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About this Guide
This guide provides a quick reference for setting up Oracle HTTP Server load balancing using Loadbalancer.org appliances.

Related Documentation
For additional information about the Loadbalancer.org appliance, please also refer to the following documents:

- Quick Start Guide
- Administration Manual

Oracle HTTP Server
Oracle HTTP Server is at the heart of Oracle Application Server and is based on Apache.

Ports
By default Oracle HTTP Server listens on HTTP port 7777 and HTTPS is disabled. When HTTPS is enabled the default port is 4443.

Httpd.conf & Ssl.conf Configuration Files
It's important to note that 'Port' should be set to be the port that is being used by the load balancer (80/443) and 'Listen' should be set to the port that Oracle HTTP Server is actually listening on (7777/4443). By doing this, redirects or other URLs generated by Oracle HTTP Server point to the load balancer rather than directly to the Oracle HTTP Server.

For more details please refer to the following Oracle link:
http://docs.oracle.com/cd/B14099_19/web.1012/b14007/netconf.htm

To enable HTTPS please refer to the following Oracle link:
http://docs.oracle.com/cd/B14099_19/web.1012/b14008/ssl.htm

Load Balancer Configuration
The load balancer is configured to listen on ports 80/443 and using port translation forward requests to 7777/4443. This way the Oracle HTTP Servers can be left at their default values and clients can connect on standard HTTP/HTTPS ports.

If clients are configured to connect to the default OHS ports (7777/4443) rather than the standard HTTP/HTTPS ports (80/443) then the VIPs should be configured to listen on these ports rather than on ports 80 & 443.

Load Balanced Ports

<table>
<thead>
<tr>
<th>Client Connection Port</th>
<th>Default OHS Port</th>
<th>Upper level Protocol</th>
<th>Lower level Protocol</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>80*</td>
<td>7777</td>
<td>HTTP</td>
<td>TCP</td>
<td></td>
</tr>
<tr>
<td>443*</td>
<td>4443</td>
<td>HTTPS</td>
<td>TCP</td>
<td>Applies if HTTPS is enabled on the servers</td>
</tr>
</tbody>
</table>

* applies only if clients will connect on standard HTTP/HTTPS ports rather than the default OHS ports.

### Operation Mode
The load balancer is configured in single-arm layer 7 SNAT mode. Source IP persistence is enabled to ensure clients connect to the same HTTP server for the duration of their session.

### Configuration Diagram
The following diagram shows that clients connect to the Virtual Service (VIP) on the load balancer rather than directly to one of the Oracle servers.

![Configuration Diagram](image.png)

### Deploy The Loadbalancer.org Appliance
Deploy the Loadbalancer.org appliance as detailed in the [Quick Start Guide](http://quick.startguide).

### Accessing The Appliance WebUI
Using a browser, navigate to the appliance’s IP address on HTTPS port **9443**, i.e.

`https://<IP-Address>:9443`

Note: For HTTPS connections you’ll receive a warning about the certificate as it’s a self signed cert not related to an Internet based CA.

Use the following default credentials to login:
Username: loadbalancer
Password: loadbalancer

Note: To change the password for the 'loadbalancer' account, use the WebUI option: Maintenance > Passwords.

Once logged in, the WebUI is displayed:
Configuration Steps

STEP1 - Configure General Settings

Default Ports
By default the load balancer uses port 7777 for the layer 7 statistics page. This must be changed to a different port to avoid conflicting with Oracle requirements. To do this follow the steps below:

1. Using the WebUI, navigate to: Cluster Configuration > Layer 7 – Advanced Configuration

![Layer 7 - Advanced Configuration](image)

2. Change Statistics Port from the default value of 7777 to an appropriate value, e.g. 8777 as shown above
3. Click the Update button to save the settings

Timeouts
To ensure that client connections remain open during periods of inactivity, the Client Timeout and Real Server Timeout values should be changed from their default values of 43 seconds and 45 seconds respectively to 30mins. To do this follow the steps below:

1. Using the WebUI, navigate to: Cluster Configuration > Layer 7 – Advanced Configuration

![Layer 7 - Advanced Configuration](image)

2. Change Client Timeout to 1800000 as shown above (i.e. 30 minutes)
3. Change Real Server Timeout to 1800000 as shown above (i.e. 30 minutes)
4. Click the Update button to save the settings
STEP 2 - Create The HTTP Virtual Service & Define Real Servers

Create the Virtual Service (VIP)

Create a new VIP as described below – this is the IP address that clients will connect to:

1. Using the WebUI, navigate to: Cluster Configuration > Layer 7 – Virtual Service and click Add a New Virtual Service
2. Enter the following details:

   ![Layer 7 - Add a New Virtual Service](image)

   3. Enter an appropriate label for the VIP, e.g. OracleAS-http
   4. Set the Virtual Service IP address field to the required IP address, e.g. 192.168.10.10
   5. Set the Virtual Service Ports field to 80 (set to port 7777 if default OHS ports are used)
   6. Click Update
   7. Click Modify next to the newly created VIP
   8. Change Persistence Mode to Source IP
   9. Leave Persistence Timeout set to 30 (i.e. 30 minutes)
   10. Click Update

Define the Real Servers (RIPs)

1. Using the WebUI, navigate to: Cluster Configuration > Layer 7 – Real Servers and click Add a new Real Server next to the newly created VIP
2. Enter the following details:
3. Enter an appropriate label for the RIP, e.g. **OHS1**
4. Change the **Real Server IP Address** field to the required IP address, e.g. **192.168.10.2**
5. Change the **Real Server Port** field to **7777**
6. Click **Update**
7. Repeat the above steps to add your other OHS Server(s)

**STEP3 - Create The HTTPS Virtual Service & Define Real Servers**

**Note:** This VIP is only required if HTTPS has been enabled on the Oracle Servers

Create the Virtual Service (VIP)

Create a new VIP as described below – this is the IP address that clients will connect to:

1. Using the WebUI, navigate to: **Cluster Configuration > Layer 7 – Virtual Service** and click **Add a New Virtual Service**
2. Enter the following details:
3. Enter an appropriate label for the VIP, e.g. OracleAS-https
4. Set the Virtual Service IP address field to the required IP address, e.g. 192.168.10.10
5. Set the Virtual Service Ports field to 443 (set to 4443 if default OHS ports are used)
6. Change Layer 7 Protocol to TCP Mode
7. Click Update
8. Click Modify next to the newly created VIP
9. Ensure Persistence Mode is set to Source IP
10. Leave Persistence Timeout set to 30 (i.e. 30 minutes)
11. Click Update

Define the Real Servers (RIPs)
1. Using the WebUI, navigate to: Cluster Configuration > Layer 7 – Real Servers and click Add a new Real Server next to the newly created VIP
2. Enter the following details:

   ![Real Server Configuration](image)

   3. Enter an appropriate label for the RIP, e.g. OHS1
   4. Change the Real Server IP Address field to the required IP address, e.g. 192.168.10.2
   5. Change the Real Server Port field to 4443
   6. Click Update
   7. Repeat the above steps to add your other OHS Server(s)

STEP4 – Finalizing The Configuration
To apply the new settings, HAProxy must be restarted as follows:

1. Using the WebUI, navigate to: Maintenance > Restart Services and click Restart HAProxy

STEP5 – Testing & Verification
Now test the load balancer by connecting clients to the VIP address (192.168.10.10 in this example configuration) instead of connecting users directly to the Oracle HTTP Servers.
Loadbalancer.org Technical Support

If you have any questions regarding the appliance or would like assistance designing your deployment, please don't hesitate to contact our support team: support@loadbalancer.org.
Document Revision History

<table>
<thead>
<tr>
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<th>Date</th>
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<th>Reason for Change</th>
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<td>1.3.0</td>
<td>5 November 2019</td>
<td>Styling and layout</td>
<td>General styling updates</td>
<td>AH</td>
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About Loadbalancer.org

Loadbalancer.org’s mission is to ensure that its clients’ businesses are never interrupted. The load balancer experts ask the right questions to get to the heart of what matters, bringing a depth of understanding to each deployment. Experience enables Loadbalancer.org engineers to design less complex, unbreakable solutions - and to provide exceptional personalized support.