

# Load Balancing HP Anyware

Version 1.0.0



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# 1. About this Brief

This brief outlines the steps required to configure a load balanced HP Anyware environment utilizing Loadbalancer.org appliances. It covers the configuration of the load balancers and also any HP Anyware configuration changes that are required to enable load balancing.

For more information about initial appliance deployment, network configuration and using the Web User Interface (WebUI), please also refer to the [Administration Manual](#).

## 2. Loadbalancer.org Appliances Supported

All our products can be used with HP Anyware. For full specifications of available models please refer to <https://www.loadbalancer.org/products>.

Some features may not be available or fully supported in all cloud platforms due to platform specific limitations. For more details, please refer to the "Main Differences to our Standard (Non-Cloud) Product" section in the appropriate cloud platform [Quick Start Guide](#) or check with Loadbalancer.org support.

## 3. Software Versions Supported

### 3.1. Loadbalancer.org Appliance

- V8.9.1 and later

#### Note

The screenshots used throughout this document aim to track the latest Loadbalancer.org software version. If you're using an older version, or the very latest, the screenshots presented here may not match your WebUI exactly.

### 3.2. HP Anyware

- All versions

## 4. HP Anyware

HP Anyware (formerly known as Teradici) makes it possible to securely deliver high-performance desktops to knowledge workers and power users, even when using the most graphics-intensive applications. HP Anyware is built on the industry-leading PCoIP (PC-over-IP) proprietary remote desktop protocol, empowering a rich user-experience and the flexibility to deliver desktops from any public cloud or data center to a variety of endpoint devices.

## 5. Load Balancing HP Anyware

#### Note

It's highly recommended that you have a working HP Anyware environment first before implementing the load balancer.



## 5.1. Persistence (aka Server Affinity)

HP Anyware requires source IP address-based session affinity at the load balancing layer to ensure that a client sticks to the same Anyware Connector. This is enabled by default.

## 5.2. Virtual Service (VIP) Requirements

To provide load balancing and HA for HP Anyware, a single VIP is required:

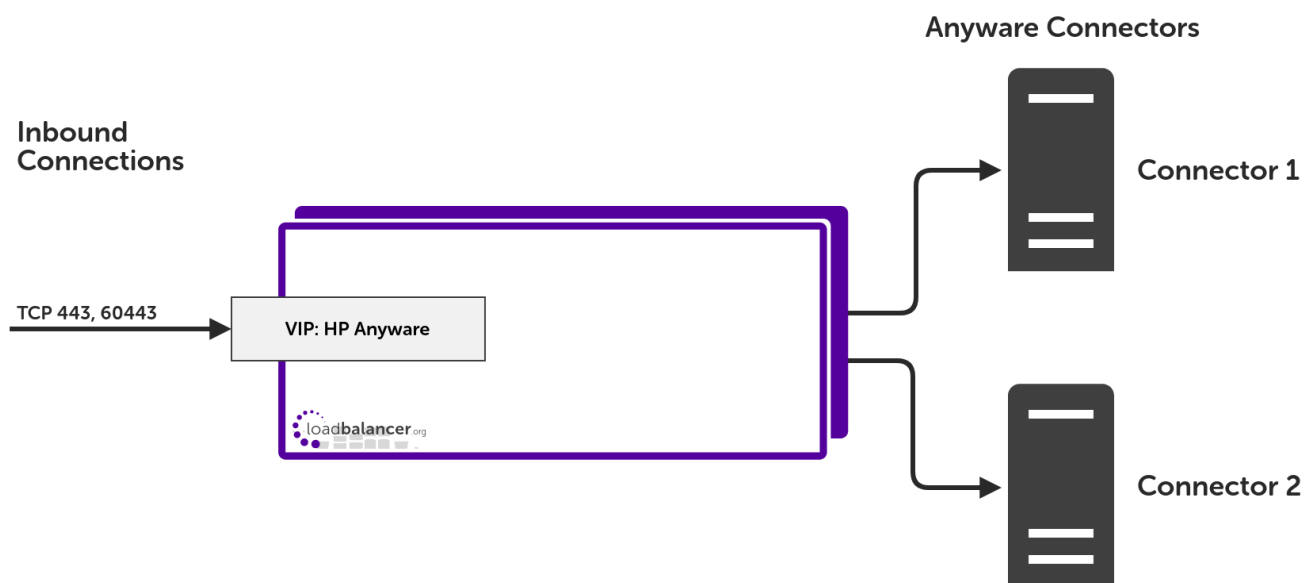
- HP Anyware (for session establishment)

## 5.3. Port Requirements

The following table shows the ports that are load balanced:

Ports	Protocols	Use
443, 60443	TCP/HTTPS	PCoIP Session Establishment

# 6. Deployment Concept



VIP = **V**irtual **I**P Address

### Note

The load balancer can be deployed as a single unit, although Loadbalancer.org recommends a clustered pair for resilience & high availability. Please refer to the section [Configuring HA - Adding a Secondary Appliance](#) in the appendix for more details on configuring a clustered pair.

# 7. Load Balancer Deployment Methods

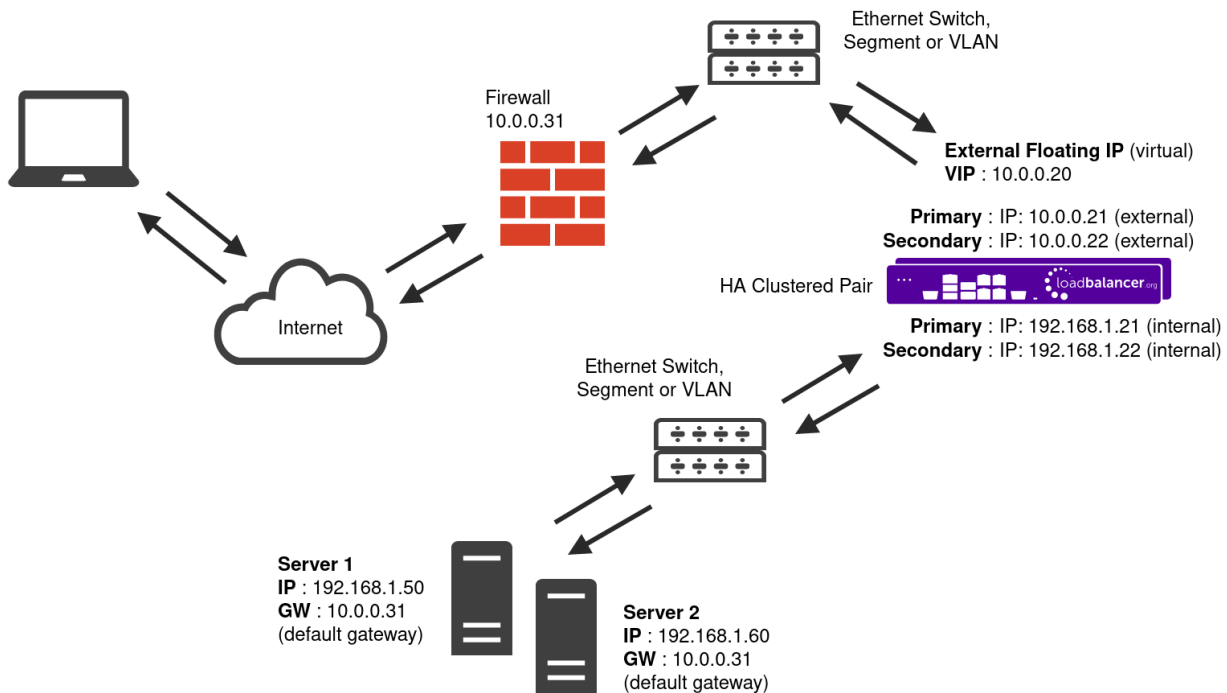
The load balancer can be deployed in 4 fundamental ways: *Layer 4 DR mode*, *Layer 4 NAT mode*, *Layer 4 SNAT mode*, and *Layer 7 SNAT mode*.

For HP Anyware, using layer 4 SNAT mode is recommended. This mode is described below and is used for the

configuration presented in this guide. For configuring using SNAT mode please refer to [Section 10, "Appliance Configuration for HP Anyware"](#).

## 7.1. Layer 4 SNAT Mode

Layer 4 SNAT mode is a high performance solution, although not as fast as Layer 4 NAT mode or Layer 4 DR mode.



- The load balancer translates all requests from the external Virtual Service to the internal Real Servers in the same way as NAT mode - please refer to [Layer 4 NAT Mode](#) for more information.
- Layer 4 SNAT mode is not transparent, an iptables SNAT rule translates the source IP address to be the load balancer rather than the original client IP address.
- Layer 4 SNAT mode can be deployed using either a one-arm or two-arm configuration. For two-arm deployments, **eth0** is normally used for the internal network and **eth1** is used for the external network although this is not mandatory.
- If the Real Servers require Internet access, **Auto-NAT** should be enabled using the WebUI option: **Cluster Configuration > Layer 4 - Advanced Configuration**, the external interface should be selected.
- Requires no mode-specific configuration changes to the load balanced Real Servers.
- Port translation is possible with Layer 4 SNAT mode, e.g. VIP:80 → RIP:8080 is supported.
- You should not use the same RIP:PORT combination for layer 4 SNAT mode VIPs and layer 7 SNAT mode VIPs because the required firewall rules conflict.

## 8. Configuring HP Anyware for Load Balancing

### (!) Important

For external client connections to work, each HP Anyware Connector **must** have a unique public IP address and it **must** be externally routable. Port 4172 **must** be open at the address.



## 9. Loadbalancer.org Appliance – the Basics

### 9.1. Virtual Appliance

A fully featured, fully supported 30 day trial is available if you are conducting a PoC (Proof of Concept) deployment. The VA is currently available for VMware, Virtual Box, Hyper-V, KVM, XEN and Nutanix AHV and has been optimized for each Hypervisor. By default, the VA is allocated 2 vCPUs, 4GB of RAM and has a 20GB virtual disk. The Virtual Appliance can be downloaded [here](#).

#### Note

The same download is used for the licensed product, the only difference is that a license key file (supplied by our sales team when the product is purchased) must be applied using the appliance's WebUI.

#### Note

Please refer to [Virtual Appliance Installation](#) and the ReadMe.txt text file included in the VA download for additional information on deploying the VA using the various Hypervisors.

#### Note

The VA has 4 network adapters. For VMware only the first adapter (**eth0**) is connected by default. For HyperV, KVM, XEN and Nutanix AHV all adapters are disconnected by default. Use the network configuration screen within the Hypervisor to connect the required adapters.

### 9.2. Initial Network Configuration

After boot up, follow the instructions on the appliance console to configure the management IP address, subnet mask, default gateway, DNS servers and other network and administrative settings.

#### Important

Be sure to set a secure password for the load balancer, when prompted during the setup routine.

### 9.3. Accessing the Appliance WebUI

The WebUI is accessed using a web browser. By default, users are authenticated using Apache authentication. Users can also be authenticated against LDAP, LDAPS, Active Directory or Radius - for more information, please refer to [External Authentication](#).

#### Note

There are certain differences when accessing the WebUI for the cloud appliances. For details, please refer to the relevant [Quick Start / Configuration Guide](#).

1. Using a browser, navigate to the following URL:

**<https://<IP-address-configured-during-the-network-setup-wizard>:9443/lbadmin/>**

#### Note

You'll receive a warning about the WebUI's SSL certificate. This is due to the default self signed certificate that is used. If preferred, you can upload your own certificate - for more information, please refer to [Appliance Security Features](#).

#### Note

If you need to change the port, IP address or protocol that the WebUI listens on, please



refer to [Service Socket Addresses](#).

- Log in to the WebUI using the following credentials:

**Username:** loadbalancer

**Password:** <configured-during-network-setup-wizard>



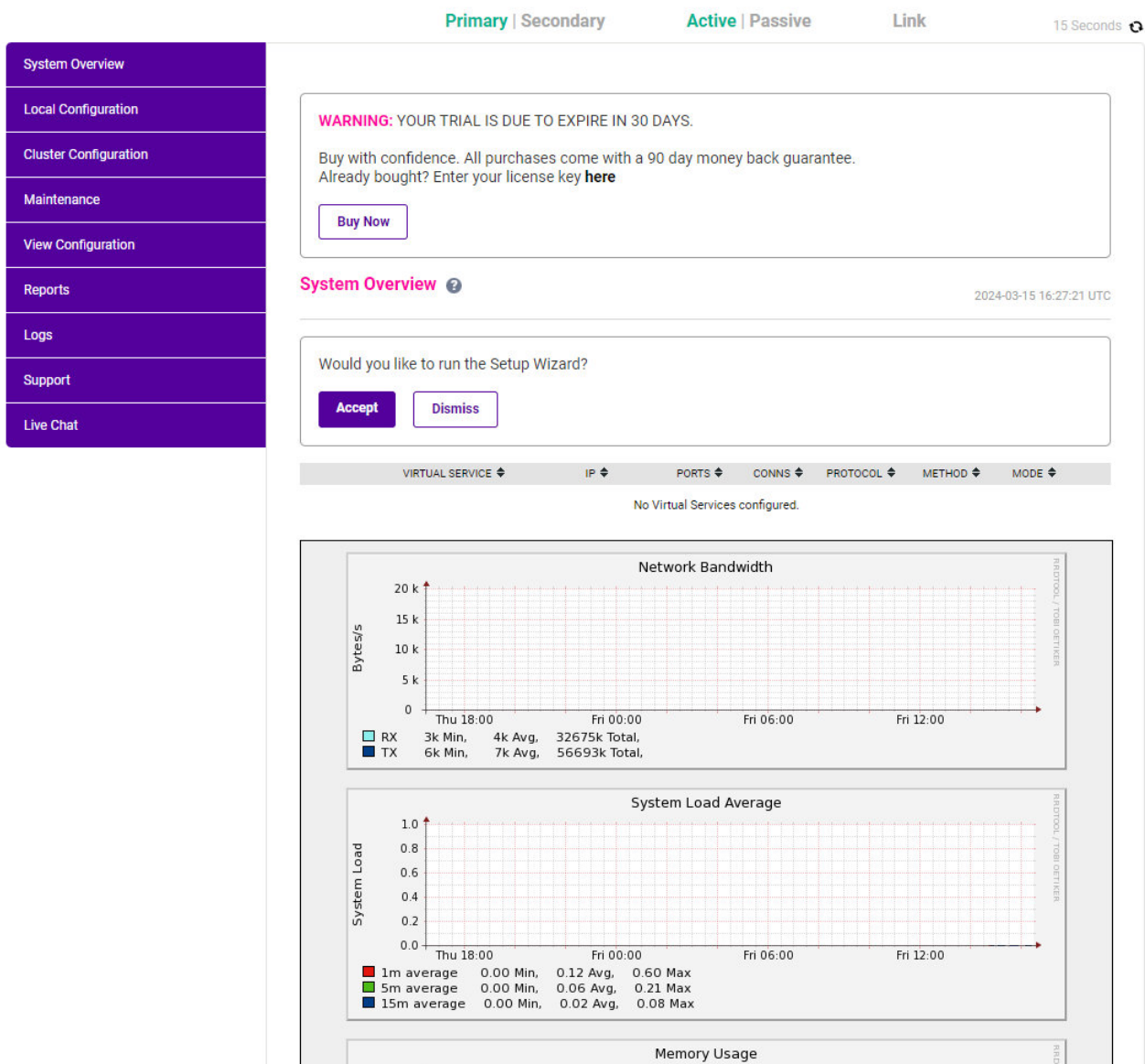
#### Note

To change the password, use the WebUI menu option: **Maintenance > Passwords**.

Once logged in, the WebUI will be displayed as shown below:

LOADBALANCER

Enterprise VA Max



- You'll be asked if you want to run the Setup Wizard which can be used to configure layer 7 services. Click **Dismiss** if you're following a guide or want to configure the appliance manually or click **Accept** to start the wizard.



## Main Menu Options

**System Overview** - Displays a graphical summary of all VIPs, RIPs and key appliance statistics

**Local Configuration** - Configure local host settings such as IP address, DNS, system time etc.

**Cluster Configuration** - Configure load balanced services such as VIPs & RIPs

**Maintenance** - Perform maintenance tasks such as service restarts and taking backups

**View Configuration** - Display the saved appliance configuration settings

**Reports** - View various appliance reports & graphs

**Logs** - View various appliance logs

**Support** - Create a support download, contact the support team & access useful links

**Live Chat** - Start a live chat session with one of our Support Engineers

## 9.4. Appliance Software Update

To ensure that the appliance(s) are running the latest software version, we recommend a software update check is performed.

### Determining the Current Software Version

The software version is displayed at the bottom of the WebUI as shown in the example below:

Copyright © Loadbalancer.org Inc. 2002 – 2024  
ENTERPRISE VA Max - v8.11.1

English ▼

### Checking for Updates using Online Update

#### Note

By default, the appliance periodically contacts the Loadbalancer.org update server and checks for updates. An update check can also be manually triggered as detailed below.

1. Using the WebUI, navigate to: **Maintenance > Software Update**.
2. Select **Online Update**.
3. If the latest version is already installed, a message similar to the following will be displayed:

**Information:** Version v8.11.1 is the current release. No updates are available

4. If an update is available, you'll be presented with a list of new features, improvements, bug fixes and security related updates.
5. Click **Online Update** to start the update process.

#### Note

Do not navigate away whilst the update is ongoing, this may cause the update to fail.

6. Once complete (the update can take several minutes depending on download speed and upgrade version) the following message will be displayed:





**Information:** Update completed successfully.

- If services need to be reloaded/restarted or the appliance needs a full restart, you'll be prompted accordingly.

## Using Offline Update

If the load balancer does not have access to the Internet, offline update can be used.

### Note

Please contact [support@loadbalancer.org](mailto:support@loadbalancer.org) to check if an update is available and obtain the latest offline update files.

To perform an offline update:

- Using the WebUI, navigate to: **Maintenance > Software Update**.
- Select **Offline Update**.
- The following screen will be displayed:

### Software Update

#### Offline Update

The following steps will lead you through offline update.

- Contact **Loadbalancer.org support** to obtain the offline update archive and checksum.
- Save the archive and checksum to your local machine.
- Select the archive and checksum files in the upload form below.
- Click *Upload and Install* to begin the update process.

Archive:  No file chosen

Checksum:  No file chosen

- Select the *Archive* and *Checksum* files.
- Click **Upload and Install**.
- If services need to be reloaded/restarted or the appliance needs a full restart, you'll be prompted accordingly.

## 9.5. Ports Used by the Appliance

By default, the appliance uses the following TCP & UDP ports:

Protocol	Port	Purpose
TCP	22 *	SSH
TCP & UDP	53 *	DNS / GSLB
TCP & UDP	123	NTP



Protocol	Port	Purpose
TCP & UDP	161 *	SNMP
UDP	6694	Heartbeat between Primary & Secondary appliances in HA mode
TCP	7778	HAProxy persistence table replication
TCP	9000 *	Gateway service (Centralized/Portal Management)
TCP	9080 *	WebUI - HTTP (disabled by default)
TCP	9081 *	Nginx fallback page
TCP	9443 *	WebUI - HTTPS
TCP	25565 *	Shuttle service (Centralized/Portal Management)

### Note

The ports used for SSH, GSLB, SNMP, the WebUI, the fallback page, the gateway service and the shuttle service can be changed if required. For more information, please refer to [Service Socket Addresses](#).

## 9.6. HA Clustered Pair Configuration

Loadbalancer.org recommend that load balancer appliances are deployed in pairs for high availability. In this guide a single unit is deployed first, adding a secondary unit is covered in the section [Configuring HA - Adding a Secondary Appliance](#) of the appendix.

# 10. Appliance Configuration for HP Anyware

## 10.1. Configuring the Virtual Service (VIP)

1. Using the web user interface, navigate to *Cluster Configuration > Layer 4 – Virtual Services* and click on **Add a new Virtual Service**.
2. Define the *Label* for the virtual service as required, e.g. **HP Anyware**.
3. Set the *Virtual Service IP Address* field to the required IP address, e.g. **192.168.85.140**.
4. Set the *Ports* field to **443,60443**.
5. Leave the *Protocol* set to **TCP**.
6. Leave the *Forwarding Method* set to **SNAT**.
7. Click **Update** to create the virtual service.



#### Layer 4 - Add a new Virtual Service

Virtual Service		
Label	<input type="text" value="HP Anyware"/>	<a href="#">?</a>
IP Address	<input type="text" value="192.168.85.140"/>	<a href="#">?</a>
Ports	<input type="text" value="443,60443"/>	<a href="#">?</a>
Protocol		
Protocol	<input type="text" value="TCP"/>	<a href="#">?</a>
Forwarding		
Forwarding Method	<input type="text" value="SNAT"/>	<a href="#">?</a>
		<input type="button" value="Cancel"/> <input type="button" value="Update"/>

## 10.2. Defining the Real Servers (RIPs)

1. Using the web user interface, navigate to *Cluster Configuration > Layer 4 – Real Servers* and click on **Add a new Real Server** next to the newly created VIP.
2. Define the *Label* for the real server as required, e.g. **Anyware Conn 1**.
3. Set the *Real Server IP Address* field to the required IP address, e.g. **192.168.85.200**.
4. Click *Update*.
5. Repeat these steps to add the remaining Anyware Connectors.

#### Layer 4 Add a new Real Server - HP\_Anyware

Label	<input type="text" value="Anyware Conn 1"/>	<a href="#">?</a>
Real Server IP Address	<input type="text" value="192.168.85.200"/>	<a href="#">?</a>
Real Server Port	<input type="text"/>	<a href="#">?</a>
Weight	<input type="text" value="100"/>	<a href="#">?</a>
Minimum Connections	<input type="text" value="0"/>	<a href="#">?</a>
Maximum Connections	<input type="text" value="0"/>	<a href="#">?</a>
		<input type="button" value="Cancel"/> <input type="button" value="Update"/>

## 11. Testing & Verification

### Note

For additional guidance on diagnosing and resolving any issues you may have, please also refer to [Diagnostics & Troubleshooting](#).

### 11.1. Client Connection Test

#### Internal Client

If applicable for the deployment in question, use an *internal* client and test connecting to the HP Anyware service



via the new virtual service on the load balancer. Verify that the client can connect successfully.

## External Client




If applicable for the deployment in question, use an **external** client and test connecting to the HP Anyware service via the new virtual service on the load balancer. Verify that the client can connect successfully.

## 11.2. Using System Overview

The System Overview can be viewed in the WebUI. It shows a graphical view of all VIPs & RIPs (i.e. the HP Anyware Connectors) and shows the state/health of each server as well as the state of the cluster as a whole. The example below shows a standard deployment where both HP Anyware Connectors are healthy and available to accept connections:

### System Overview ?

2023-09-22 13:48:51 UTC

VIRTUAL SERVICE ⚙		IP ⚙	PORTS ⚙	CONNS ⚙	PROTOCOL ⚙	METHOD ⚙	MODE ⚙	
↑	HP_Anyware	192.168.85.140	443,60443	0	TCP	Layer 4	SNAT	
REAL SERVER		IP	PORTS	WEIGHT	CONNS			
↑	Anyware Conn 1	192.168.85.200	443,60443	100	0	Drain	Halt	
↑	Anyware Conn 2	192.168.85.201	443,60443	100	0	Drain	Halt	

## 12. Technical Support

For more details about configuring the appliance and assistance with designing your deployment please don't hesitate to contact the support team using the following email address: [support@loadbalancer.org](mailto:support@loadbalancer.org).

## 13. Further Documentation

### 13.1. Further Information from HP

For further information from HP about load balancing HP Anyware, refer to the following location:

[https://teradici.com/web-help/pcoip/anyware-architecture-guide/2022.07/connection\\_models/load\\_balancer\\_solutions/](https://teradici.com/web-help/pcoip/anyware-architecture-guide/2022.07/connection_models/load_balancer_solutions/)

### 13.2. Loadbalancer.org Appliance Documentation

For additional information, please refer to the [Administration Manual](#).



## 14. Appendix

### 14.1. Configuring HA - Adding a Secondary Appliance

Our recommended configuration is to use a clustered HA pair of load balancers to provide a highly available and resilient load balancing solution. We recommend that the Primary appliance is fully configured first, then the Secondary appliance can be added to create an HA pair. Once the HA pair is configured, load balanced services must be configured and modified on the Primary appliance. The Secondary appliance will be automatically kept in sync.

#### Note

For Enterprise Azure, the HA pair should be configured first. For more information, please refer to the Azure Quick Start/Configuration Guide available in the [documentation library](#)

The clustered HA pair uses Heartbeat to determine the state of the other appliance. Should the active device (normally the Primary) suffer a failure, the passive device (normally the Secondary) will take over.

#### Non-Replicated Settings

A number of settings are not replicated as part of the Primary/Secondary pairing process and therefore must be manually configured on the Secondary appliance. These are listed by WebUI menu option in the table below:

WebUI Main Menu Option	Sub Menu Option	Description
Local Configuration	Hostname & DNS	Hostname and DNS settings
Local Configuration	Network Interface Configuration	Interface IP addresses, bonding configuration and VLANs
Local Configuration	Routing	Default gateways and static routes
Local Configuration	System Date & time	Time and date related settings
Local Configuration	Physical – Advanced Configuration	Various appliance settings
Local Configuration	Portal Management	Portal management settings
Local Configuration	Security	Security settings
Local Configuration	SNMP Configuration	SNMP settings
Local Configuration	Graphing	Graphing settings
Local Configuration	License Key	Appliance licensing
Maintenance	Backup & Restore	Local XML backups
Maintenance	Software Updates	Appliance software updates
Maintenance	Fallback Page	Fallback page configuration
Maintenance	Firewall Script	Firewall (iptables) configuration
Maintenance	Firewall Lockdown Wizard	Appliance management lockdown settings

### ⚠ Important

Make sure that where any of the above have been configured on the Primary appliance, they're also configured on the Secondary.


## Configuring the HA Clustered Pair

### 📌 Note

If you have already run the firewall lockdown wizard on either appliance, you'll need to ensure that it is temporarily disabled on both appliances whilst performing the pairing process.

1. Deploy a second appliance that will be the Secondary and configure initial network settings.
2. Using the WebUI on the Primary appliance, navigate to: **Cluster Configuration > High-Availability Configuration**.

### Create a Clustered Pair

 **LOADBALANCER**

**Local IP address**


**IP address of new peer**

**Password for *loadbalancer* user on peer**

**Add new node**


3. Specify the IP address and the *loadbalancer* user's password for the Secondary (peer) appliance as shown in the example above.
4. Click **Add new node**.
5. The pairing process now commences as shown below:

### Create a Clustered Pair

 **LOADBALANCER** **Primary**

IP: 192.168.110.40

Attempting to pair..

 **LOADBALANCER** **Secondary**

IP: 192.168.110.41

**Local IP address**

**IP address of new peer**


**Password for *loadbalancer* user on peer**


configuring

6. Once complete, the following will be displayed on the Primary appliance:





## High Availability Configuration - primary

 **LOADBALANCER**

 **Primary**

IP: 192.168.110.40

 **LOADBALANCER**

 **Secondary**

IP: 192.168.110.41

**Break Clustered Pair**

- To finalize the configuration, restart heartbeat and any other services as prompted in the "Commit changes" message box at the top of the screen.

### Note

Clicking the **Restart Heartbeat** button on the Primary appliance will also automatically restart heartbeat on the Secondary appliance.

### Note

For more details on configuring HA with 2 appliances, please refer to [Appliance Clustering for HA](#).

### Note

For details on testing and verifying HA, please refer to [Clustered Pair Diagnostics](#).

# 15. Document Revision History

Version	Date	Change	Reason for Change	Changed By
1.0.0	22 September 2023	Initial version		AG, AH







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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.

