installation, each individual product family installs into its own WebLogic Server domain. At the time of provisioning, a WebLogic cluster (with one Oracle WebLogic Server) is created for each Java EE application that is part of the product family. Hence by default, Fusion Applications is HA enabled with one server in a cluster.

In order to move from single-host to multiple environments, it is critical to understand the following definition of hosts and their purpose in Fusion Applications:

- **Primordial host:** Location of the Common domain (specifically the Administration Server of the Common domain). Only one primordial host exists in each environment.
- **Primary host:** Location where the Administration Server for a domain runs. Only one primary host exists in a domain.
- **Secondary host:** Location where the Managed Servers for any application reside when they are not on the same host as the Administration Server of the same domain. Typically used when a domain spans two physical servers.

Example on how to move SCM Domain to New Machine

In this example, the Fusion Applications is provisioned in a single box. Due to increase load and volume, you want to move all the managed servers of SCM domain to another box. I will demonstrate how it is easy to move (not migrate) managed servers of SCM domain to secondary host. This new box is called as secondary host because the “AdminServer” of SCM domain will still be running in a primordial/primary box (the original server).

These are the following high level steps

1. Configure Shared Storage
2. Configure Node Manager (in new box that will host SCM domain)
3. Configure Weblogic Server of SCM Domain to register “new” machine
4. Packing and unpacking SCM Managed Server domain home
5. Changing configuration of Managed Servers (of SCM domain)
6. Rewiring OHS virtual hosts

Shared Storage

In multiple-host environments, the shared storage is mandatory. This could be an issue if your Fusion Applications is provisioned in a local disk. However, you could overcome this limitation by using the magic of symbolic link in LINUX operating system. You still need to configure shared storage.

For example, the current Fusion Applications is installed on a local disk as “/u01/app/fa/fusionapps”. Let says the shared storage is mounted as /u01/oracle. Follow the steps to move binaries and all the instances to shared storage without changing the original path of ORACLE_BASE:

1. Copy “fa” folder from local disk to shared disk under “/u01/oracle”. It is assumed that all the processes are shut downed.
2. Create a soft link from /u01/app folder: `ln -s /u01/oracle/fa fa`
3. This will preserve the original path “/u01/app/fa” and also your contents are in shared storage.
4. Create a soft link in box 2 (new box) similarly. You do not have to copy any files as it should be available through shared storage (by mounting it).

Node Manager

You must configure Node Manager as documented in [EDG \(http://docs.oracle.com/cd/E28271_01/fusionapps.1111/e16684/node_manager.htm\)](http://docs.oracle.com/cd/E28271_01/fusionapps.1111/e16684/node_manager.htm). After following instructions here, Node Manager must be started successfully.

Sample Identity Keystore of the new box (fusionapps2.mycompany.com)

```
fusionapps2> keytool -genkeypair -keyalg RSA -alias fusionapps2.mycompany.com_fusion -
keypass Welcome1 -keystore fusionapps2.mycompany.com_fusion_identity.jks -storepass
Welcome1 -validity 180 -dname 'CN=fusionapps2.mycompany.com,
OU=defaultOrganizationUnit, O=defaultOrganization, C=US'
```

```
fusionapps2> keytool -exportcert -alias fusionapps2.mycompany.com_fusion -keystore
fusionapps2.mycompany.com_fusion_identity.jks -storepass Welcome1 -rfc -file
/tmp/appIdentityKeyStore.jks
```

Certificate stored in file </tmp/appIdentityKeyStore.jks>

```
fusionapps2> keytool -importcert -noprompt -alias fusionapps2.mycompany.com_fusion -
file /tmp/appIdentityKeyStore.jks -keystore fusion_trust.jks -storepass Welcome1
```

Certificate was added to keystore

Configure SCM Domain Weblogic Server

The “AdminServer” of SCM domain must be started for this configuration. Please follow the following steps to start “AdminServer” using WLST:

1. Set environment variable for trusted CA Keystore as: `export WLST_PROPERTIES="-Dweblogic.security.SSL.trustedCAKeyStore=/u01/app/fa/fusionapps/wlserver_10.3/server/lib/fusion_trust.jks"`
2. Start WLST as: `/u01/app/fa/fusionapps/wlserver_10.3/common/bin/wlst.sh`
3. Connect to Weblogic Server with the following WLST command as:
`nmConnect('nodemanager','Welcome1','fusionapps.mycompany.com','5556','SCMDomain','/u01/app/fa/instance/domains/fusionapps.mycompany.com/SCMDomain')`
4. Start "AdminServer" as: `nmStart('AdminServer')`
5. Please ensure that you can log into SCM domain Console.

Adding New Machine

In order to move managed servers of SCM domain, the new machine must be added to the respective domain. Please follow the section 8.3, "Adding a New Machine in the Oracle WebLogic Server Console" as defined in [EDG](#) to add new machine. Ensure that the "Listen" address is the hostname of your new box. In this example, the new machine is "fusionapps2.mycompany.com".

Packing and Unpacking Managed Server Domain Home

Please follow the section 8.4, "Packing and Unpacking the Managed Server Domain Home" as defined in [EDG](#).

For Example:

```
fusionapps2> ./pack.sh -managed=true -
domain=/u01/app/fa/instance/domains/fusionapps.mycompany.com/SCMDomain -
template=/u01/app/fa/fusionapps/user_templates/SCMDomain_managed.jar -
template_name="SCM_MANAGED_Server_Domain"

<< read domain from "/u01/oracle/fa/instance/domains/fusionapps.mycompany.com/SCMDomain"

>> succeed: read domain from
"/u01/oracle/fa/instance/domains/fusionapps.mycompany.com/SCMDomain"

<< set config option Managed to "true"

>> succeed: set config option Managed to "true"

<< write template to "/u01/oracle/fa/fusionapps/user_templates/SCMDomain_managed.jar"

.....
```

```
...
>> succeed: write template to "/u01/oracle/fa/fusionapps/user_templates/SCMDomain_managed.jar"
<< close template
>> succeed: close template

fusionapps2> ./unpack.sh -domain=/u01/app/fa/instance/domains/fusionapps2.mycompany.com/SCMDomain
-template=/u01/app/fa/fusionapps/user_templates/SCMDomain_managed.jar

<< read template from "/u01/oracle/fa/fusionapps/user_templates/SCMDomain_managed.jar"
>> succeed: read template from "/u01/oracle/fa/fusionapps/user_templates/SCMDomain_managed.jar"

<< set config option DomainName to "SCMDomain"
>> succeed: set config option DomainName to "SCMDomain"

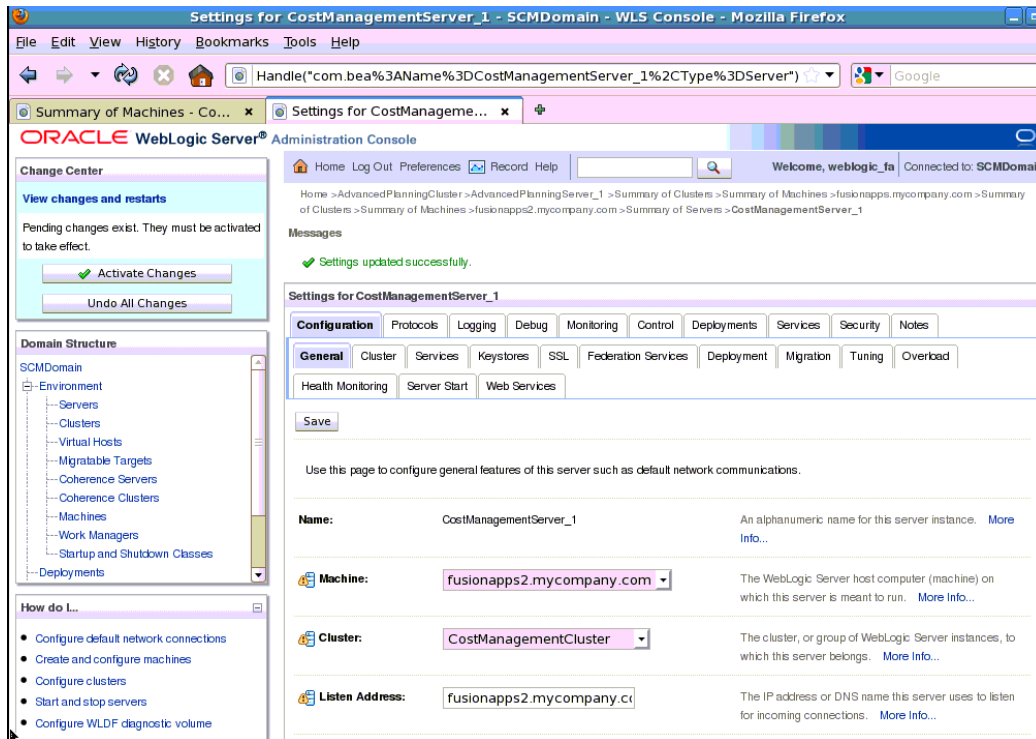
<< write Domain to "/u01/oracle/fa/instance/domains/fusionapps2.mycompany.com/SCMDomain"
.....
>> succeed: write Domain to
"/u01/oracle/fa/instance/domains/fusionapps2.mycompany.com/SCMDomain"

<< close template
>> succeed: close template
```

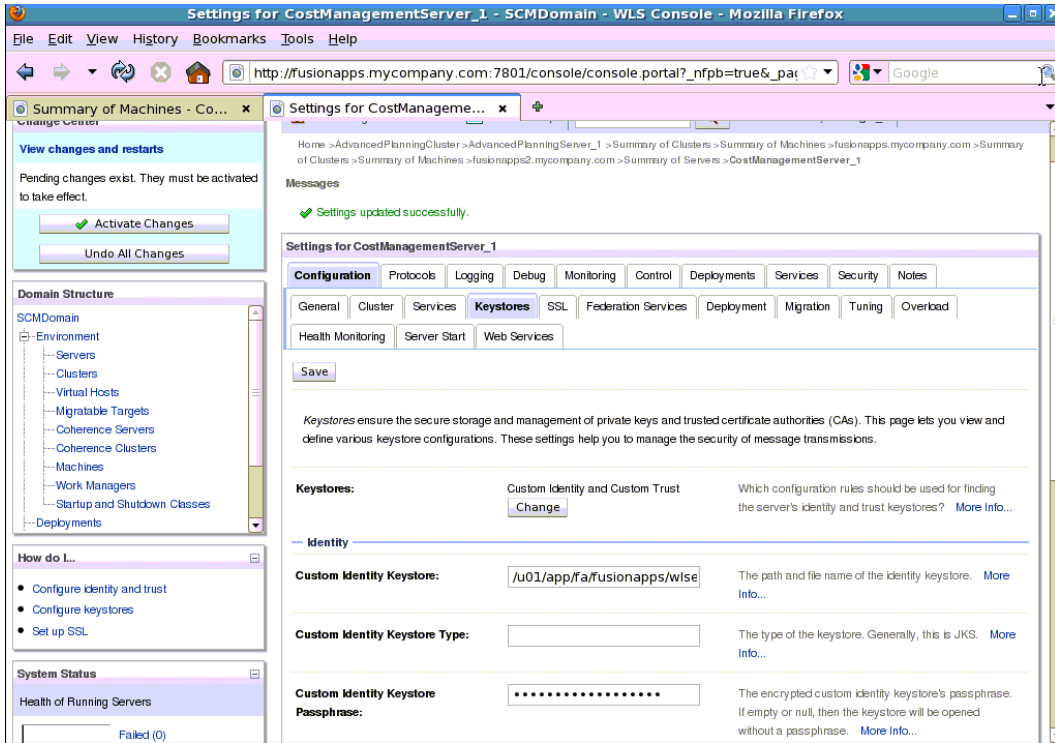
Configure SCM Managed Servers

As you may have noted that the steps so far are exactly same of scaling out environment. However, to move existing managed server to newly created machine, you must reconfigure respective managed servers (instead of cloning) so they can be started from this new machine. These are the following steps:

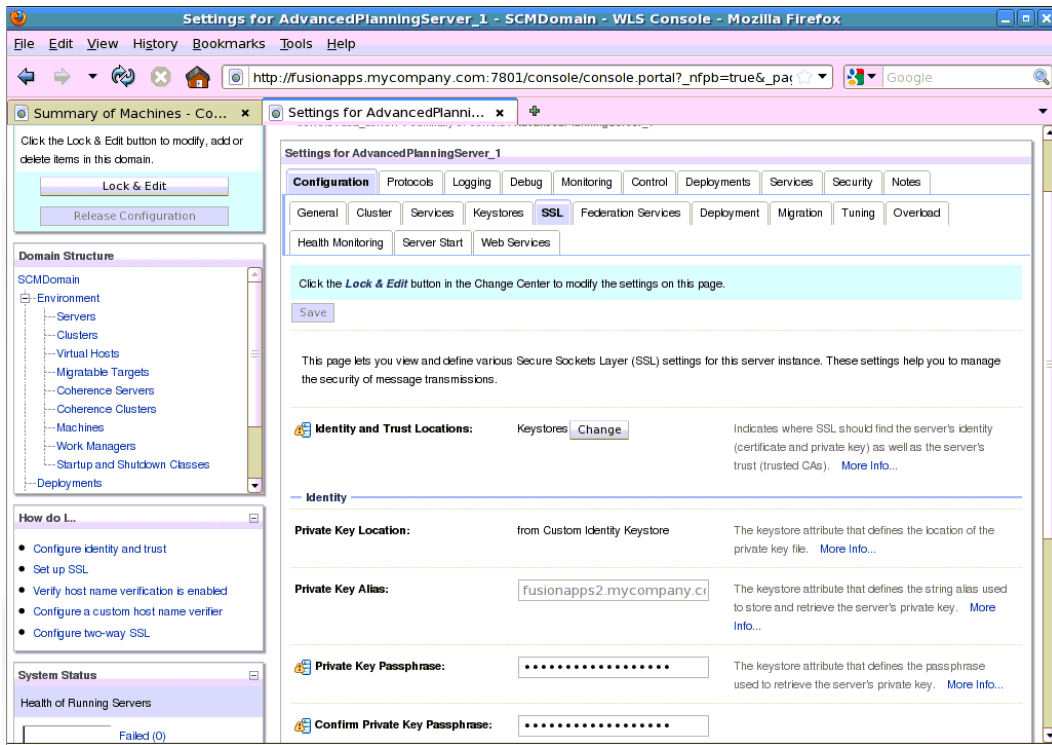
1. Modify “machine” name and “listen” address of each managed server respectively as shown below (in this sample it is fusionapps2.mycompany.com):



2. Modify custom identity keystore. This keystore is created when you have configured Node Manager. In this sample it is “fusionapps2.mycompany.com_fusion_identity.jks”. Please make sure that you do not change the path. You must change the Keystore passphrase respectively.



3. Modify private key alias in SSL. In this sample it is "fusionapps2.mycompany.com_fusion". You must change the private key passphrase respectively.



Once all the managed servers are reconfigured, make sure they start successfully in the new machine. If they fail to start, ensure that it is trying to start from new machine. If it is trying to start from old machine, then verify the configuration including of Node Manager (especially node_manager.domain file).

Rewire Oracle HTTP Server (OHS) Virtual Hosts

Once all the managed servers are started successfully, you must rewire “FusionVirtualHost_scm.conf” with new hostname (fusionapps2.mycompany.com). You must change the “WeblogicCluster” of all the “Location” element except for “/console”, “/consolehelp” and “/em” as they are rendered through “AdminServer” which is still running in your original machine. To be safe do not change the “WeblogicCluster” value of “AdminServer” port. The file location is <ORACLE_BASE>/config/CommonDomain_webtier/config/OHS/ohs1/moduleconf (as per EDG file structure).

You must restart Oracle HTTP Server.

Validating the System



Please validate all the application URLs to ensure that appropriate routing is working. As a best practice, the end-to-end unit and QA testing must be done due to dependencies between the applications and respective Weblogic domains and servers.



Oracle Fusion Applications:
Splitting Topology from Single to Multiple Host Servers
July 2012
Author: Jack Desai, A-Team

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065 U.S.A.

Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200
oracle.com

Copyright © 2011, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. UNIX is a registered trademark licensed through X/Open Company, Ltd. 1010