

Best Practices for Configuring  
Oracle Content Database Middle  
Tiers for Scalability and High  
Availability

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## INTRODUCTION

This article outlines best practices for configuring multiple instances of Oracle Content Database (Oracle Content DB) middle tiers in a scalable and highly available environment.

This article assumes that you are using Oracle Content Database 10g Release 1, that you have configured your Oracle Database and Oracle Application Server Infrastructure to meet your high availability needs, that you are using different hardware for each middle-tier configuration, and that you are ready to add additional middle tiers to your environment. This article also assumes that you are setting up Oracle Content DB in a Linux/UNIX environment.

The following sections will guide you through the process of setting up your middle tiers.

## 1 INSTALLING THE FIRST ORACLE CONTENT DB MIDDLE TIER

Install the first instance of the Oracle Content DB middle tier, following the steps outlined in the chapter “Installing the Oracle Content DB Middle Tier” in *Oracle Content Database Installation Guide*.

Oracle recommends the out-of-the box Web Cache configuration. You should not make any Web Cache changes unless directed to so by Oracle Support.

### 1.1 Configuring the First Oracle Content DB Middle Tier with a Load Balancer

The following three sections provide information on how to configure the first Oracle Content DB middle tier with a load balancer.

#### 1.1.1 Configuring the Load Balancer

To set up the load balancer to work with Oracle Content DB middle tiers, ensure that the following is configured on the load balancer:

- Set up a virtual server name (for example, `contentdb_virtual.mycompany.com`) that listens for requests on port 80 (HTTP) and routes the requests to the port on the Oracle HTTP Server port. For this example, the Oracle HTTP Server for the Oracle Content DB middle tier is running on `cdb_middletier1.mycompany.com` on port 7777.
- You should also configure the virtual server name (for example, `contentdb_virtual.mycompany.com`) to listen for requests on port 7777 (HTTP) and route the requests to the Oracle Application Server Web Cache (OracleAS Web Cache) HTTP Listen port. For this example, the OracleAS Web Cache HTTP listener for the Oracle Content DB middle tier is running on `cdb_middletier1.mycompany.com` on port 7777.
- For security reasons, port 7777 on the load balancer should not be visible to external users.
- Make sure to use cookie-based persistence on the load balancer. For example, if you are using F5 Networks' BigIP load balancer, then use "Active HTTP Cookie persistence with the Insert method".

**Note:** You can use the Oracle Enterprise Manager Application Server Control to check which ports are being used by Oracle HTTP Server and OracleAS Web Cache.

### 1.1.2 Configuring Oracle HTTP Server with the Load Balancer

To configure Oracle HTTP Server with the load balancer, perform the following steps:

1. Access the Oracle Enterprise Manager Application Server Control.
2. Click the link for the **cdb\_middletier1.mycompany.com** installation.
3. Click the **HTTP Server** link.
4. Click the **Administration** link.
5. Click **Advanced Server Properties**.
6. Open the **httpd.conf** file.
7. In **httpd.conf**, add the following lines to create a VirtualHost container for **contentdb\_virtual.mycompany.com** and port 80. Port 7778 in the following example corresponds to the Oracle HTTP Server Listen port.

```
NameVirtualHost *:7778
<VirtualHost *:7778>
ServerName contentdb_virtual.mycompany.com
Port 80
ServerAdmin you@mycompany.com
RewriteEngine On
RewriteOptions inherit
</VirtualHost>
```

Create a second VirtualHost container for **cdb\_middletier1.mycompany.com** and port 7777. Port 7778 in the following example corresponds to the Oracle HTTP Server Listen port, and port 7777 corresponds to the OracleAS Web Cache HTTP Listen port.

```
<VirtualHost *:7778>
ServerName cdb_middletier1.mycompany.com
Port 7777
ServerAdmin you@mycompany.com
RewriteEngine On
RewriteOptions inherit
</VirtualHost>
```

8. Save the **httpd.conf** file, and restart Oracle HTTP Server when prompted.

### 1.1.3 Registering the Virtual Host with mod\_osso

Follow steps below to register the new virtual host with **mod\_osso**:

1. Set the **ORACLE\_HOME** environment variable to be the current Oracle home.
2. Back up the **\$ORACLE\_HOME/Apache/Apache/conf/osso/osso.conf** file.

For example:

```
cd $ORACLE_HOME/Apache/Apache/conf/osso/
cp -p osso.conf osso.conf.orig
```

3. Execute the SSO registration script `ssoreg.sh`, which can be found under `$ORACLE_HOME/sso/bin`.

Usage:

```
ORACLE_HOME/sso/bin/ssoreg.sh \  
-site_name partner_application_site_name \  
-mod_osso_url protocol://host.domain:port_of_mod_osso_partner \  
-config_mod_osso TRUE \  
-oracle_home_path absolute_path_to_Oracle_home \  
-config_file config_file_path \  
-admin_info cn=orcladmin \  
-virtualhost
```

Parameter values in *italics* should be replaced by the actual values.

Refer to Chapter 4, "Configuring and Administering Partner Applications" in *Oracle Application Server Single Sign-On Administrator's Guide*, 10g Release 2 for more information on registration with SSO.

`$ORACLE_HOME/sso/bin/ssoreg.sh -help` also lists out all the options for `ssoreg.sh`.

As a result of this step, a partner application called `contentdb_virtual.mycompany.com` is created as an SSO partner application.

Sample Script (for Linux/UNIX):

```
$ORACLE_HOME/sso/bin/ssoreg.sh -oracle_home_path $ORACLE_HOME -site_name  
contentdb_virtual.mycompany.com -config_mod_osso TRUE -mod_osso_url  
http://contentdb_virtual.mycompany.com -admin_info cn=orcladmin -u root -  
virtualhost
```

#### 1.1.4 Configuring Oracle Content DB Domain Properties

Follow these steps to modify Oracle Content DB domain properties to use the load balancer virtual server name and port with `contentdb_virtual.mycompany.com:80`:

1. Access the Application Server Control.
2. Click the link for the `contentdb_virtual.mycompany.com` installation.
3. Click the **Content** link.
4. In the Administration section, click **Domain Properties**.
5. Click **IFS.DOMAIN.APPLICATION.ApplicationHost** and set the value to `contentdb_virtual.mycompany.com`. Then, click **OK**.
6. Click **IFS.DOMAIN.APPLICATION.ApplicationPort** and set the value to 80, the `contentdb_virtual.mycompany.com` port on the load balancer. Then, click **OK**.
7. Restart all opmn processes

### 1.1.5 Test Configuration and Setup

At this point, the first instance of the Oracle Content DB middle tier is set up with the load balancer and should be tested to make sure that the Oracle Content DB application works as expected. Test the Oracle Content DB Web application by accessing it using the new virtual load balancer address. For example:

```
http://contentdb_virtual.mycompany.com/content
```

## 2 CONFIGURING SUBSEQUENT ORACLE CONTENT DB MIDDLE TIERS WITH THE LOAD BALANCER

The following sections outline the steps associated with setting up subsequent Oracle Content DB middle tiers with the load balancer.

To install subsequent Oracle Content DB middle tiers, follow the steps in the chapter “Installing the Oracle Content DB Middle Tier” in *Oracle Content Database Installation Guide*. Then, follow the steps in the sections below to configure each subsequent middle tier with the load balancer.

### 2.1 Configuring Oracle HTTP Server with the Load Balancer

Follow the steps in section 1.1.2, "Configuring Oracle HTTP Server with the Load Balancer" of this article to register the Oracle HTTP Server on the new middle tier with the load balancer, ensuring that the virtual host container reflects the correct middle tier server name and ports.

### 2.2 Registering the Virtual Host with mod\_osso

Follow these steps to register the Virtual Host with mod\_osso:

1. Stop all OPMN processes using the command `opmnctl stopall`
2. Back up the `$ORACLE_HOME/Apache/Apache/conf/osso/osso.conf` file on `cdb_middletier2.mycompany.com`.

For example:

```
cd $ORACLE_HOME/Apache/Apache/conf/osso/  
cp -p osso.conf osso.conf.orig
```

3. Using UNIX copy or FTP (in binary mode), copy the following file from `cdb_middletier1.mycompany.com` to the same location on `cdb_middletier2.mycompany.com`:  
`$ORACLE_HOME/Apache/Apache/conf/osso/osso.conf`

4. Synchronize the DCM repository with the file, using the following command:

```
$ORACLE_HOME/Apache/Apache/bin/ssotransfer $ORACLE_HOME/Apache/Apache/conf/osso/osso.conf
```

**Note:** This does not create any new partner applications. It enables the partner application `cdbapps.contentdb_virtual.mycompany.com` registered in SSO for multiple middle tiers.

5. Start the components on `cdb_middletier2.mycompany.com` by running the following commands from the `$ORACLE_HOME/opmn/bin` directory of `cdb_middletier2.mycompany.com`:  

```
opmnctl stopall  
opmnctl startall
```
6. Log in to the OracleAS Single Sign-On Administration page as the Administrator, and use the Administrator Partner Applications page to delete the entry for the partner application associated with the new middle tier `cdbapp2.cdb_middletier2.mycompany.com`.

## 2.3 Test Configuration

To ensure that it is working, test configuration with one middle tier running and other middle tier shut down, and vice versa, accessing the application using the virtual service URL of the load balancer.

## 3 CONFIGURATION AND SETTINGS

The following sections describe some of the recommended configuration and settings that should be changed after the installation of the Oracle Content DB middle tiers.

### 3.1 Oc4jCacheSize Parameter

Oracle recommends you set the `Oc4jCacheSize` parameter to reduce the occurrences of `MOD_OC4J_0087` and related errors in your Apache error logs. To change this parameter, follow these steps:

1. Stop the OPMN processes on the middle tier.
2. On the middle-tier computer, open a terminal window and go to `$ORACLE_HOME/Apache/Apache/conf`.
3. Enter the following command:

```
cp mod_oc4j.conf mod_oc4j.conf.pre3604573
```

4. Edit the `mod_oc4j.conf` file by adding the following line after the `</IfModule>` line, but before the `Oc4Jmount /j2ee/*` line:

```
Oc4jCacheSize 0
```

5. Start the OracleOPMN processes on the middle tier.

### 3.2 Configuration of All Nodes

When an Oracle Content DB middle tier is installed and configured, the default Java heap size parameter is configured as `-Xmx256m`. If you are using Content DB for more than 70 users, this parameter should be increased. Refer to "Service Configurations and Java Memory Sizing" in the *Oracle Content Database Administrator's Guide* for more information. It is also recommended to add the `verbose:gc` option to the Java parameters to log information on the Java memory usage. Refer to "Modifying Node Configurations" in the *Oracle Content Database Administrator's Guide* for more information.

### 3.3 Rotating Your Logs

In an Oracle Content DB middle-tier environment, there are several logs that are useful for getting information about the application. Here is a list of folders where some of the log files are located:

```
$ORACLE_HOME/j2ee/OC4J_Content/application-deployments/content/OC4J_Content_default_island_1
$ORACLE_HOME/content/log/Content
$ORACLE_HOME/Apache/Apache/logs
$ORACLE_HOME/webcache/logs
$ORACLE_HOME/opmn/logs
```

Because some of these log files can get very large, it is important to manage these log files and rotate them on a periodic basis. Refer to *Oracle Content Database Administrator's Guide* and the Oracle Application Server Release 2 documentation set for information on how to manage the Oracle Content DB and Oracle Application Server log files.

## 4 CONCLUSION

This article has outlined best practices for configuring multiple instances of Oracle Content Database (Oracle Content DB) middle tiers in a scalable and highly available environment.



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