Microsoft Sharepoint 2010 Deployment Guide

v1.2.4

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About this Guide

This guide details the configuration of Loadbalancer.org appliances for deployment with Microsoft Sharepoint 2010. It includes details of ports/services that must be load balanced, topology considerations for the various Sharepoint 2010 components and also steps on how to configure the appliances.

For an introduction on setting up the appliance as well as more technical information, please also refer to our quick-start guides and full administration manuals which are available at the following links:

Version 7.x

Quickstart guide: http://www.loadbalancer.org/pdf/quickstartguideLBv7.pdf

Administration manual: http://www.loadbalancer.org/pdf/loadbalanceradministrationv7.pdf

Version 6.x

Quickstart guide: http://www.loadbalancer.org/pdf/quickstartguideLB.pdf

Administration manual: http://www.loadbalancer.org/pdffiles/loadbalanceradministration.pdf

Appliances Supported

All our products can be used with Sharepoint 2010. The complete list of models is shown below:

- Enterprise R16
- Enterprise
- Enterprise MAX
- Enterprise 10G
- Enterprise VA
- Enterprise VA R16

For a full specification comparison of these models please refer to: http://www.loadbalancer.org/matrix.php

Microsoft Sharepoint Software Versions Supported

- Microsoft Sharepoint 2010 – all versions

Loadbalancer.org Software Versions Supported

- v7.3.2 and later
- v6.15 and later

Sharepoint Server 2010

Microsoft Sharepoint 2010 is Microsoft's enterprise collaboration platform. Sharepoint makes it easier for people to work together. Using Sharepoint 2010, staff can set up web sites to share information with others, manage documents from start to finish, publish reports to help everyone make better decisions and search across a range of internal and external data sources to find answers and information more quickly and effectively.

Server Roles

In Sharepoint 2010 what were roles in prior versions of the product can now be viewed simply as components, so as opposed to assigning a specific role to a server, components are placed on an agnostic machine, independent of any specific role definition. For example, in the past the role of indexer or query server was assigned to a machine, now the search topology is extended by assigning one or more search components, such as Query or Crawl to a machine. Roles are a concept that do not necessarily apply in 2010, instead a machine is generic and flexible to provide a multitude of services. Components and services are shared between servers in the farm depending on server performance, topology requirements, anticipated user load etc.

Installation Options

The Sharepoint installation supports two options as described in the table below:

Option	Description
Standalone	Installs all components on a single machine including SQL Express, but servers cannot be added to a server farm, typically only used for trialling the product or for very small deployments
Complete	Installs all components (except SQL Express) and allows servers to be added to a farm – this option must always be used in a Farm environment

Farm Size & Topology

The physical architecture is typically described in two ways: by its size and by its topology. Size, which can be measured in several ways, such as the number of users or the number of documents, is used to categorize a farm as small, medium, or large. Topology uses the idea of tiers or server groups to define a logical arrangement of farm servers. Microsoft uses the following definitions for size and topology:

Farm Size:

Size	Description
Small	A small server farm typically consists of at least two Web servers and a database server
Medium	A medium server farm typically consists of two or more Web servers, two application servers, and more than one database server
Large	A large server farm can be the logical result of scaling out a medium farm to meet capacity and performance requirements or by design before a Sharepoint Server solution is implemented

Farm Topology:

Topology	Description
Single-Tier	In a single-tier deployment, Sharepoint Server and the database server are installed on one computer
Two-Tier	In a two-tier deployment, Sharepoint Server components and the database are installed on separate server
Three-Tier	In a three-tier deployment, the front-end Web servers are on the first tier, the application servers are on the second tier, which is known as the application tier, and the database server is located on the third tier

For more information please refer to: http://technet.microsoft.com/en-us/library/ee667264.aspx

Load Balancing Sharepoint 2010

The Basics

Load balancing is required for the Front-end Web Servers to provide performance and resilience for users connecting to the Sharepoint farm.

For the middle (application) tier, multiple application servers running the same service applications are load balanced by default and there is no external load balancing requirement.

Sharepoint 2010 is based on IIS and associated technologies at the top / middle tier and Microsoft SQL Server for back-end storage. Therefore, load balancing Sharepoint 2010 is relatively straight- forward, but to provide a resilient and robust Sharepoint system, it's important to consider Microsoft's various architectural recommendations, best practices and guidelines when designing your Sharepoint Infrastructure.

TCP Ports

Sharepoint uses a range of ports for internal and external farm communication. The ports that need to be load balanced are those used in communications between external users and the Front-End Web Servers as shown in the following table:

TCP Port	Use	Description
80	Web Front-End	Standard HTTP port used for Web Application / Site access
443	Web Front-End	Standard HTTPS port used for Web Application / Site access
8080*	Central Admin	Custom port for Central Administration Website (HTTP)
8443**	Central Admin	Custom port for Central Administration Website (HTTPS)

* During the Sharepoint 2010 installation the installer suggests a random HTTP port for the Central Administration website. In the lab environment used for this guide, this was set to port 8080

** In the lab environment, the Central Administration website was extended to the Extranet zone and configured for HTTPS on port 8443. System administrators are then able to access the Central Administration website over HTTP and HTTPS

For a full Sharepoint Server port list, please refer to:

http://technet.microsoft.com/en-us/library/cc262849.aspx

Persistence (aka Server Affinity)

Enabling persistence ensures that clients continue to connect to the same server when connecting into the Sharepoint farm. We recommend using IP persistence for simplicity and compatibly across protocols.

Load Balancer Virtual Server/Service (VIP) Requirements

NOTE: Prior to v7.5 a VIP is known as a 'Virtual Server', from v7.5 onwards it's known as a 'Virtual Service'.

It is possible to configure a single VIP that includes all required ports as listed in the table above. However, to enable more granular control and improved health-check monitoring, multiple Virtual Servers/Services are recommended. The list below shows the general approach used in this guide:

- **VIP-1**: For the Sharepoint User Portal, typically running on the default HTTP (80) & HTTPS (443) ports

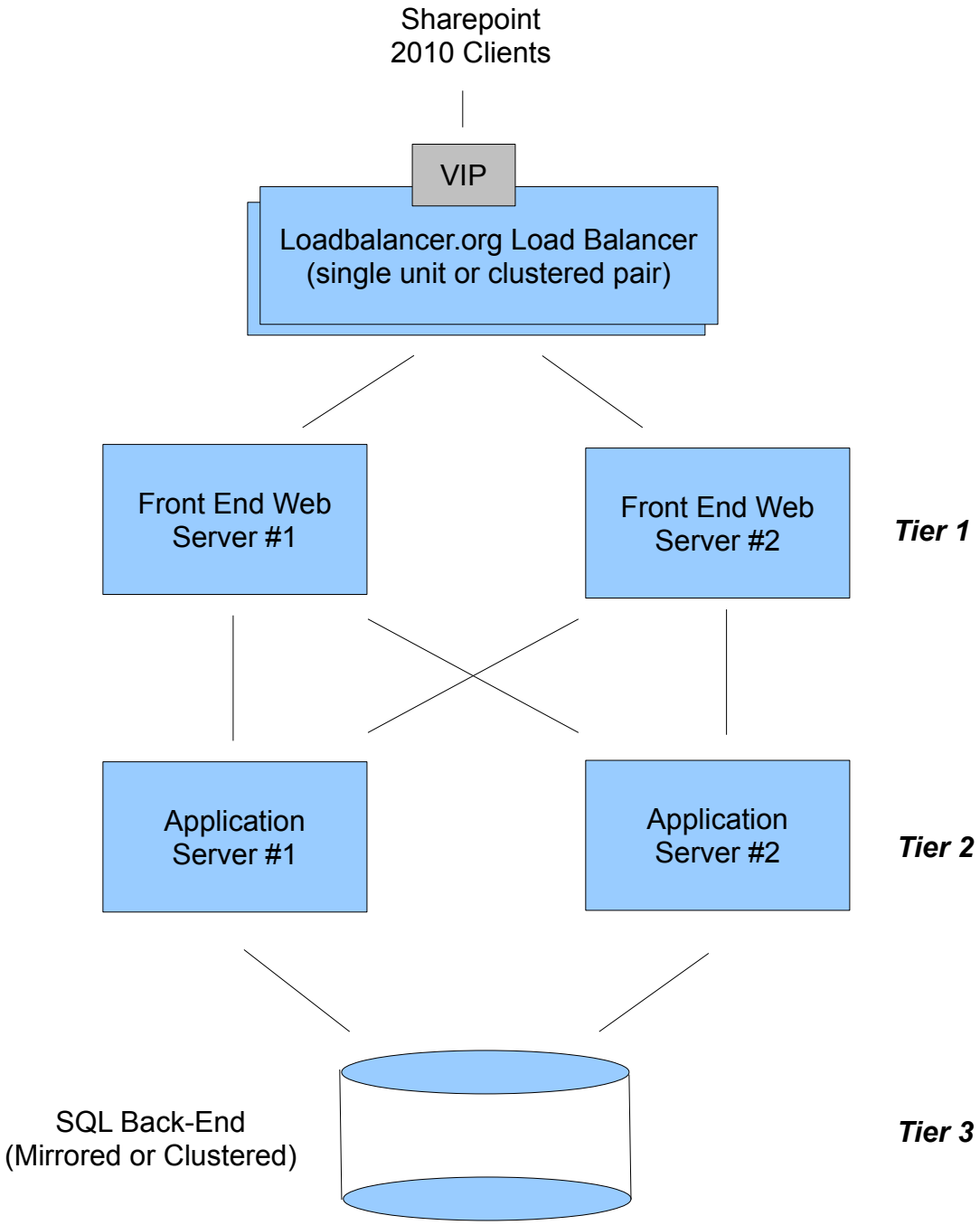
- **VIP-2**: For the Load balanced Central Administration site running on the port selected (in this guide 8080 & 8443)

- **VIP-3** etc.: For any additional Sharepoint Web Applications / IIS sites created

NB. In the lab setup used for this guide, the Web Servers have a single IP address. Also all VIPs configured on the load balancer use the same IP address with different ports. The VIPs could also be configured using different IP addresses if needed.

Lab Deployment Architecture

There are multiple ways to deploy Sharepoint 2010 depending on a number of factors including number of end-users, physical server topology options / preferences etc. For the lab environment used in this guide, the following 3-tier redundant topology was used:



The load balancer can be deployed as a single unit, although Loadbalancer.org strongly recommends a clustered pair for resilience & high availability.

Lab Environment Architecture Notes

Planning for High Availability

The following table shows Microsoft's general guidance to achieve high availability:

Server	**Preferred redundancy strategy within a farm**
Front-end Web Server	Deploy multiple front-end Web servers within a farm, and use Load Balancing
Application Server	Deploy multiple application servers within a farm
Database Server	Deploy database servers by using clustering or high-availability database mirroring

For more details please refer to the following Microsoft link:

http://technet.microsoft.com/en-us/library/cc748824.aspx

Front-End Web Servers

Two Front-end Web Servers are used to provide redundancy. These servers are load balanced by the Loadbalancer.org appliances (clustered pair for high availability). The servers also run the query related components so the index is also located on these servers. Therefore the index files should be located on a disk which has the capacity and performance required. Multiple query components can be added for fault tolerance and improved performance. For more details on the Sharepoint search / query architecture the following Microsoft link provides a useful insight:

http://blogs.msdn.com/b/russmax/archive/2010/04/16/search-2010-architecture-and-scale-part-2-query.aspx

Application Servers

Two application servers are used to provide redundancy. Both servers run the same service applications which enables built in load balancing. This distributes requests from the Web Servers on a round-robin basis. For more details on the built-in service application load balancer, please refer to the following Microsoft link:

http://blogs.msdn.com/b/dtaylor/archive/2011/02/23/sharepoint-2010-service-application-load-balancer.aspx

In the lab setup, these servers also run the crawl components. Multiple crawl components can be added for fault tolerance and improved performance. For more details on the Sharepoint Search architecture and configuring crawl the following Microsoft link provides a useful insight:

http://blogs.msdn.com/b/russmax/archive/2010/04/16/search-2010-architecture-and-scale-part-1-crawl.aspx

Database Server

In a live environment the SQL back-end should be mirrored, clustered or made redundant in any other appropriate way. For more details on SQL database clustering and mirroring for Sharepoint 2010 please refer to the following Microsoft links:

Planning for availability: http://technet.microsoft.com/en-us/library/cc748824.aspx

Clustering & Mirroring SQL Server for Sharepoint: http://technet.microsoft.com/en-us/library/dd207313.aspx

Sharepoint Installation & Configuration

Installation Considerations

Central Administration Website

For improved resilience and redundancy the Central Administration website can also be load balanced. This requires that the Central Administration component is installed on multiple servers – this is done during initial installation of the software by selecting the Advanced Settings, Host Central Administration Website & checking “Use this machine to host the website”. In the lab environment used for this guide, Central Administration is installed on both Front-End Web Servers.

Alternate Access Mappings / Zones

Alternative Access Mappings must be setup correctly to ensure that users are able to connect consistently without receiving broken links and experiencing other issues. These are configured automatically when new Web Applications are created and extended using Central Administration. If manual changes are made later to Sharepoint or IIS, the mappings may also need to be adjusted manually.

Microsoft recommends extending a Web Application to a new IIS web site for each zone required. This provides a backing IIS Web site. Its not generally recommended to reuse the same IIS web site for multiple zones. For more information please refer to the following Microsoft link:

http://technet.microsoft.com/en-us/library/cc261814%28office.12%29.aspx

Authentication

Sharepoint 2010 supports various authentication methods, the method used in this guide is NTLM which is the default.

SSL Certificates

For full end-to-end SSL encryption, installing SSL certificates on the Sharepoint 2010 Web Servers is recommended. For the lab setup two test Thawte certificates were used – one for each Front-End Web Server. In both cases the Common Name was set to 'portal.justtesting.com'.

Service Applications

For a three-tier infrastructure, Service Applications should be distributed between the servers in each tier according to the topology in use. The complete installation option and the Configuration Wizard should be used to provision all service applications on each server. Central Administration can then be used to configure where each service runs.

DNS Configuration

DNS records must be configured that point to the Virtual Server/Services on the load balancer. For the lab setup, Internal DNS entries were created for 'portal' and for external testing a DNS entry was added to the local hosts file of a non domain test client.

Lab Environment Installation

Basic Site / Zone Structure

Site	Zone	Ports	Host Header Value
Central Administration	default	8080	'portal'
Central Administration	Extranet	8443	-
Sharepoint User Portal	default	80	'portal'
Sharepoint User Portal	Extranet	443	-

Outline Installation Steps

- Install and prepare Microsoft SQL Server
- Install Sharepoint 2010 on both Web Servers. Install Central Administration on both servers. Use the Farm / Complete install option, run the Configuration Wizard and deploy all Service Applications. Later, these services can be enabled or disabled as required on the various servers depending on their purpose
- Install Sharepoint 2010 on both Application Servers. Use the complete install option, run the Configuration Wizard and deploy all Service Applications. Later, these services can be enabled or disabled as required
- Create a Web Application / site collection for the Sharepoint User Portal
- Set host header values for the Central Administration & User Portal sites
- Extend the Central Administration site to the Extranet zone on port 8443 / SSL
- Extend the User Portal site to the Extranet zone on port 443 / SSL
- Configure SSL certificates on both Web Servers for the HTTPS sites. In both cases CN=portal.justtesting.com, so the same certificate is used for both the secure portal and the secure Central Administration site
- Create an internal DNS entry for 'portal', this should point to the IP address of the Virtual Server/Service created on the load balancer (see pages 19 & 22).
- Create an external DNS entry on the non domain test client for 'portal.justtesting.com', again this should point to the Virtual Server/Service created on the load balancer (see pages 19 & 22).

User Access to Sharepoint

With the configuration described above, the following table shows how Sharepoint is accessed in the lab environment:

Site	Internal	External (Extranet)
Sharepoint User Portal	http://portal	https://portal.justtesting.com
Central Administration	http://portal:8080	https://portal.justtesting.com:8443

Useful Sharepoint Cmdlets

There are many Sharepoint commands that can be run through the Sharepoint 2010 Management shell. A couple of useful examples are listed below:

1) Set the Central Admin Site Port:

set-spcentraladministration -port <port>

or to be able to specify SSL:

stsadm -o setadminport -port <port> -ssl

(N.B. this is a 2007 method but is also valid for 2010)

2) Create a new Central Administration Site:

new-spcentraladministration -port <port>

N.B. A full listing of all Sharepoint 2010 Powershell cmdlets is available at the following link:

http://technet.microsoft.com/en-us/library/ff678226.aspx

Loadbalancer.org Appliance – the Basics

Network Configuration

The IP address, default gateway and DNS settings can be configured in several ways depending on the version as detailed below.

v7.5 & Later

Configure the IP address, Default Gateway & DNS Settings

Using the Network Setup Wizard at the console:

After boot, follow the console instructions to configure the IP address, gateway and DNS settings..

Using the WUI:

Using a browser, connect to the WUI on the default IP address/port: **http://192.168.2.21:9080**

to set the IP address use: *Local Configuration* > *Network Interface Configuration*
to set the default gateway use: *Local Configuration* > *Routing*
to configure DNS settings use: Local Configuration > *Hostname & DNS*

Using Linux commands:

At the console, set the initial IP address using the following command:

```
ip addr add <IP address>/<mask> dev eth0
e.g. ip addr add 192.168.2.10/24 dev eth0
```

At the console, set the initial default gateway using the following command:

```
route add default gw <IP address> <interface>
e.g. route add default gw 192.168.2.254 eth0
```

At the console, set the DNS server using the following command:

```
echo nameserver <IP address> >> /etc/resolv.conf
e.g. echo nameserver 192.168.64.1 >> /etc/resolv.conf
```

N.B. If this method is used, you must also configure these settings using the WUI, otherwise settings will be lost after a reboot

v7.3.2 – v7.4.3

Configure the IP address & Default Gateway

Using the Network Setup Wizard at the console:

After boot, follow the console instructions to configure the IP address and gateway using the Network Setup Wizard.

N.B. For these software versions the network setup wizard does not support DNS server configuration. DNS servers must be defined using the WUI or Linux commands as explained below.

Configure the IP address, Default Gateway & DNS Settings

Using the WUI:

Using a browser, connect to the WUI on the default IP address:port: **http://192.168.2.21:9080**

to set the IP address use: *Edit Configuration > Network Interface Configuration*
to set the default gateway use: *Edit Configuration > Routing*
to configure DNS settings use: *Edit Configuration > Hostname & DNS*

Using Linux commands:

At the console, set the initial IP address using the following command:
```
ip addr add <IP address>/<mask> dev eth0
e.g. ip addr add 192.168.2.10/24 dev eth0
```

At the console, set the initial default gateway using the following command:
```
route add default gw <IP address> <interface>
e.g. route add default gw 192.168.2.254 eth0
```

At the console, set the DNS server using the following command:
```
echo nameserver <IP address> >> /etc/resolv.conf
e.g. echo nameserver 192.168.64.1 >> /etc/resolv.conf
```

N.B. If this method is used, you must also configure these settings using the WUI, otherwise settings will be lost after a reboot

v6.x

Configure the IP address, Default Gateway & DNS Settings

Using the WUI:

Using a browser, connect to the WUI on the default IP address:port: **http://192.168.2.21:9080**

to set the IP address & default gateway use: *Edit Configuration > Network Interface Configuration*
to configure DNS settings use: *Edit Configuration > DNS & Hostname*

N.B. The Virtual Appliance attempts to use DHCP to obtain its initial IP address, default gateway and DNS settings. The IP address allocated will be displayed on the console once the boot process is complete

Using Linux commands:

At the console, set the initial IP address using the following command:
```
ifconfig eth0 <IP address> netmask <netmask> up
e.g. ifconfig eth0 192.168.2.10 netmask 255.255.255.0 up
```

At the console, set the initial default gateway using the following command:
```
route add default gw <IP address> <interface>
e.g. route add default gw 192.168.2.254 eth0
```

At the console, set the DNS server using the following command:
```
echo nameserver <IP address> >> /etc/resolv.conf
e.g. echo nameserver 192.168.64.1 >> /etc/resolv.conf
```

N.B. If this method is used, you must also configure these settings using the WUI, otherwise settings will be lost after a reboot

Accessing the Web User Interface (WUI)

The WUI can be accessed from a browser at: ***http://192.168.2.21:9080/lbadmin***

** Note the port number → 9080*

(replace 192.168.2.21 with the IP address of your load balancer if its been changed from the default)

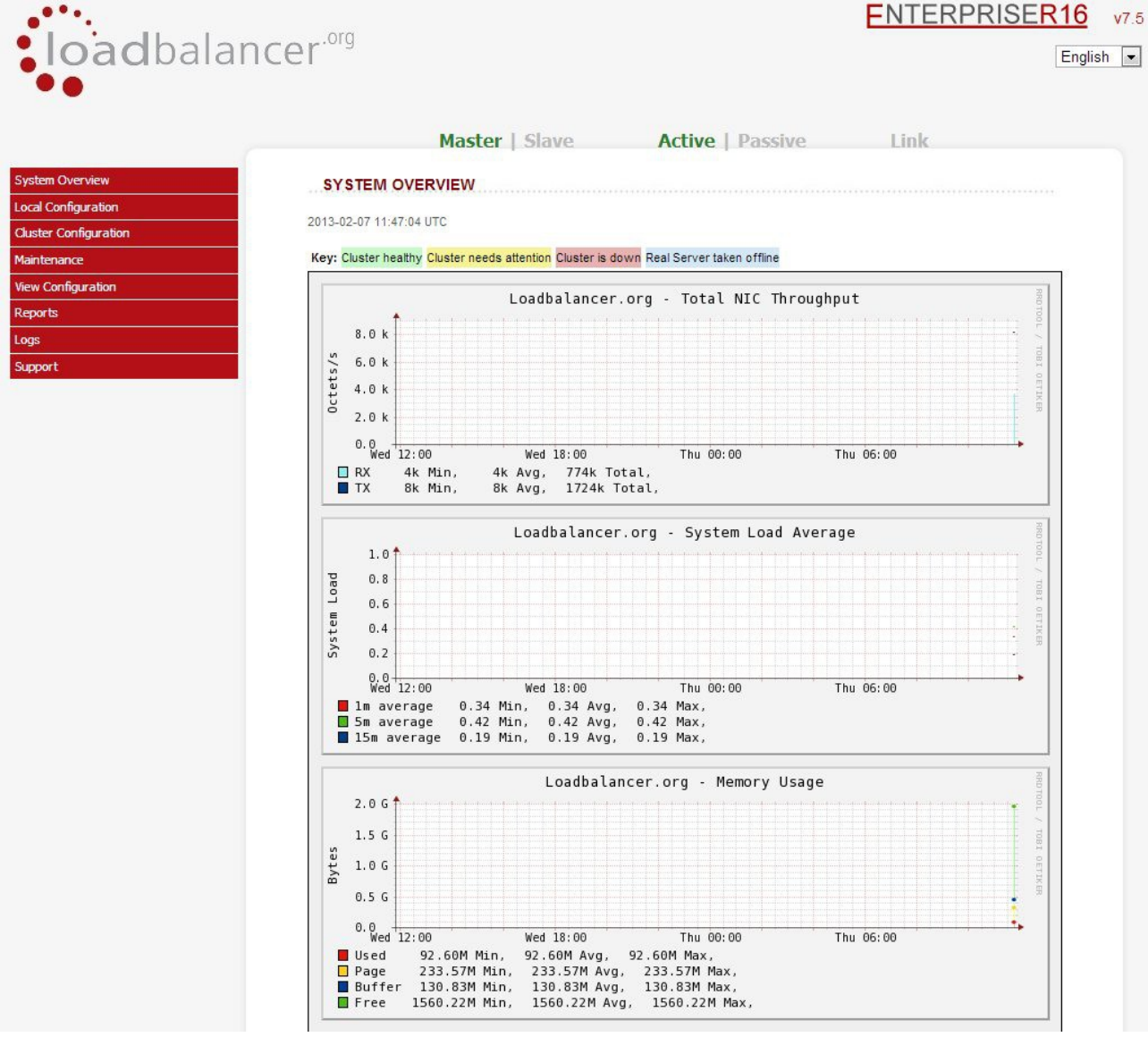
Username: loadbalancer

Password: loadbalancer

Once you have entered the logon credentials the Loadbalancer.org Web User Interface will be displayed as shown below:

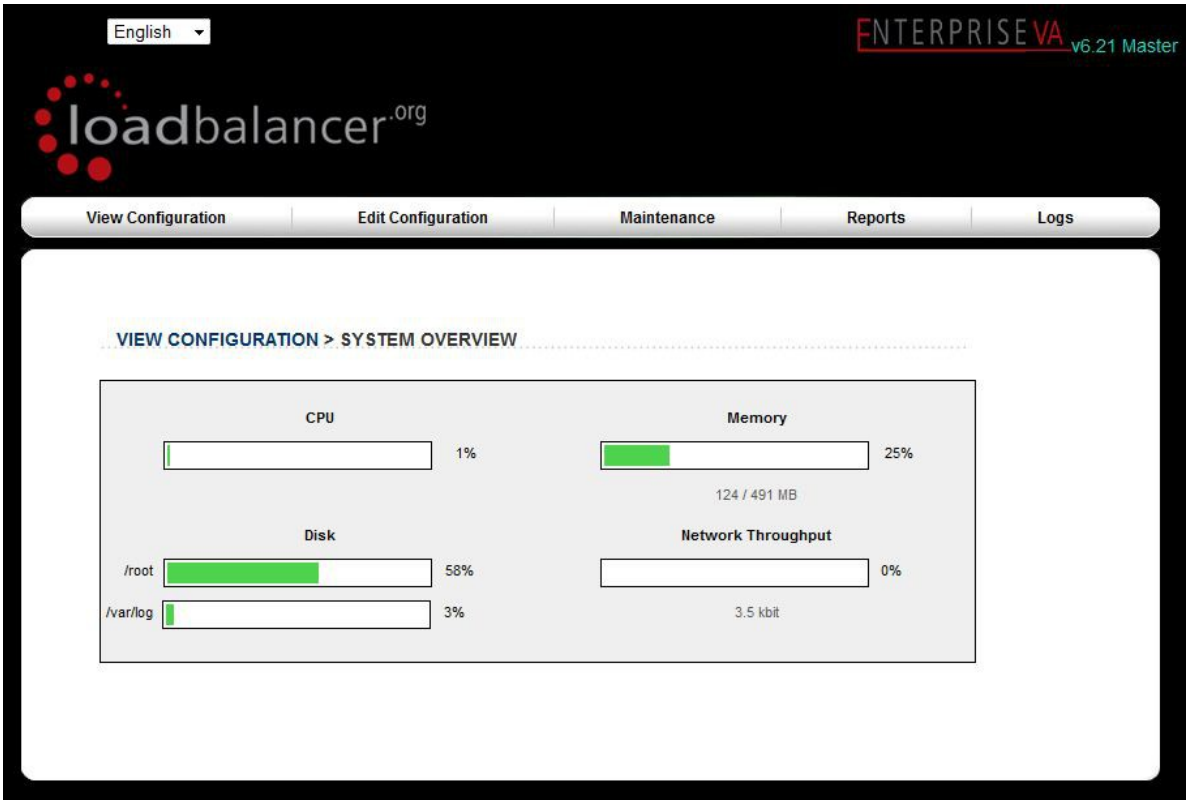
v7.x

The screen shot below shows the v7.5 WUI once logged in:



v6.x

The screen shot below shows the V6.21 WUI once logged in:



Load Balancer Deployment Method

As with other Microsoft applications, for Sharepoint 2010 the load balancer is deployed in one-arm SNAT mode (Source Network Address Translation) at layer 7 using HAProxy. This mode is generally recommended by Microsoft and also has the advantage that it requires no changes to the Sharepoint 2010 servers.

NB. The configuration wizard should not be used since this will configure a Layer 4 Virtual Server/Service which is not required in this case.

Clustered Pair Configuration

Loadbalancer.org recommend that load balancer appliances are deployed in pairs for high availability. In this guide single units are deployed first, adding a secondary slave unit is covered in the Appendix.

Loadbalancer.org Appliance – Configuring for Sharepoint

NOTE: It's highly recommended that you have a working Sharepoint 2010 environment first before implementing the load balancer.

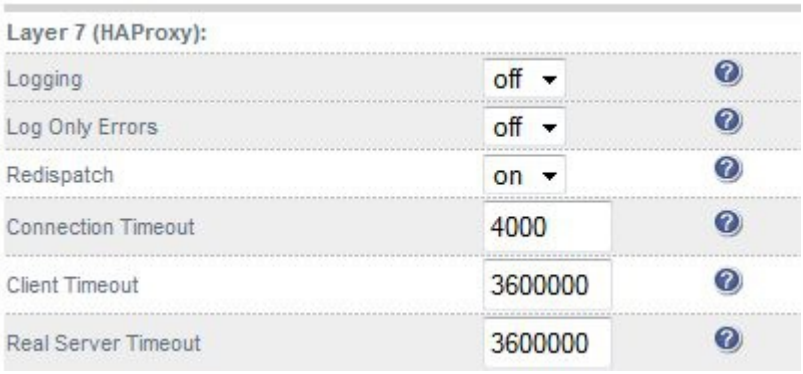
N.B. The steps presented in this section cover versions 6.x, v7.3.2 thru v7.4.3 and v7.5 & later of the Appliance.

STEP1 – Configure Layer 7 Global Settings

Set HAProxy's client and server timeouts to 1 hour as shown below:

v7.x

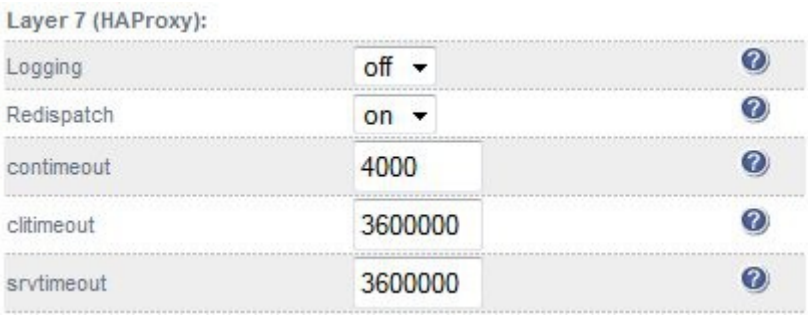
- v7.5 & later – Using the WUI go to *Cluster Configuration* > *Layer 7 – Advanced Configuration*
- v7.3.2 – v7.4.3 – Using the WUI go to *Edit Configuration* > *Layer 7 – Advanced Configuration*



- Change *Client Timeout* to **3600000** as shown above (i.e. 1 hour)
- Change *Real Server Timeout* to **3600000** as shown above (i.e. 1 hour)
- Click the **Update** button to save the settings

v6.x

- Using the WUI, go to: *Edit Configuration* > *Global Settings* > *Layer 7 (HAProxy)*



- Change *clitimeout* to **3600000** as shown above (i.e. 1 hour)
- Change *svrtimeout* to **3600000** as shown above (i.e. 1 hour)
- Click the **Update** button to save the settings

STEP2 – Configure the Load balanced Central Administration Site

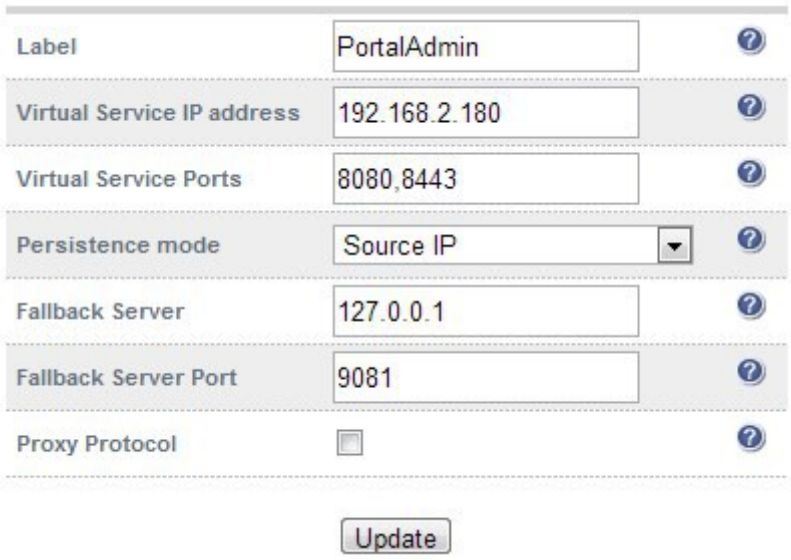
Create the Virtual Server/Service (VIP)

This VIP is used to provide access to the Central Administration website on ports 8080 & 8443.

v7.x

NOTE: Prior to v7.5 a VIP is known as a 'Virtual Server', from v7.5 onwards it's known as a 'Virtual Service'. For simplicity the configuration steps below refer to 'Virtual Service' for both.

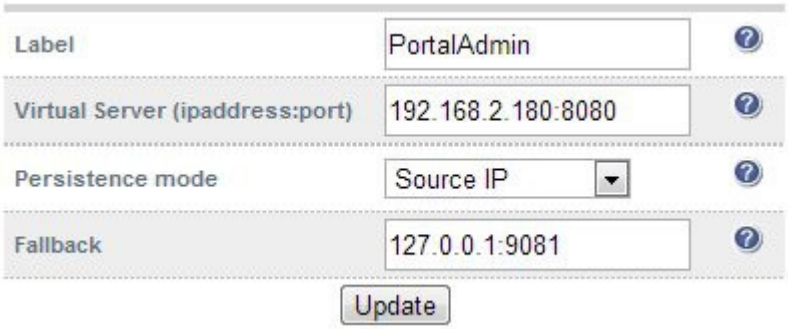
- v7.5 & later – Go to *Cluster Configuration* > *Layer 7 – Virtual Services* and click **[Add a New Virtual Service]**
- v7.3.2 – v7.4.3 – Go to *Edit Configuration* > *Layer 7 – Virtual Server* and click **[Add a New Virtual Server]**
- Enter the following details:



- Enter an appropriate label for the VIP, e.g. **PortalAdmin**
- Set the *Virtual Service IP address* field to the required IP address, e.g. **192.168.2.180**
- Set the *Virtual Service Ports* field to **8080,8443**
- Set *Persistence mode* to **Source IP**
- Click **Update**
- Now click **[Modify]** next to the newly created VIP
- Change *Layer 7 Protocol* to **Other TCP**
- Set *Balance mode* as required – **Weighted Least Connections** is recommended
- Click **Update**

v6.x

- Using the WUI, go to *Edit Configuration* > *Virtual Servers (HAProxy)* and click **[Add a New Virtual Server]**
- Enter the following details:



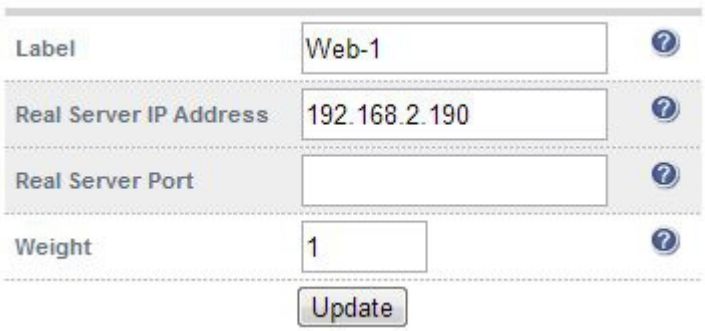
- Enter an appropriate label for the VIP, e.g. **PortalAdmin**
- Change the *Virtual Server (ipaddress:port)* field to <the required IP>:8080, e.g. **192.168.2.180:8080**
- Set *Persistence mode* to **Source IP**
- Click **Update**
- Now click **[Modify]** next to the newly created VIP
- In the *Extra Ports* field enter the additional port, e.g. **8443**
- Change *Layer 7 Protocol* to **Other TCP**
- Set *Balance mode* as required – **Least Connections** is recommended
- Click **Update**

Create the Real Servers (RIPs)

v7.x

- v7.5 & later – Go to *Cluster Configuration* > *Layer 7 – Real Servers* and click **[Add a New Real Server]** next to the newly created Virtual Service
- v7.3.2 – v7.4.3 – Go to *Edit Configuration* > *Layer 7 – Real Servers* and click **[Add a new Real Server]** next to the newly created Virtual Server

- Enter the following details:



- Enter an appropriate label for the RIP , e.g. **Web-1**
- Change the *Real Server IP Address* field to the required IP address , e.g. **192.168.2.190**
- Leave the *Real Server Port* field blank
- Click **Update**
- Repeat the above steps to add your other Web Front End Servers

v6.x

- Using the WUI, go to *Edit Configuration* > *Real Servers (HAProxy)* and click **[Add a new Real Server]** next to the newly created VIP
- Enter the following details:

- Enter an appropriate label for the RIP, e.g. **Web-1**
- Change the *Real Server (ipaddress:port)* field as required (leaving the port blank) e.g. **192.168.2.190**
- Click **Update**
- Repeat the above steps to add your other Web Front End Servers

NOTE: Because SNAT is a full proxy, any server in the cluster can be on any accessible subnet including across the Internet or WAN

STEP3 – Configure the Load balanced User Portal Site

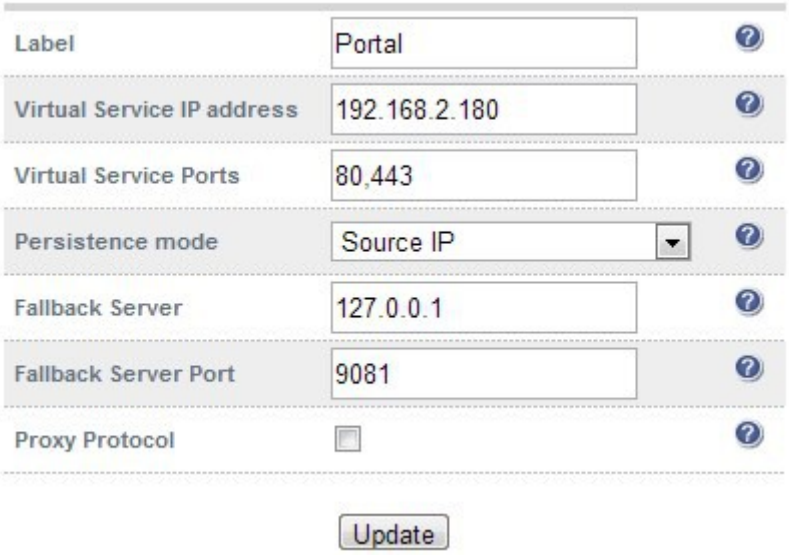
Create the Virtual Server/Service (VIP)

This VIP is used to provide access to the User Portal website on ports 80 & 443.

v7.x

NOTE: Prior to v7.5 a VIP is known as a 'Virtual Server', from v7.5 onwards it's known as a 'Virtual Service'. For simplicity the configuration steps below refer to 'Virtual Service' for both.

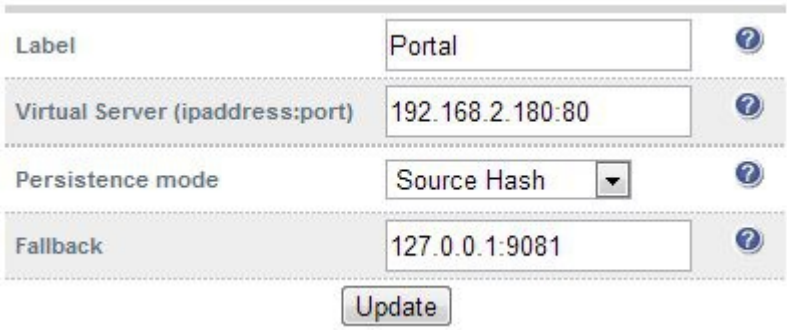
- v7.5 & later – Go to *Cluster Configuration* > *Layer 7 – Virtual Services* and click **[Add a New Virtual Service]**
- v7.3.2 – v7.4.3 – Go to *Edit Configuration* > *Layer 7 – Virtual Server* and click **[Add a New Virtual Server]**
- Enter the following details:



- Enter an appropriate label for the VIP, e.g. **Portal**
- Set the *Virtual Service IP address* field to the required IP address, e.g. **192.168.2.180**
- Set the *Virtual Service Ports* field to **80,443**
- Set *Persistence mode* to **Source IP**
- Click **Update**
- Now click **[Modify]** next to the newly created VIP
- Change *Layer 7 Protocol* to **Other TCP**
- Set *Balance mode* as required – **Weighted Least Connections** is recommended
- Click **Update**

v6.x

- Using the WUI, go to *Edit Configuration* > *Virtual Servers (HAProxy)* and click **[Add a New Virtual Server]**
- Enter the following details:



- Enter an appropriate label for the VIP, e.g. **Portal**
- Change the *Virtual Server (ipaddress:port)* field to <the required IP>:8080, e.g. **192.168.2.180:80**
- Set *Persistence mode* to **Source IP**
- Click **Update**
- Now click **[Modify]** next to the newly created VIP
- In the *Extra Ports* field enter the additional port, e.g. **443**
- Change *Layer 7 Protocol* to **Other TCP**
- Set *Balance mode* as required – **Least Connections** is recommended
- Click **Update**

Create the Real Servers (RIPs)

v7.x

- v7.5 & later – Go to *Cluster Configuration* > *Layer 7 – Real Servers* and click **[Add a New Real Server]** next to the newly created Virtual Service
- v7.3.2 – v7.4.3 – Go to *Edit Configuration* > *Layer 7 – Real Servers* and click **[Add a new Real Server]** next to the newly created Virtual Server

- Enter the following details:

- Enter an appropriate label for the RIP, e.g. **Web-1**
- Change the *Real Server IP Address* field to the required IP address, e.g. **192.168.2.190**
- Leave the *Real Server Port* field blank
- Click **Update**
- Repeat the above steps to add your other Web Front End Servers

v6.x

- Using the WUI, go to *Edit Configuration* > *Real Servers (HAProxy)* and click **[Add a new Real Server]** next to the newly created VIP
- Enter the following details:

- Enter an appropriate label for the RIP, e.g. **Web-1**
- Change the *Real Server (ipaddress:port)* field as required (leaving the port blank) e.g. **192.168.2.190**
- Click **Update**
- Repeat the above steps to add your other Web Front End Servers

NOTE: Because SNAT is a full proxy, any server in the cluster can be on any accessible subnet including across the Internet or WAN

STEP 4 – Finalizing the Configuration

To apply the new settings for the Layer 7 based VIPs, HAProxy must be restarted as follows:

v7.x

- Go to *Maintenance* > *Restart Services* and click **Restart HAProxy**

v6.x

- Go to *Maintenance* > *Restart HAProxy (Hard restart)*

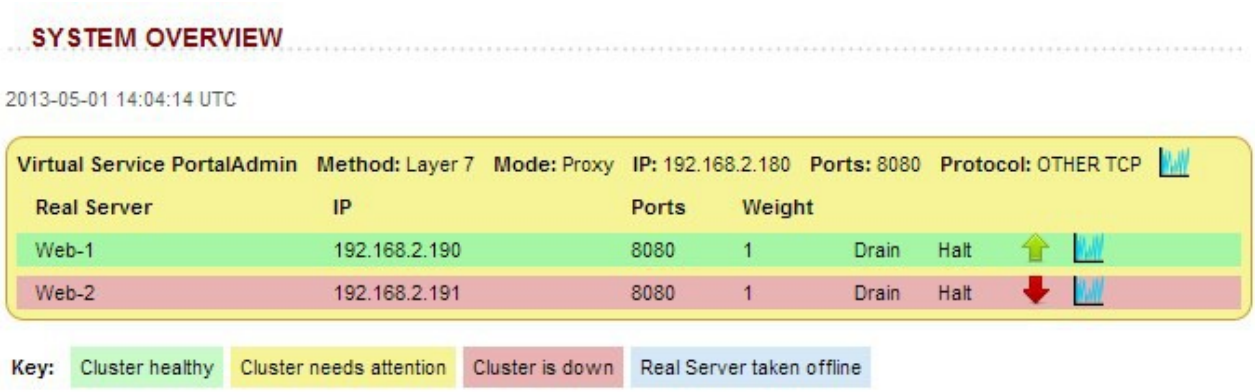
Testing & Validation

It's important to verify that the load balancer is working as expected. Network cables on the Front-End Web Servers can be removed to simulate a sever failure.

The System Overview in the WUI can then be used to check that the server has been marked down (colored red). Also, when the cable is plugged back in, the server should return to normal status (colored green).

Alternatively, IIS can be used to stop a website on one of the web servers. For example, stopping the Central Administration site on Web-2 will cause system overview to mark Portal-Admin / Web-2 as down as shown below:

(the image shows v7.5)



PortalAdmin / Web-1 is still healthy, so all requests will now be routed here.

The System Overview also enables the servers to be taken offline using the Drain and Halt options. The enables servers to be removed from the cluster to perform maintenance tasks etc. Once again, requests will then only be sent to the remaining operational server.

Technical Support

For more details or assistance with your deployment please don't hesitate to contact the support team:

support@loadbalancer.org

Conclusion

Loadbalancer.org appliances provide a very cost effective solution for highly available load balanced Sharepoint 2010 environments.

Appendix

1 – Clustered Pair Configuration – Adding a Slave Unit

If you initially configured just the master unit and now need to add a slave, please refer the section 'Adding a slave unit after the master has been configured' in the v7.x administration manual which is available at the following link: http://www.loadbalancer.org/pdf/loadbalanceradministrationv7.pdf

For v6.x the procedure is similar although there is no system status bar that displays the unit and interface status as in v7.x.

Don't hesitate to contact our support team if you need any further assistance: support@loadbalancer.org