



Appliance Quick Start Guide

Version 8.6.3 Revision 1.0.0



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1. About this Guide

This quick start guide provides enough information to deploy the appliance, configure a simple load balanced test environment and test and verify its functionality.

Note

Please also refer to the [Administration Manual](#) for much more detailed information on setting up the appliance and configuring a load balancing solution. For information on configuring the appliance for specific applications, please refer to our extensive library of [Deployment Guides](#).

2. Appliance Configuration Overview

Initial network configuration is carried out at the console using the Network Setup Wizard. Once an IP address has been allocated, load balanced services can be configured using the WebUI; either using the Setup Wizard (for Layer 7 services) or by manually defining the Virtual Services (VIPs) and associated Real Servers (RIPs).

By default, the WebUI is accessible on HTTPS port **9443**, this can be changed if required. For more information please refer to the "Appliance Security" section below.

We always recommend that where possible two appliances are deployed as a clustered pair for high availability and resilience, this avoids introducing a single point of failure to your network.

We recommend that the Primary appliance should be fully configured first, then the Secondary appliance should be added to create an HA pair. Once the HA pair is configured, load balanced services will be automatically synchronized from the Primary to Secondary appliance. Load balanced services should then be configured & modified on the Primary appliance and the Secondary will be automatically kept in sync. More information on configuring an HA pair can be found in the section [Configuring HA - Adding a Secondary Appliance](#).

3. Appliance Security

Note

For full details of all security related features, please refer to [Appliance Security Features](#).

Security Mode

To control how the appliance is accessed and which features are enabled, 3 security modes are provided:

- **Secure - (default)** - in this mode:
 - the WebUI is accessible on HTTPS port **9443**. If you attempt to access the WebUI on HTTP port **9080** you will be redirected to HTTPS port **9443**
 - access to the *Local Configuration > Execute shell command* menu option is disabled
 - the ability to edit the firewall script & the lockdown wizard is disabled
 - 'root' user console & SSH password access are disabled
- **Custom** - in this mode, the security options can be configured to suit your requirements
- **Secure - Permanent** - this mode is the same as **Secure** but the change is *irreversible*

Important

Only set the security mode to **Secure - Permanent** if you are 100% sure this is what you want!

To configure the Security Mode:

1. Using the WebUI, navigate to: *Local Configuration > Security*.
2. Select the required *Appliance Security Mode* - if **Custom** is selected, configure the additional options according to your requirements.
3. Configure the *HTTPS Port for Web User Interface*, *Web Interface SSL Certificate* and *Ciphers to use* according to your requirements.
4. Click **Update**.

Passwords

The password for the 'loadbalancer' WebUI user account and the 'root' Linux user account are set during the Network Setup Wizard. These can be changed at any time.

1 - the 'root' Linux account

As explained above, 'root' user console & SSH password access are disabled by default. If enabled, the 'root' password can be changed at the console, or via an SSH session using the following command:

```
# passwd
```

Note

For the AWS and Azure cloud products it's not possible to directly login as root. If root access is required, once you've logged into the console/SSH session using the credentials defined during instance deployment, run the following command:

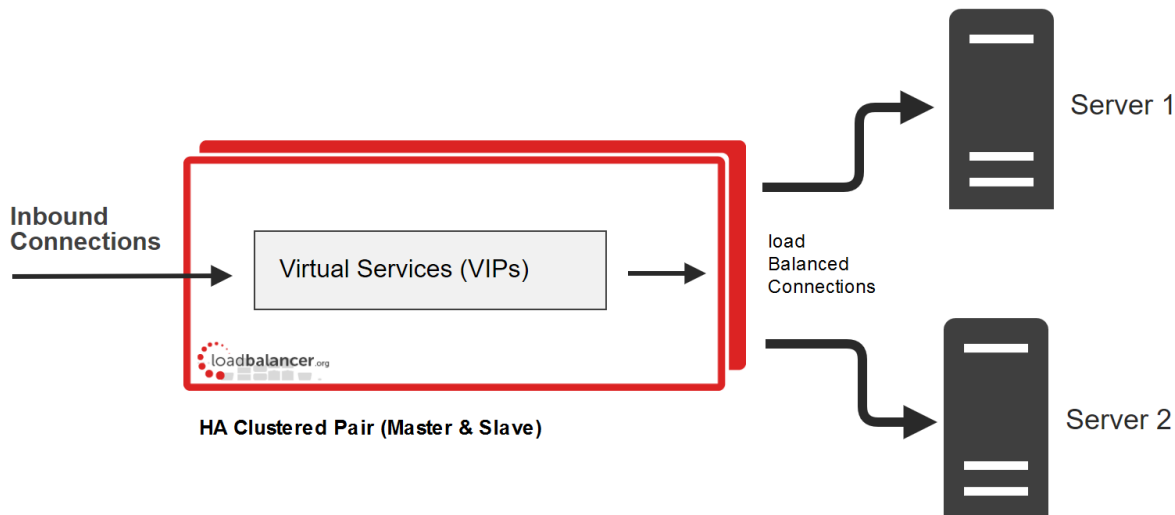
```
$ sudo su
```

2 - the 'loadbalancer' WebUI account

This can be changed using the WebUI menu option: *Maintenance > Passwords*.

4. Deployment Concept

Once deployed, clients connect to the Virtual Service(s) (VIPs) on the load balancer rather than connecting directly to one of the load balanced servers. These connections are then distributed between the load balanced servers according to the load balancing algorithm selected.



Note

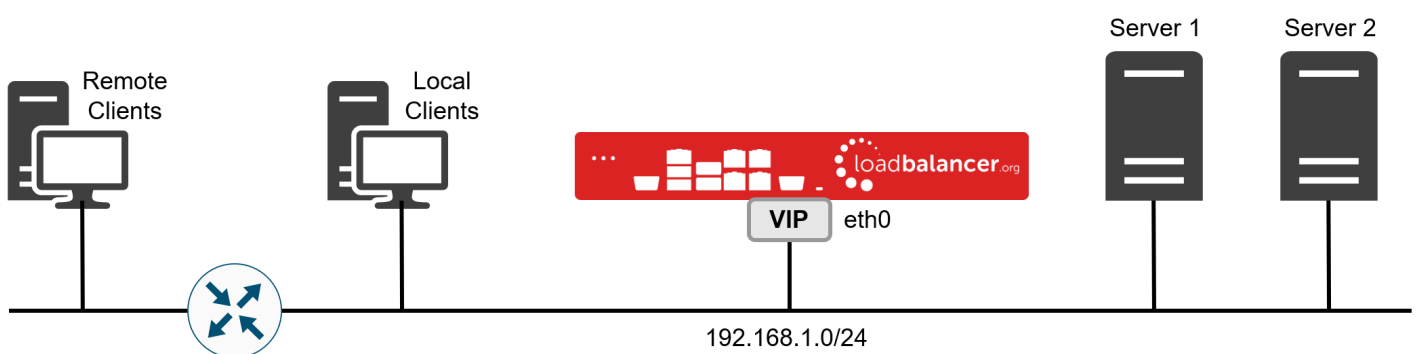
We always recommend that 2 appliances are deployed as an active/passive HA pair. The Secondary appliance automatically takes over if the Primary unit fails. For more information on configuring HA using 2 appliances please refer to [Configuring HA - Adding a Secondary Appliance](#).

5. One-Arm and Two-Arm Topologies

The number of 'arms' is a descriptive term for how many interfaces are used to connect a device to a network. It's common for a load balancer that uses a routing method (NAT) to have a two-arm configuration although one-arm is also supported. Proxy based load balancers (SNAT) commonly use a one-arm configuration although two-arm is also supported.

One-Arm

The VIP and the load balanced servers are located in a single subnet. The load balancer requires a single network interface adapter - eth0 in the diagram below.

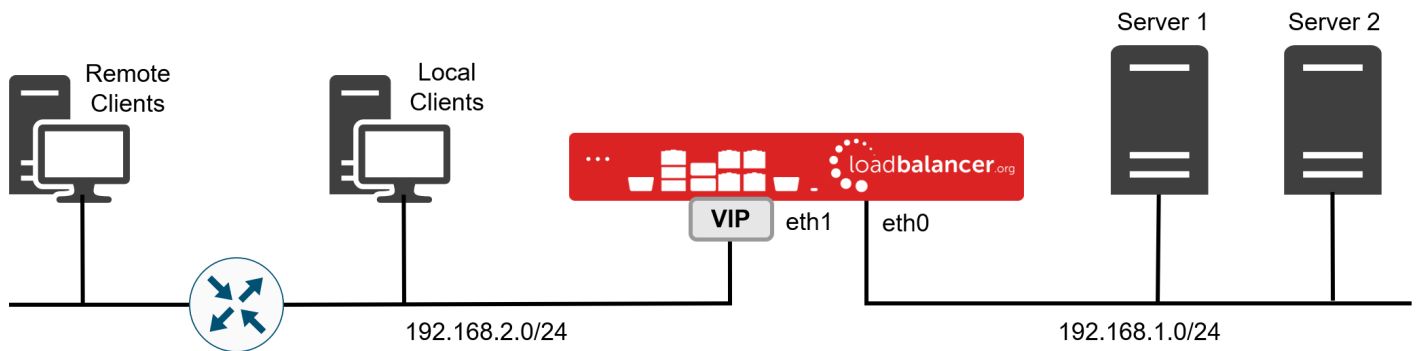


Two-Arm

Here, 2 subnets are used. The VIP is located in one subnet and the load balanced Real Servers are located in the other. The load balancer requires 2 interfaces, one in each subnet as shown in the diagram below.

Note

This can be achieved by using two network adapters, or by creating VLANs on a single adapter.



Note

Typically *eth0* is used as the internal interface and *eth1* is used as the external interface. This is not a requirement - each interface can be used for any purpose.

6. Supported Load Balancing Methods

The Loadbalancer.org appliance is one of the most flexible load balancers available. The design allows different load balancing modules to utilize the core high availability framework of the appliance. Multiple load balancing methods can be used at the same time or in combination with each other. The table below describes the methods supported by the appliance.

Layer	Method	Comments	Topology	Note
Layer 4	DR (Direct Routing)	Ultra-fast local server based load balancing <ul style="list-style-type: none"> Requires the ARP Problem to be solved on each Real Server - for more details please refer to DR Mode Considerations 	One-Arm (*)	1
Layer 4	NAT (Network Address Translation)	Fast Layer 4 load balancing <ul style="list-style-type: none"> The appliance must be the default gateway for the Real Servers 	One or Two-Arm	1
Layer 4	TUN	Similar to DR but works across IP encapsulated tunnels	One-Arm	2
Layer 4	SNAT (Source Network Address Translation)	Fast layer 4 SNAT supporting both TCP & UDP <ul style="list-style-type: none"> Very simple to implement Requires no Real Server configuration changes 	One or Two-Arm	3
Layer 7	SSL Termination (STunnel & Pound)	Usually required in order to process cookie persistence in HTTPS streams on the load balancer <ul style="list-style-type: none"> SSL Termination is processor intensive 	One or Two-Arm	4

Layer	Method	Comments	Topology	Note
Layer 7	SNAT (Source Network Address Translation using HAProxy)	Layer 7 allows greater flexibility including full SNAT and remote server load balancing, cookie insertion and URL switching <ul style="list-style-type: none"> • Very simple to implement • Requires no Real Server configuration changes • Not as fast as Layer 4 methods 	One or Two-Arm	4

(*) DR mode can also be used in a multi-homed configuration where real servers are located in different subnets. In this case, the load balancer must have an interface in the same subnet to enable layer 2 connectivity which is required for DR mode to operate.

Notes

1. Recommended for high performance fully transparent and scalable solutions.
2. Only required for Direct Routing implementation across routed networks (rarely used).
3. Recommended when you want to load balance both TCP and UDP but you're unable to use DR mode or NAT mode due to network topology or Real Server related reasons.
4. Recommended if HTTP cookie persistence is required, also used for several Microsoft applications such as Exchange, Sharepoint & Remote Desktop Services and for overall deployment simplicity since Real Servers can be on any accessible subnet and no Real Server changes are required.

7. 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
TCP & UDP	123	NTP
TCP & UDP	161	SNMP
UDP	6694	Heartbeat between Primary & Secondary appliances in HA mode
TCP	7778	HAProxy persistence table replication
TCP	9080	WebUI - HTTP (disabled by default)
TCP	9081	Nginx fallback page
TCP	9443	WebUI - HTTPS

8. Appliance Deployment

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 [The Virtual Appliance - Hypervisor Deployment](#) and the ReadMe.txt text file included in the VA download for more detailed information on deploying the VA using various Hypervisors.

Note

For the VA, 4 NICs are included but only eth0 is connected by default at power up. If the other NICs are required, these should be connected using the network configuration screen within the Hypervisor.

Hardware Appliance

For details of all hardware models and for information on installing and connecting the appliance, please click [here](#).

Cloud Appliance

AWS

For details of deploying and configuring the Amazon Web Services (AWS) appliance please refer to the [AWS Configuration Guide](#).

Azure

For details of deploying and configuring the Microsoft Azure appliance please refer to the [Azure Configuration Guide](#).

Google Cloud Platform

For details of deploying and configuring the Google Cloud appliance please refer to the [GCP Configuration Guide](#).

9. Configuring Initial Network Settings

After power up, the following startup message is displayed on the appliance console:

```
Welcome to the Loadbalancer.org appliance.

To perform initial network configuration, log in to the console as
Username: setup
Password: setup

To access the web interface and wizard, point your browser at
http://192.168.2.21:9080/
or
https://192.168.2.21:9443/

lbmaster login: _
```

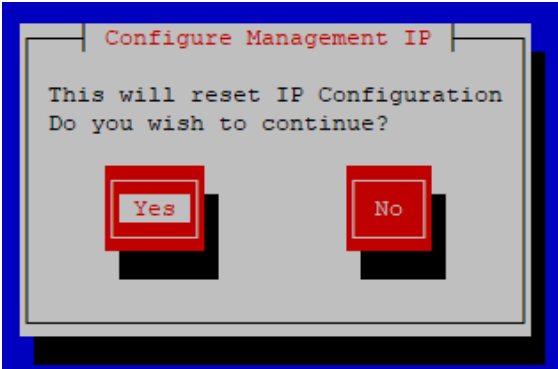

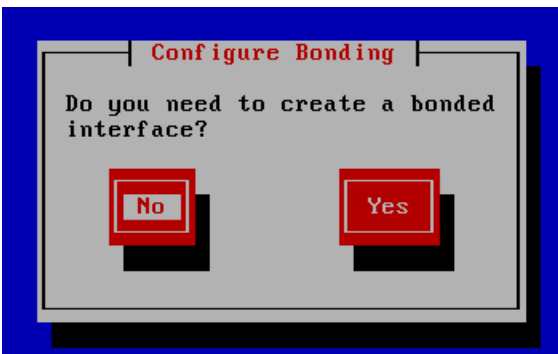

As mentioned in the text, to perform initial network configuration, login as the 'setup' user at the appliance console. Once logged in, the Network Setup Wizard will start automatically.

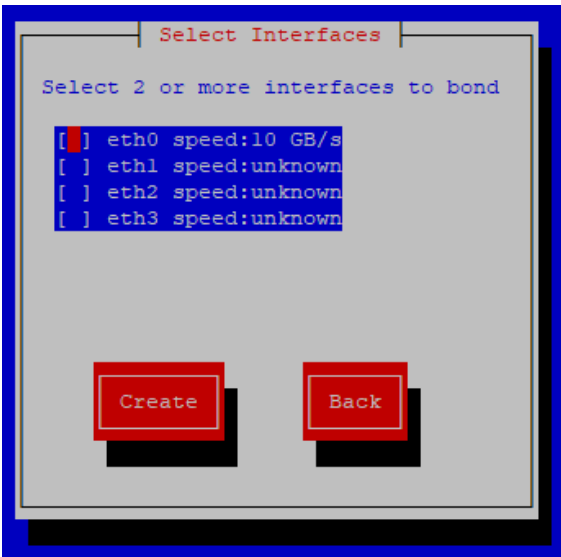

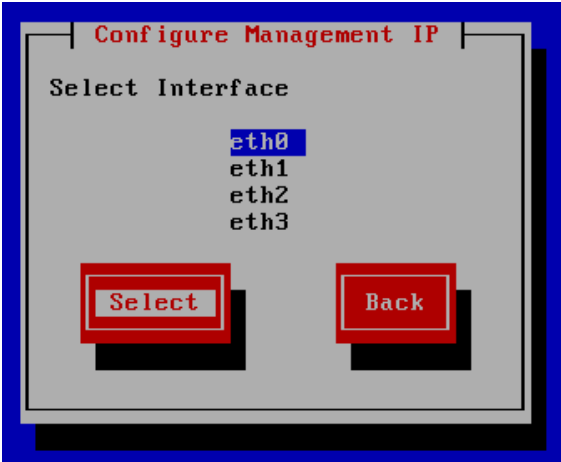

login to the console:

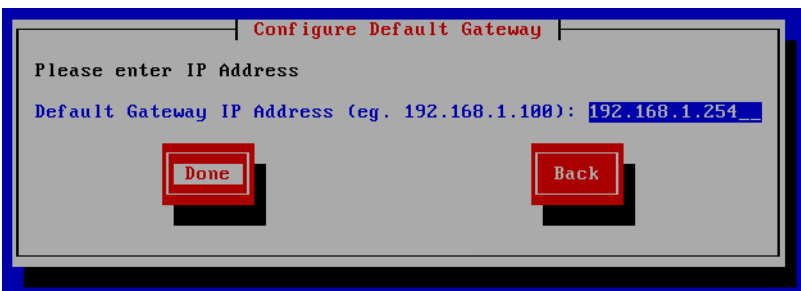
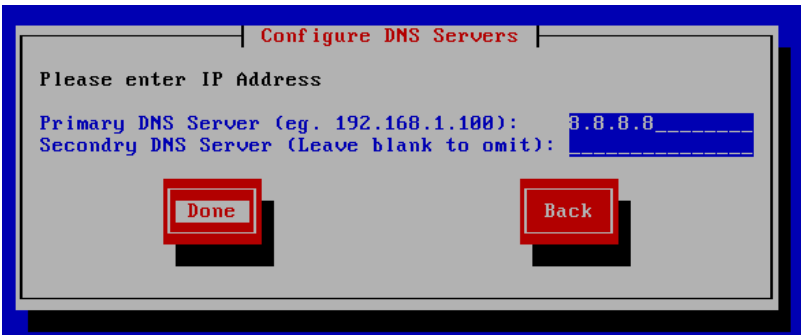
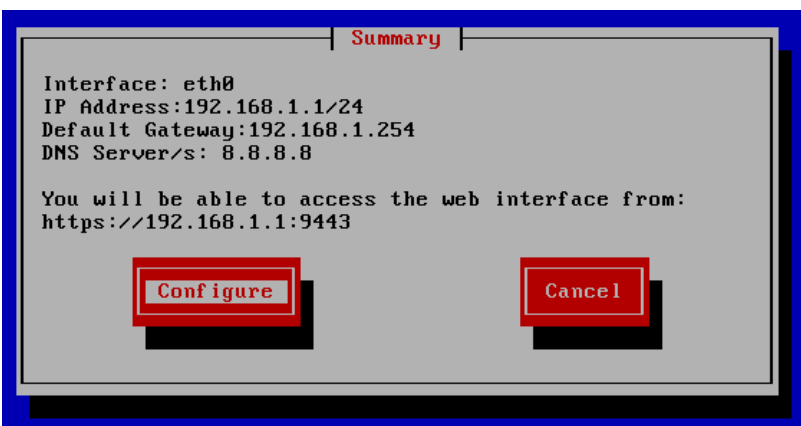

Username: setup


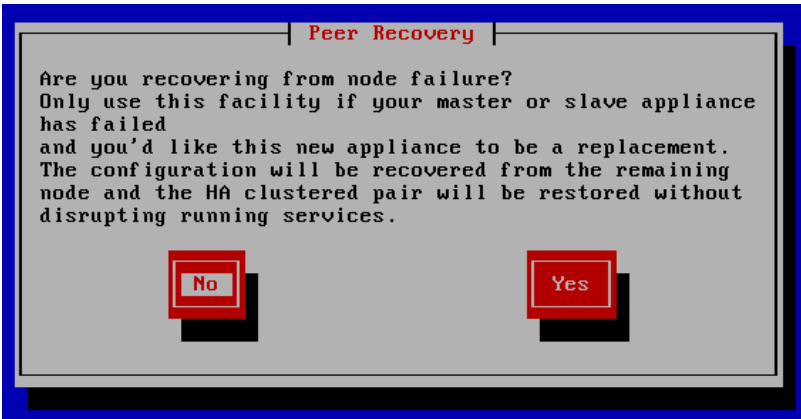
Password: setup

A series of screens will be displayed that allow network settings to be configured:

	<p>To continue with the Network Setup Wizard select Yes and hit <ENTER> to continue.</p>
	<p>A list of available interfaces will be shown, hit <ENTER> to continue.</p>
	<p>Select Yes If you want to configure a bonded interface, if not leave No selected, then hit <ENTER> to continue.</p> <p>If you select Yes, the screen shown below will be displayed:</p>

	<p>Using the space bar, select the interfaces you'd like to include in the bond, then click Create.</p>
	<p>Select Yes if you want to configure a VLAN, if not leave No selected, then hit <ENTER> to continue.</p> <p>If you select Yes you'll be prompted to enter a VLAN Tag ID.</p>
	<p>Select the interface that will be used to manage the appliance, select Select and hit <ENTER> to continue.</p>
	<p>Either enter the required management IP address & CIDR prefix and select Done or select Use DHCP to request an address and then hit <ENTER> to continue.</p> <div data-bbox="986 1704 1458 1888"> <p>Note</p> <p>A subnet mask such as 255.255.255.0 is not valid, in this case enter 24 instead.</p> </div>

	<p>Enter the default gateway address or, select Done and hit <ENTER> to continue.</p>
	<p>Define the required DNS server(s), select Done and hit <ENTER> to continue.</p>
	<p>A summary of all settings is displayed, if everything looks good hit <ENTER> to continue, all settings will then be applied.</p>
	<p>Hit <ENTER> to continue.</p>

	<p>Enter the password you'd like to use for the 'loadbalancer' WebUI user account and the 'root' Linux user account, select Done and hit <ENTER> to continue.</p>
	<p>At this stage you'll be asked if you're recovering from node (i.e. Primary or Secondary) failure.</p> <p>If you're simply deploying a new appliance, select No and hit <ENTER> to continue.</p> <div data-bbox="986 1086 1045 1120">Note</div> <div data-bbox="1125 990 1444 1220"> <p>For More details on node recovery using this option please refer to Disaster Recovery After Node (Primary or Secondary) Failure.</p> </div>

10. Accessing the WebUI

The WebUI is accessed using a web browser. By default, user authentication is based on local Apache .htaccess files. User administration tasks such as adding users and changing passwords can be performed using the WebUI menu option: *Maintenance > Passwords*.

Note

A number of compatibility issues have been found with various versions of Internet Explorer and Edge. The WebUI has been tested and verified using both Chrome & Firefox.

Note

If required, users can also be authenticated against LDAP, LDAPS, Active Directory or Radius. For more information please refer to [External Authentication](#).

1. Using a browser, access the WebUI using the following URL:

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

2. Log in to the WebUI:

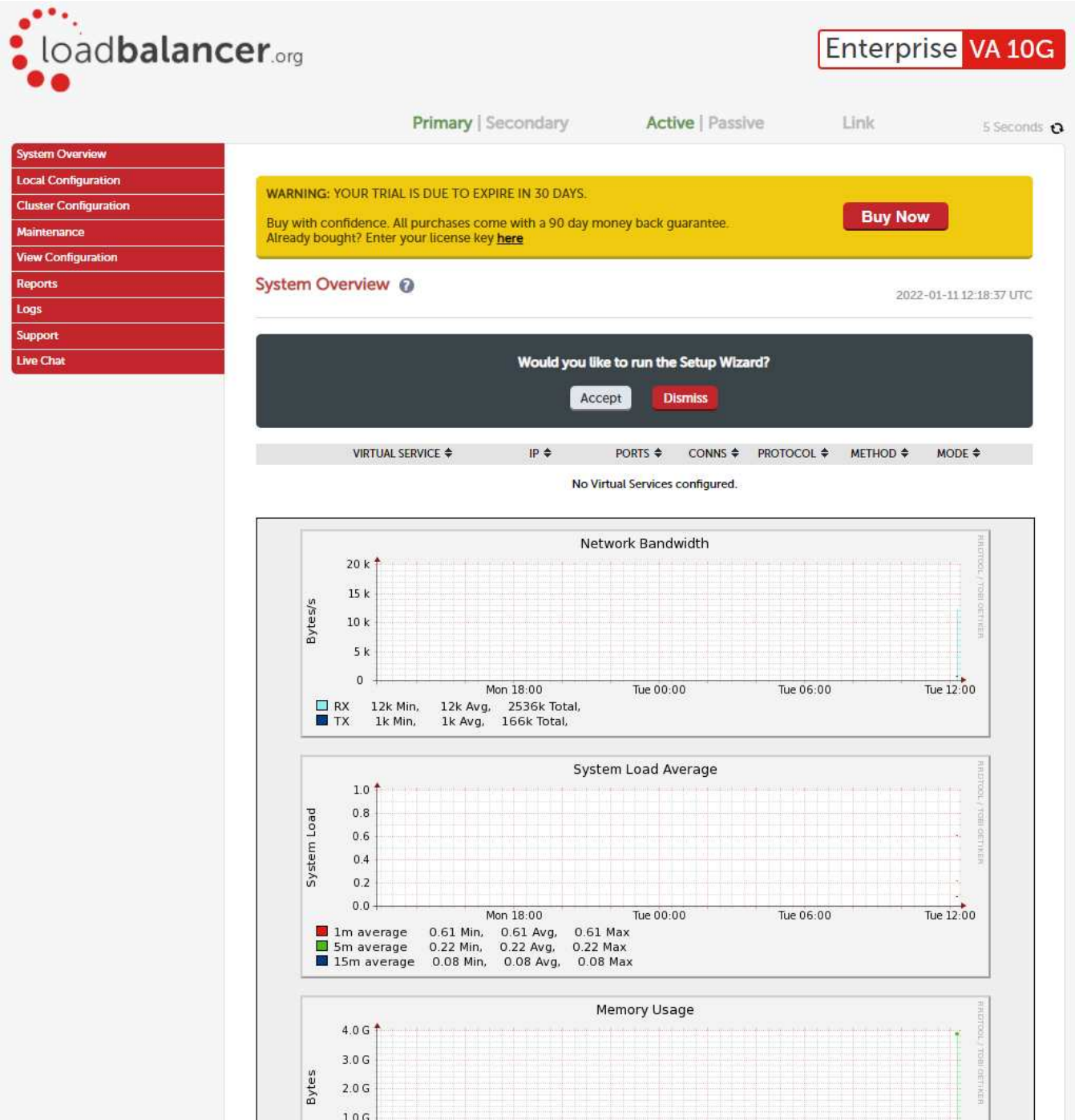
Username: loadbalancer

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:



Note

The WebUI for the VA is shown, the hardware and cloud appliances are very similar. The yellow licensing related message is platform & model dependent.

3. You'll be asked if you want to run the Setup Wizard. If you click **Accept** the Layer 7 Virtual Service configuration wizard will start. If you want to configure the appliance manually, simple click **Dismiss**.

Main Menu Options

System Overview - Displays a graphical summary of all VIPs, RIPv 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 & RIPv

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

11. Licensing

The trial runs for 30 days and is completely unrestricted during this time. After 30 days, the appliance continues to work but it's no longer possible to make changes to the configuration. If you need more time to complete your evaluation, please contact sales@loadbalancer.org who will be able to provide guidance on how to extend the trial using a simple command.

When a license is purchased, you'll be provided with a license key file by our sales team. You can then simply apply this license to your appliance.

To install the license:

1. Using the WebUI, navigate to: *Local Configuration > License Key*.
2. Browse to the license file provided when the appliance was purchased.
3. Click **Install License Key**.

12. Software Updates

Loadbalancer.org continually develop and add new and improved features to the appliance. These updates can be applied during the trial to ensure you have the very latest version of our software for your evaluation.

To Check for Software Updates:

1. Using the WebUI, navigate to: *Maintenance > Software Update*.
2. Choose **Online Update** if the appliance has Internet access.
3. If updates are available, you'll be presented with a list of changes, click the **Online Update** button at the bottom of the page to start the update.

Note

If your appliance does not have Internet access, please contact support@loadbalancer.org for details of how to obtain the offline update files.

13. Configuring & Testing a Simple Load Balanced Test Environment

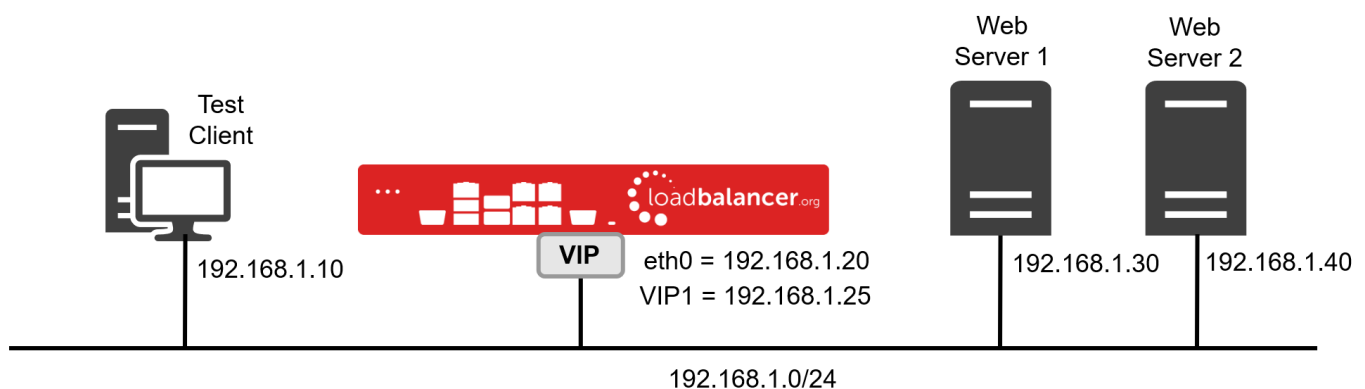
This configuration example illustrates how to quickly configure a simple layer 7 load balanced test environment.

Note

Layer 7 SNAT mode is used in the example. As mentioned earlier, this is not the fastest mode but is very simple to deploy and requires no changes to the Real Servers.

The following table & diagram describe the environment:

IP Address	Device	Notes
192.168.1.10	Test Client	
192.168.1.20	Load Balancer	the load balancer's own IP address
192.168.1.25	Load Balancer	the Virtual IP address (VIP), the IP address clients connect to
192.168.1.30	Web Server 1	the first Real Server (RIP)
192.168.1.40	Web Server 2	the second Real Server (RIP)



STEP 1 - Deploy the Appliance

Please refer to [Appliance Deployment](#).

STEP 2 - Run the Network Setup Wizard

Please refer to [Configuring Initial Network Settings](#).

STEP 3 - Configure the Virtual Service (VIP) & Associated Real Servers (RIPs)

VIP Configuration

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

Virtual Service		[Advanced +]
Label	<input type="text" value="Web-Cluster"/>	?
IP Address	<input type="text" value="192.168.1.25"/>	?
Ports	<input type="text" value="80"/>	?
Protocol		
Layer 7 Protocol	<input type="text" value="HTTP Mode"/>	?
		<input type="button" value="Cancel"/> <input type="button" value="Update"/>

- Specify an appropriate *Label* (name) for the Virtual Service, e.g. **Web-Cluster**.
- Set the *IP Address* field to the required address, e.g. **192.168.1.25**.
- Set the *Ports* field to the required port, e.g. **80**.
- Leave the *Protocol* set to **HTTP Mode**.

3. Click **Update** to create the Virtual Service.

RIP Configuration

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:

Label	<input type="text" value="Web1"/>	?
Real Server IP Address	<input type="text" value="192.168.1.30"/>	?
Real Server Port	<input type="text" value="80"/>	?
Re-Encrypt to Backend	<input type="checkbox"/>	?
Enable Redirect	<input type="checkbox"/>	?
Weight	<input type="text" value="100"/>	?
		<input type="button" value="Cancel"/> <input type="button" value="Update"/>

- Specify an appropriate *Label* for the RIP, e.g. **Web1**.
- Set the *Real Server IP Address* field to the required address, e.g. **192.168.1.30**.
- Set the *Real Server Port* field to the required port, e.g. **80**.

3. Click **Update** to add the Real Server.

4. Now repeat these steps to add the second Real Server, e.g. **Web2**.

Note

By default, Real Server health-checks are set to use a TCP port connect. If you need a more robust check, this can be changed by modifying the configuration as explained below. For more information, please refer to [Real Server Health Monitoring & Control](#).

STEP 4 - Finalizing the Configuration

To apply the new settings, HAProxy must be reloaded. This can be done using the button in the blue box at the top of the screen or by using the *Restart Services* menu option:

1. Using the WebUI, navigate to: *Maintenance > Restart Services*.
2. Click **Reload HAProxy**.

STEP 5 - Viewing & Modifying the Configuration

1. The VIP can be viewed using the WebUI menu option: *Cluster Configuration > Layer 7 - Virtual Services* as shown below:

Layer 7 - Virtual Services

<input type="text" value="Search.."/>				Add a new Virtual Service	
Service Name	IP	Port	Config Type		
Web-Cluster	192.168.1.25	Ports 80	Auto	Modify	Delete

- Clicking the **Modify** button allows all VIP settings to be modified.
 - If changes are made, click the **Update** button to save the changes, then use the **Reload HAProxy** button in the blue box at the top of the screen to apply the changes.
2. The RIP(s) can be viewed using the WebUI menu option: *Cluster Configuration > Layer 7 - Real Services* as shown below:

Layer 7 - Real Servers

Web-Cluster		192.168.1.25	Ports 80	Add a new Real Server	
Web1	192.168.1.30	80	Weight 100	Modify	Delete

- Clicking the **Modify** button allows all RIP settings to be modified.
- If changes are made, click the **Update** button to save the changes, then use the **Reload HAProxy** button in the blue box at the top of the screen to apply the changes.

STEP 6 - Checking the Status using System Overview

1. Using the WebUI, navigate to: *System Overview* to view the newly created VIP & RIPs. Green indicates that the associated RIPs are passing their health checks:

	VIRTUAL SERVICE ▾	IP ▾	PORTS ▾	CONNS ▾	PROTOCOL ▾	METHOD ▾	MODE ▾	
	Test-VIP	192.168.1.25	80	0	TCP	Layer 7	Proxy	

- Click anywhere on the VIP's horizontal grey area to expand the VIP and view the RIPs:

	Test-VIP	192.168.1.25	80	0	TCP	Layer 7	Proxy	
	REAL SERVER	IP	PORTS	WEIGHT	CONNS			
	Web1	192.168.1.30	80	100	0	Drain	Halt	
	Web2	192.168.1.40	80	100	0	Drain	Halt	

STEP 7 - Verification & Testing

- Verify that both Real Servers are up. In the example below, Web2 is failing its health-check:

	Test-VIP	192.168.1.25	80	0	TCP	Layer 7	Proxy	
	REAL SERVER	IP	PORTS	WEIGHT	CONNS			
	Web1	192.168.1.30	80	100	0	Drain	Halt	
	Web2	192.168.1.40	80	100	0	Drain	Halt	

- This should be investigated and corrected, possible steps include:
 - Check that the application/service is running on the Real Server
 - Make sure you can ping the Real Server from the load balancer
 - Verify that you can connect to the application port from the load balancer. This can be done using telnet at the console or via an SSH session:

```
telnet 192.168.1.40 80
```

- Once both servers are up (shown green) browse to the VIP address and verify that you see the web page from each Real Server:
 - Halt Web1 using the *Halt* option for Web1 in the System Overview and verify that content is served by Web2 on a browser refresh (CTRL-F5)
 - Halt Web2 using the *Halt* option for Web2 in the System Overview and verify that content is served by Web1 on a browser refresh (CTRL-F5)

Note

For more configuration examples using Layer 7 SNAT mode and also Layer 4 DR mode, Layer 4 NAT mode & Layer 4 SNAT mode, please refer to [Configuration Examples](#).

Note

For more information on verifying your test environment and for ways to diagnose any issues you may have, please refer to [Testing Load Balanced Services](#).

14. 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 should be configured first, then the Secondary should be added. Once the Primary and Secondary are paired, all load balanced services configured on the Primary are automatically replicated to the Secondary over the network using SSH/SCP.

Note

For Enterprise Azure, the HA pair should be configured first. In Azure, when creating a VIP using an HA pair, 2 private IPs must be specified – one for the VIP when it's active on the Primary and one for the VIP when it's active on the Secondary. Configuring the HA pair first, enables both IPs to be specified when the VIP is created.

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.

Note


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	All network settings including IP address(es), bonding configuration and VLANs
Local Configuration	Routing	Routing configuration including default gateways and static routes
Local Configuration	System Date & time	All time and date related settings
Local Configuration	Physical – Advanced Configuration	Various settings including Internet Proxy, Management Gateway, Firewall connection tracking table size, NIC offloading, SMTP relay, logging and Syslog Server
Local Configuration	Security	Appliance security settings
Local Configuration	SNMP Configuration	Appliance SNMP settings
Local Configuration	Graphing	Appliance graphing settings
Local Configuration	License Key	Appliance licensing
Maintenance	Software Updates	Appliance software update management
Maintenance	Firewall Script	Appliance firewall (iptables) configuration
Maintenance	Firewall Lockdown Wizard	Appliance management lockdown settings

To add a Secondary node - i.e. create a highly available clustered pair:

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



192.168.110.40 loadbalancer.org

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 above.
4. Click **Add new node**.
5. The pairing process now commences as shown below:

CREATE A CLUSTERED PAIR



192.168.110.40 loadbalancer.org



192.168.110.41 loadbalancer.org

Attempting to pair..

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

	192.168.110.40	loadbalancer.org	Break Clustered Pair
	192.168.110.41	loadbalancer.org	

7. To finalize the configuration, restart heartbeat and any other services as prompted in the blue 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](#).

15. More Information

Please refer to our website for all the latest [Manuals](#) and [Deployment Guides](#).

16. Loadbalancer.org Technical Support

If you have any questions regarding the appliance or need assistance with load balancing your application, please don't hesitate to contact our support team using the following email address: support@loadbalancer.org.

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.



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