Load Balancing Bloxx Web Filter

v1.4.2

Deployment Guide

NOTE: This guide has been archived and is no longer being maintained. While the content is still valid for the particular software versions mentioned, it may refer to outdated software that has now reached end-of-life. For more information please contact support@loadbalancer.org.

loadbalancer.org

Contents

1. About this Guide 4
2. Loadbalancer.org Appliances Supported 4
3. Loadbalancer.org Software Versions Supported 4
4. Bloxx Web Filter Appliances Supported 4
5. Loadbalancer.org & Bloxx 5
6. Benefits of Implementing a Load Balancer 5
7. Load Balancer Configuration Options 5
Deployment Modes *5*
Layer 4 (Recommended) 5
Layer 7 5
Persistence / Server Affinity *6*
Source IP Address (Recommended) 6
Destination Hash 6
8. Web Filter Deployment Modes 6
1 – Explicit Proxy Mode (Recommended) *6*
2 – Transparent Routed Proxy Mode *6*
9. Summary of Deployment Options 6
10. Loadbalancer.org Appliance – the Basics 7
Virtual Appliance Download & Deployment *7*
Initial Network Configuration *8*
Accessing the Web User Interface (WebUI) *8*
HA Clustered Pair Configuration *9*
11. Option 1 - Explicit Proxy Mode (Recommended) 10
Option 1A – Using DR (Direct Return) Mode (Recommended) *10*
Deployment Architecture 10
Load Balancer Configuration 11
Web Filter Configuration 12
Finalize Settings 13
Option 1B – Using NAT Mode *14*
Deployment Architecture 14
Load Balancer Configuration 15
Web Filter Configuration 18
Finalize Settings 18
Option 1C – Using NAT Mode (Preferred NAT Topology) *19*
Deployment Architecture 19
Load Balancer Configuration 20
Web Filter Configuration 22
Finalize Settings 22
Configuration Settings Common to Options 1A, 1B & 1C *22*
Web Filter Operating Mode 22
Proxy Port Configuration 23
Client Configuration 24
12. Option 2 - Transparent Routed Proxy Mode 25

Deployment Architecture 25
Load Balancer Configuration *26*
Create the Virtual Service (VIP) 26
Add the Floating IP 27
Configure Appliance Firewall Rules 27
Define the Real Servers (RIPs) 28
Web Filter Configuration *29*
Web Filter Operating Mode 29
Router/Default Gateway Configuration *29*
Client Configuration *30*
13. Testing & Validation 30
Layer 4 – Current Connections *30*
14. Technical Support 31
15. Further Documentation 31
16. Conclusion 31
17. Appendix 32
1 – Clustered Pair Configuration – Adding a Slave Unit *32*
2 – Modified Transparent Mode Firewall Rules *34*
18. Document Revision History 35

1. About this Guide

This guide details the steps required to configure a load balanced Bloxx Web Filter environment utilizing Loadbalancer.org appliances. It covers the configuration of the load balancers and also any Bloxx Web Filter 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 relevant Administration Manual:

- v7 Administration Manual
- v8 Administration Manual

2. Loadbalancer.org Appliances Supported

All our products can be used for load balancing Bloxx Web Filters. The complete list of models is shown below:

Discontinued Models	Current Models *
Enterprise R16	Enterprise R20
Enterprise VA R16	Enterprise MAX
Enterprise VA	Enterprise 10G
Enterprise R320	Enterprise 40G
	Enterprise Ultra
	Enterprise VA R20
	Enterprise VA MAX
	Enterprise AWS **
	Enterprise AZURE **
	Enterprise GCP **

* For full specifications of these models please refer to: http://www.loadbalancer.org/products/hardware

** Some features may not be supported, please check with Loadbalancer.org support

3. Loadbalancer.org Software Versions Supported

- v7.6.4 and later

4. Bloxx Web Filter Appliances Supported

- All versions

5. Loadbalancer.org & Bloxx

Loadbalancer.org and Bloxx have partnered to provide high performance, robust and highly available Web Filtering solutions that enable customers to deploy with confidence.

6. Benefits of Implementing a Load Balancer

Implementing Loadbalancer.org appliances enables multiple Bloxx Web Filters to be deployed in a cluster. This provides the following key benefits:

- **High-Availability –** If a Web Filter fails, service is not interrupted
- **Maintenance** – Web Filters can easily be taken out of the cluster for maintenance
- **Performance** – For additional performance simply add more Web Filters to the cluster

7. Load Balancer Configuration Options

The following sections describe the various load balancer deployment modes and persistence options that are used when load balancing Web Filters.

Deployment Modes

Layer 4 (Recommended)

DR Mode - Direct Server Return Mode (Recommended)

In this mode, traffic from the client to the Web Filter passes via the load balancer, return traffic passes directly back to the client which maximizes performance. Direct routing works by changing the destination MAC address of the incoming packet on the fly which is very fast. This mode is transparent by default meaning that the Web Filter sees the real client IP address and not the IP address of the load balancer.

Due to its speed, overall simplicity and effectiveness, Direct Routing (DR) mode with source IP persistence is our recommended method and can be used in both Explicit Proxy Mode & Transparent Routed Proxy Mode.

NAT Mode - Network Address Translation Mode

This mode requires the implementation of a two-arm infrastructure with an internal and external subnet to carry out the translation (the same way a firewall works). Return traffic MUST pass back via the load balancer. This can be achieved by either setting the default gateway on the Web Filters to be the load balancer or by configuring a static route on the Web Filters that forces client return traffic to pass back via the load balancer. This mode offers high performance and like DR mode is transparent by default.

Layer 7

SNAT Mode - Source Network Address Translation

Using HAProxy in SNAT mode means that the load balancer is acting as a full proxy and therefore it doesn't have the same raw throughput as the layer 4 methods. Also, this method is not transparent by default so the real servers (i.e. the Web Filters) will see the source address of each request as the load balancers IP address. This is generally not desirable, although this can be resolved in two ways: either by reading the X-Forwarded-For header that's included by default

when using HAProxy, or by enabling TProxy on the load balancer. The issue with using TProxy is that the default gateway on the real servers must be changed to be the load balancer and it also requires a two-arm infrastructure with two subnets which complicates the deployment. The same requirements apply when using layer 4 NAT mode as mentioned above. SNAT mode does not have the raw throughput of the layer 4 solutions and is therefore not normally used for Web Filter load balancing deployments.

Persistence / Server Affinity

Persistence may or may not be required and depends on the specific Web Filter being used. Two possible methods are described in the following sections.

Source IP Address (Recommended)

Source IP persistence is the default option for Layer 4 services and can easily be selected for Layer 7 services. When set, clients connecting from the same source IP address within the persistence timeout period (the default is 5 minutes) will always be sent to the same Web Filter.

Destination Hash

Another option at layer 4 is to change the load balancing algorithm (i.e. the "scheduler") to destination hash (DH). This causes the load balancer to select the proxy based on a hash of the destination IP address. This causes session requests to be directed at the same server based solely on the destination IP address of a packet which therefore makes client connections persistent for a particular Internet host.

Since this setting is a scheduler, the way connections are load balanced will also change. However it should still provide a well balanced distribution of client sessions between Web Filters.

8. Web Filter Deployment Modes

There are two implementation methods that are typically used – Explicit Proxy Mode & Transparent Routed Proxy Mode.

1 – Explicit Proxy Mode (Recommended)

This mode requires the load balancers VIP address to be defined in users browsers. This means that the load balancer will receive client requests and distribute these requests across the back-end Web Filters. Please refer to the section starting on page 10 for configuration details.

2 – Transparent Routed Proxy Mode

With this mode, client requests must be routed to the load balancer/Web Filter cluster. This can be achieved by either setting the default gateway on the client PCs to be the load balancer, or by adding rules to the default gateway device. Rules would typically be configured for HTTP & HTTPS traffic on ports 80 and 443. Please refer to the section starting on page 25 for configuration details.

9. Summary of Deployment Options

Option	Web Filter Mode	Load Balancer Mode	Notes
Option 1A (Recommended)	Explicit Proxy Mode	DR Mode	The Web Filters must be configured to accept traffic for the VIP. Please refer to page 10 for configuration details.
Option 1B	Explicit Proxy Mode	NAT Mode	The load balancer must be set as the default gateway for the Web Filters. Please refer to page 14 for configuration details.
Option 1C	Explicit Proxy Mode	NAT Mode	A static route must be configured on the Web Filters to send client return traffic back via the load balancer. Please refer to page 19 for configuration details.
Option 2	Transparent Routed Proxy Mode	DR Mode	Firewall rules must be added to the load balancer to transparently send traffic to the Web Filters. Please refer to page 25 for configuration details.

10. Loadbalancer.org Appliance – the Basics

Virtual Appliance Download & Deployment

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 and XEN and has been optimized for each Hypervisor. By default, the VA is allocated 1 CPU, 2GB of RAM and has an 8GB 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 Administration Manual and the ReadMe.txt text file included in the VA download for more detailed information on deploying the VA using various Hypervisors.

Initial Network Configuration

The IP address, subnet mask, default gateway and DNS settings can be configured in several ways as detailed below:

Method 1 - Using the Network Setup Wizard at the console

After boot up, follow the instructions on the console to configure the IP address, subnet mask, default gateway and DNS settings.

Method 2 - Using the WebUI

Using a browser, connect to the WebUI on the default IP address/port: **https://192.168.2.21:9443**

To set the IP address & subnet mask, use: *Local Configuration > Network Interface Configuration*

To set the default gateway, use: *Local Configuration > Routing*

To configure DNS settings, use: *Local Configuration > Hostname & DNS*

Accessing the Web User Interface (WebUI)

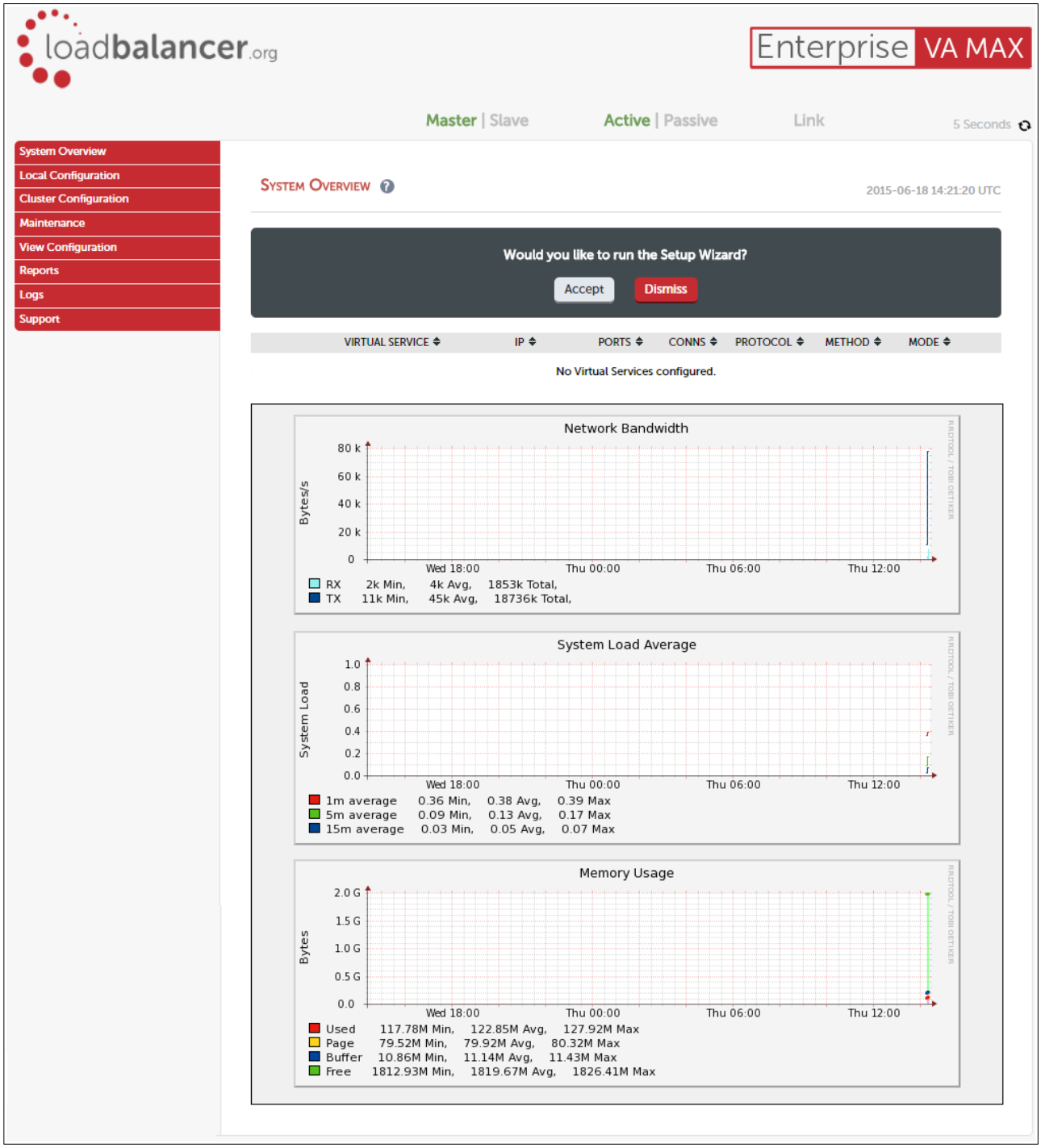
1. Browse to the following URL: **https://192.168.2.21:9443/lbadmin/**
   (replace with your IP address if it's been changed)
   ** Note the port number → **9443***

2. Login to the WebUI:

   Username: loadbalancer
   Password: loadbalancer

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

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



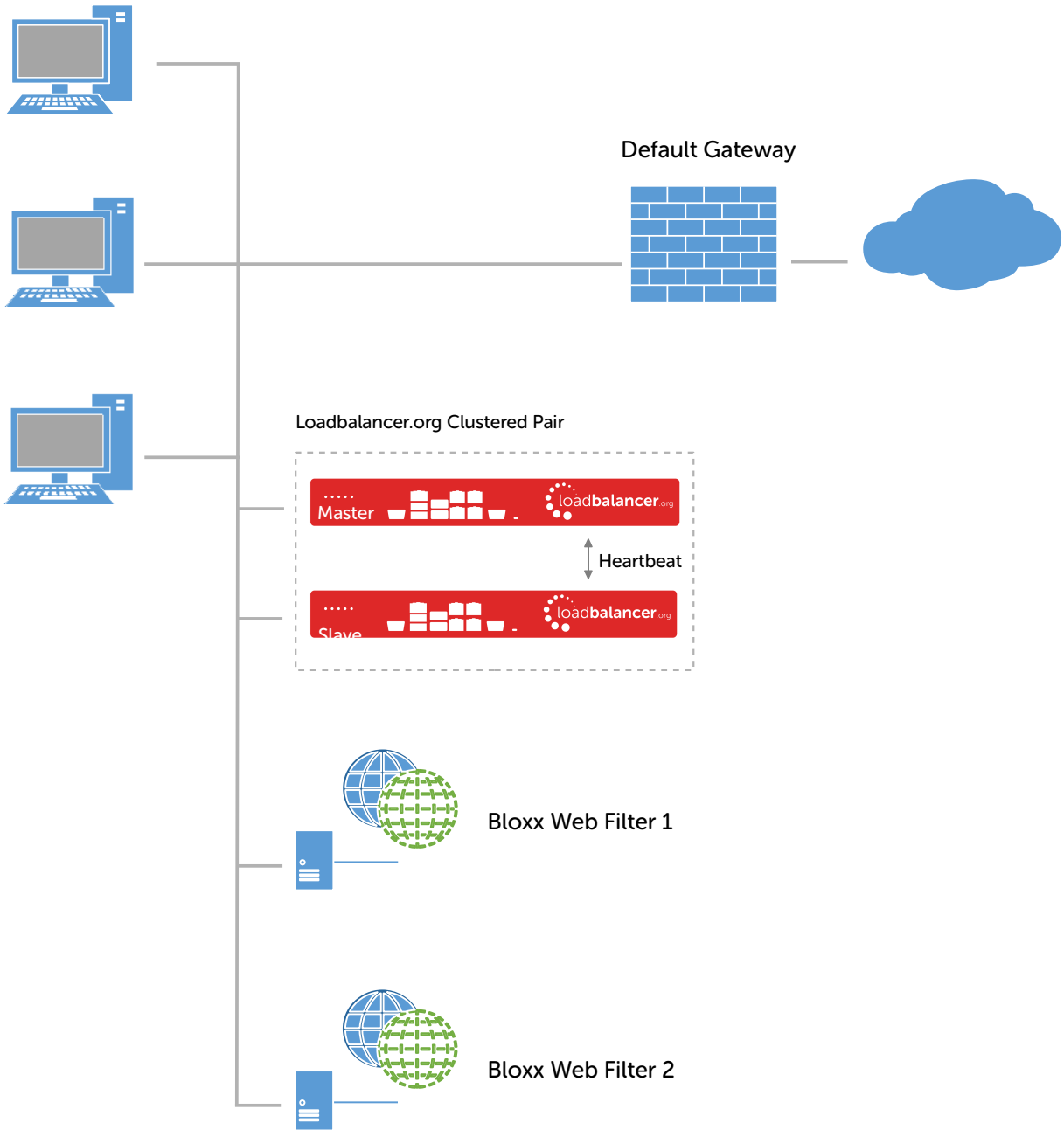
HA Clustered Pair Configuration

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 slave unit is covered in section 1 of the Appendix on page 32.

11. Option 1 - Explicit Proxy Mode (Recommended)

Option 1A – Using DR (Direct Return) Mode (Recommended)

Deployment Architecture



Notes:

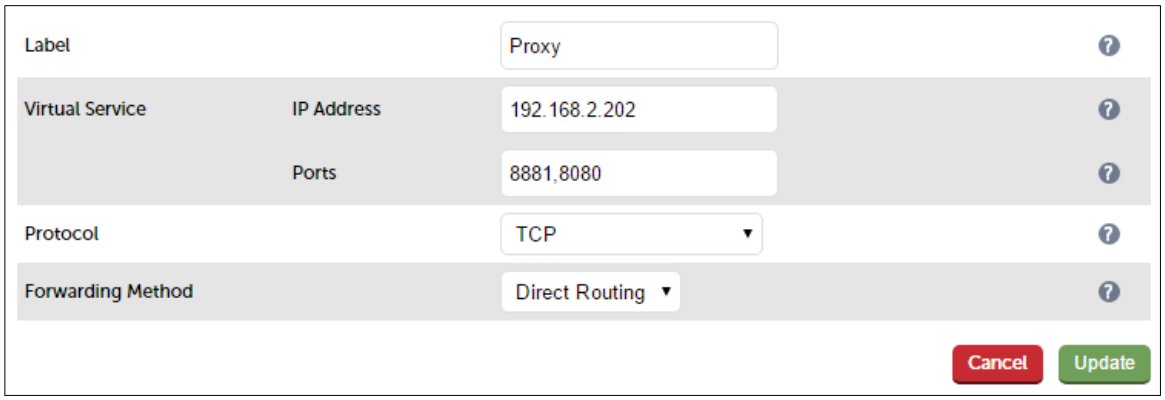
- Browser settings on client PC's must be changed to point at the Virtual Service (VIP) on the load balancer (see page 24)

- The load balancer is configured in one-arm Layer 4 DR mode
- The Bloxx Web Filters must be configured to accept traffic for the VIP (see page 12)
- 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 slave unit is covered in section 1 of the Appendix on page 32

Load Balancer Configuration

Create the Virtual Server/Service (VIP)

1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Virtual Services*
2. Click **Add a New Virtual Service**
3. Enter the following details:



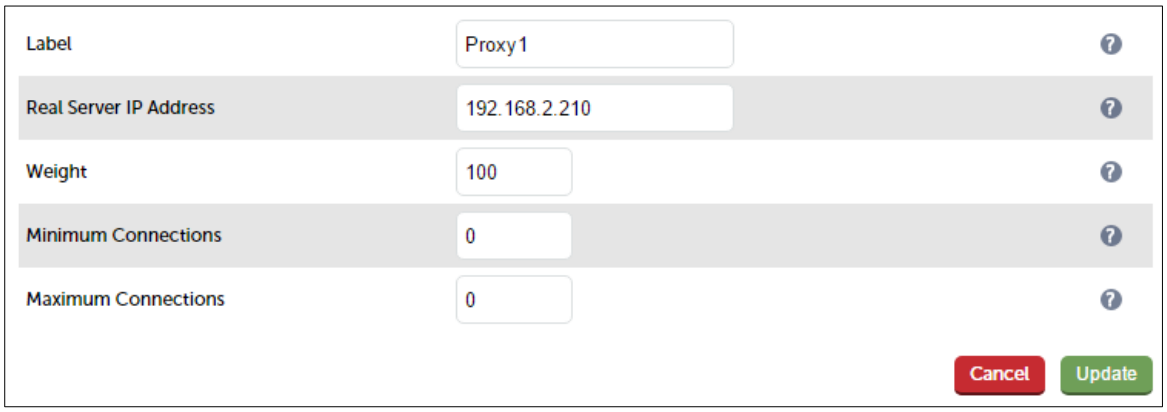
4. Enter an appropriate label (name) for the VIP, e.g. **Proxy**
5. Set the *Virtual Service IP address* field to the required IP address, e.g. **192.168.2.202**
6. Set the *Virtual Service Ports* field to the required port(s) (the same as the Web Filters) , e.g. **8881,8080**

> Note: Port 8881 is the default proxy port, port 8080 is the default SSL intercept port when SSL Intercept is licensed and installed.

7. Ensure that *Protocol* is set to **TCP**
8. Ensure that *Forwarding Method* is set to **Direct Routing**
9. Click **Update**
10. Now click **Modify** next to the newly created VIP
11. Ensure *Persistence* is enabled and set *Persistence Timeout* to **3600** (i.e. 1 hour)
12. Under the *Health Checks* section change *Check Port* to **8881**
13. Click **Update**

Define the Real Servers (RIPs)

1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Real Servers*
2. Click **Add a new Real Server** next to the newly created VIP
3. Enter the following details:



4. Enter an appropriate label (name) for the first Web Filter, e.g. **Proxy1**
5. Change the *Real Server IP Address* field to the required IP address, e.g. **192.168.2.210**
6. Click **Update**
7. Repeat the above steps to add your other Web Filter(s)

Web Filter Configuration

Modify the Web Filters to accept traffic for the VIP

Concept

As mentioned previously, DR mode is our recommended load balancer operating mode. To use this mode, changes are required to the real servers, i.e. the Web Filters. The real servers must accept traffic for the VIP, but they must not respond to any ARP requests for that IP, only the VIP should do this.

To configure a Linux based Web Filter to accept traffic for the VIP, the iptables command below must be added to an appropriate startup script such as **/etc/rc.local** so that it is automatically executed each time the Web Filter boots. It can also be executed immediately by running the command at the command prompt, but the setting will be lost after a reboot unless the command has been added to a startup script.

iptables -t nat -A PREROUTING -p tcp -d <VIP address> -j REDIRECT

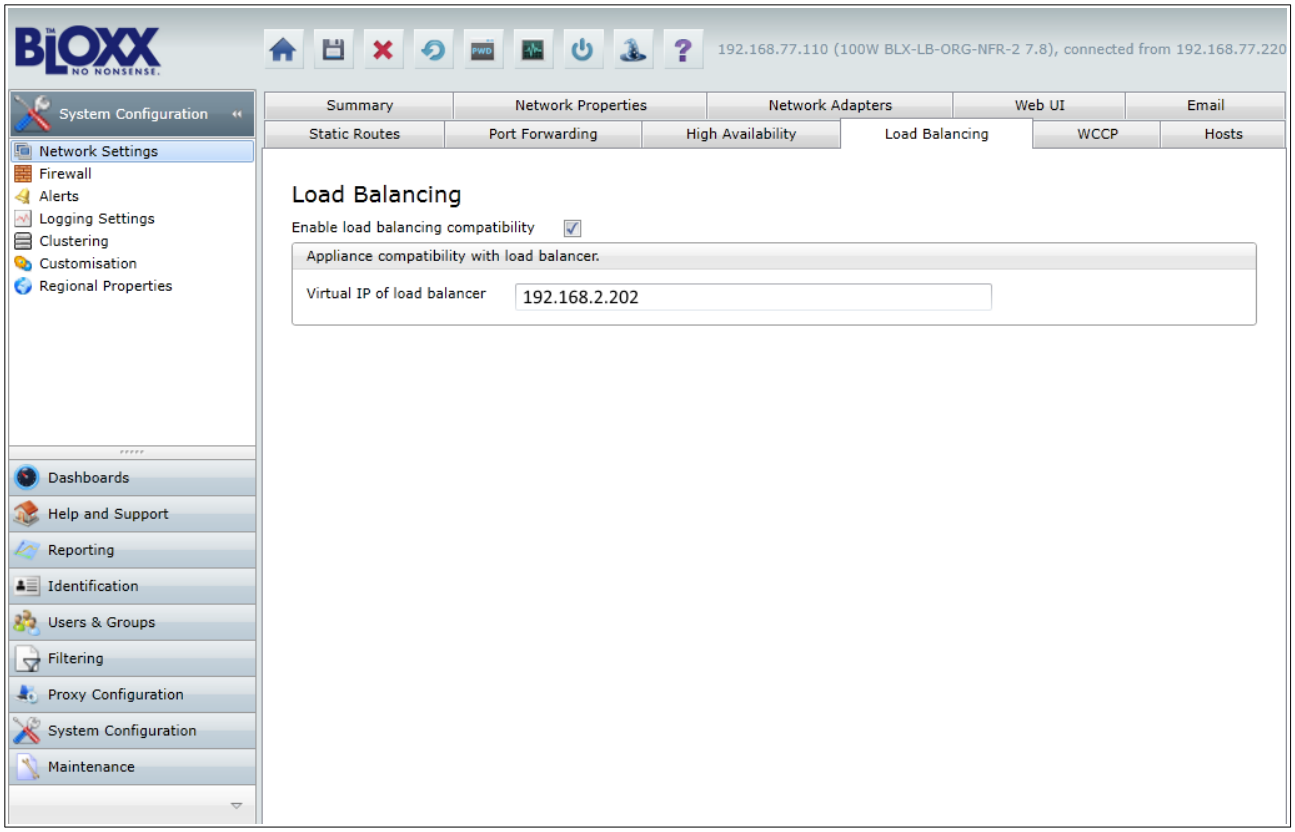
e.g.

iptables -t nat -A PREROUTING -p tcp -d 192.168.2.202 -j REDIRECT

i.e. Redirect any incoming packets destined for the VIP to the local address

Note: For more information please refer to the Administration Manual and search for 'ARP Problem'.

Configuring the Bloxx Appliance using the Bloxx WebUI



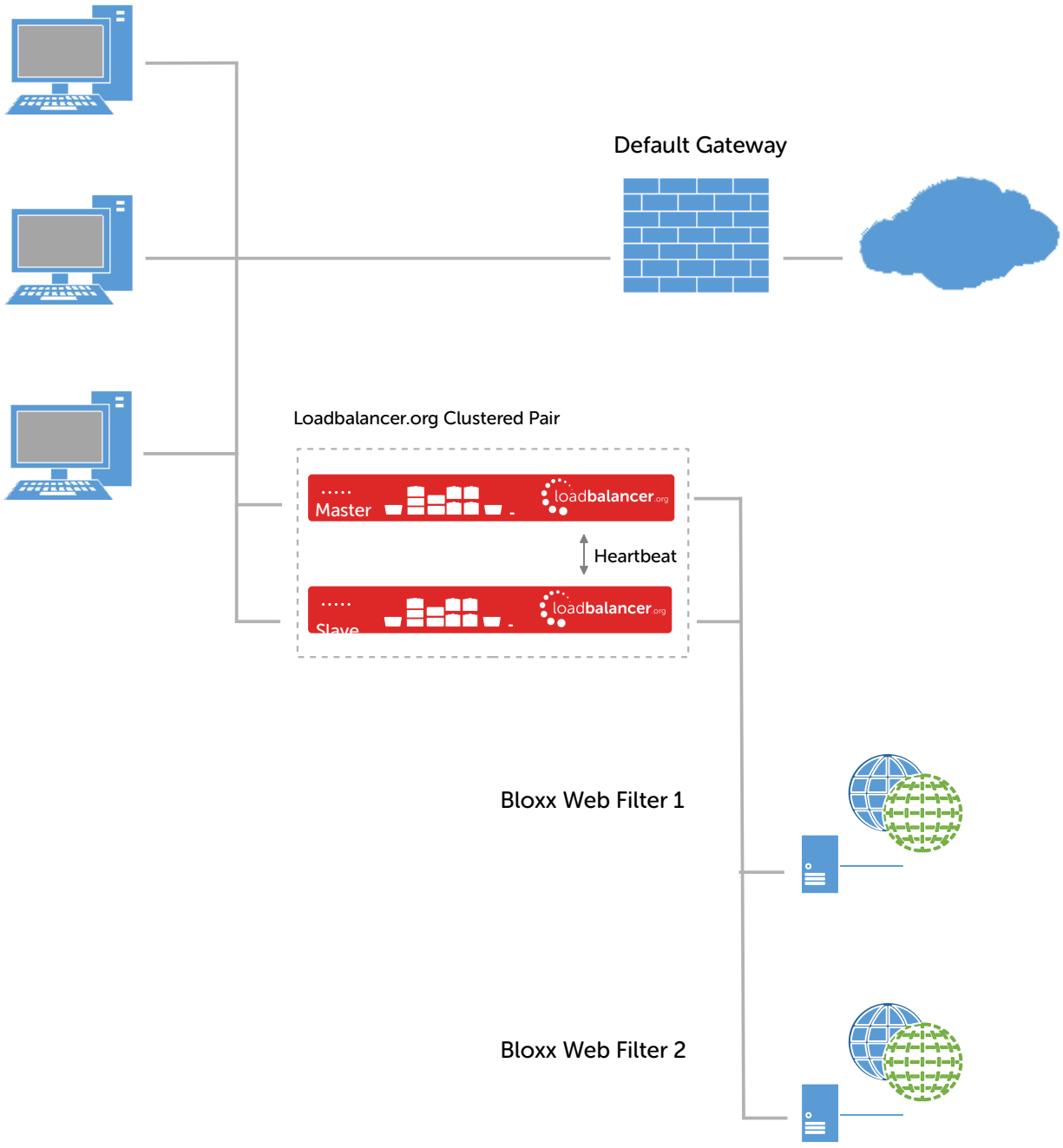
As shown, check the *Enable load balancing compatibility* option and enter the required Virtual Service (VIP) IP address, e.g. **192.168.2.202.**

Finalize Settings

Now refer to the section *"Configuration Settings Common to Options 1A, 1B & 1C"* on page 22 to finalize Web Filter settings and configure client browser settings.

Option 1B – Using NAT Mode

Deployment Architecture



Notes:

- Browser settings on client PC's must be changed to point at the Virtual Service (VIP) on the load balancer (see page 24)
- The load balancer is configured in two-arm Layer 4 NAT mode
- Return traffic MUST pass back via the load balancer. To enable this, the default gateway for the Web Filters is

configured to be the load balancer. For an HA pair, a floating IP address must be configured to allow the gateway to move between master and slave in the event of a failover (see page 15)

- 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 slave unit is covered in section 1 of the Appendix on page 32

Load Balancer Configuration

Configure Network Settings

Two interfaces are required. Typically eth0 is used for the internal (Web Filter) subnet and eth1 is used for the external (client & VIP) subnet, although this is not mandatory since interfaces can be used as required / preferred.

To configure network settings on the load balancer:

1. Ensure that the required cables are plugged in (hardware) or virtual NICs are connected (virtual)
2. Using the WebUI, navigate to: *Local Configuration > Network Interface Configuration*
3. Define the required IP addresses and subnet mask:

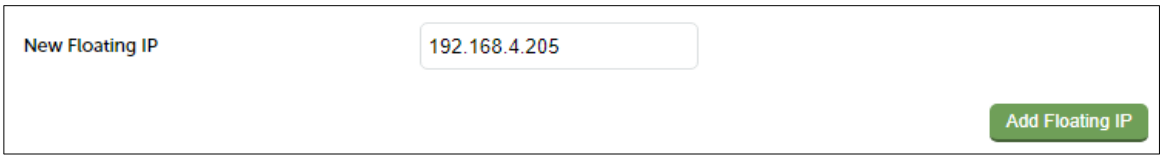
4. Configure the required IP address for eth0, e.g. **192.168.4.200/24**
5. Configure the required IP address for eth1, e.g. **192.168.2.200/24**
6. Click **Configure Interfaces**

Define a Floating IP to be used as the Default Gateway for the Web Filters

As mentioned, when using a clustered pair of load balancers for HA (our recommended configuration), a floating IP must be used as the default gateway for the Web Filters. This will 'float' between the master and slave units in the event of a failover or failback. This ensures that the Web Filters always have a consistent return path via the load balancer – whether the master or slave is active.

To configure a Floating IP:

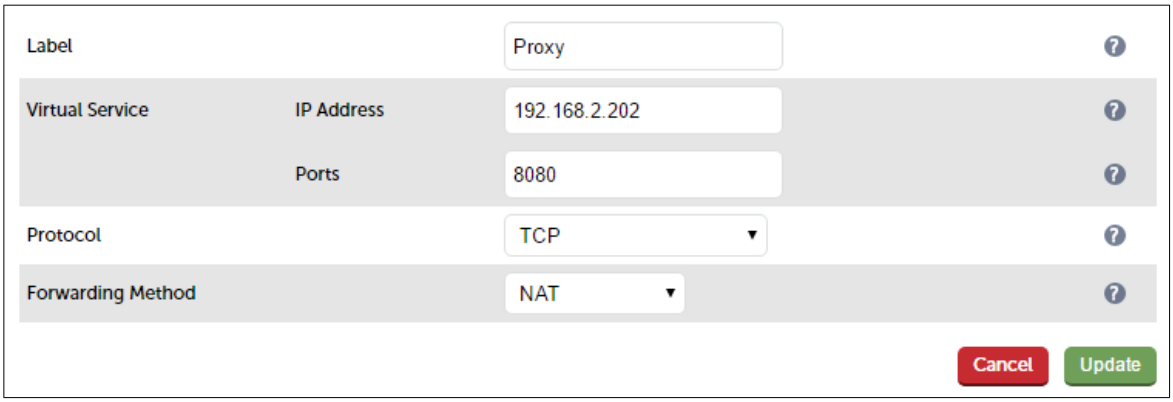
1. Using the WebUI, navigate to: *Cluster Configuration > Floating IP's*



2. Define a suitable IP address for the default gateway , e.g. **192.168.4.205**
3. Click **Add Floating IP**

Create the Virtual Service (VIP)

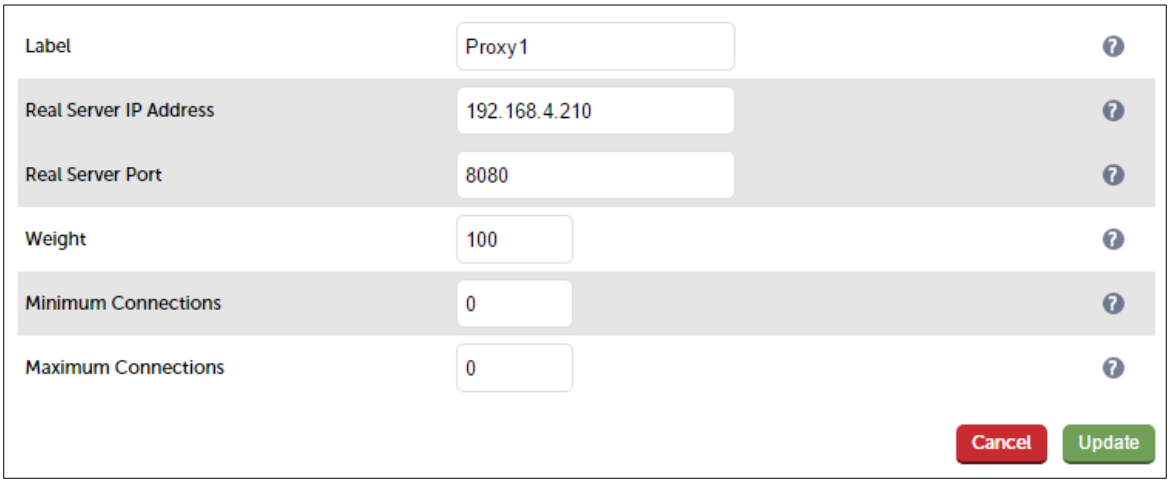
1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Virtual Services*
2. Click **Add a New Virtual Service**
3. Enter the following details:



4. Enter an appropriate label (name) for the VIP, e.g. **Proxy**
5. Set the *Virtual Service IP address* field to the required IP address, e.g. **192.168.2.202**
6. Set the *Virtual Service Ports* field to the required port, e.g. **8080**
7. Ensure that *Protocol* is set to **TCP**
8. Ensure that *Forwarding Method* is set to **NAT**
9. Click **Update**
10. Now click **Modify** next to the newly created VIP
11. Ensure *Persistence* is enabled and set *Persistence Timeout* to **3600** (i.e. 1 hour)
12. Click **Update**

Define the Real Servers (RIPs)

1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Real Servers*
2. Click **Add a new Real Server** next to the newly created VIP
3. Enter the following details:



4. Enter an appropriate label (name) for the first Web Filter, e.g. **Proxy1**
5. Set the *Real Server IP Address* field to the required IP address, e.g. **192.168.4.210**
6. Set the *Real Server Port* field to the required port, e.g. **8080**
7. Click **Update**
8. Repeat the above steps to add your other Web Filter(s)

Enable Auto-NAT

By default, servers behind the load balancer in a NAT configuration will not have access to the outside network. By enabling Auto-NAT, servers (i.e. the Web Filters) will have their requests automatically mapped to the load balancer's external IP address. The default configuration is to map all requests originating from internal network eth0 to the external IP on eth1. A different interface can be selected if required.

To enable Auto-NAT on the load balancer:

1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Advanced configuration*

2. Set the Auto-NAT field to the external interface. As mentioned the default configuration is to use eth1 and the external interface and eth1 as the internal interface, but can be set to suit your needs.
3. Click **Update**

Web Filter Configuration

Configure the Default Gateway

As mentioned, Option 1B requires the default gateway on the Web Filter to be the load balancer. When using an HA pair of load balancers, the gateway on the load balancer must be a Floating IP to provide a consistent return path via the load balancer – whether the master or slave is active. Page 15 details how to create the Floating IP.

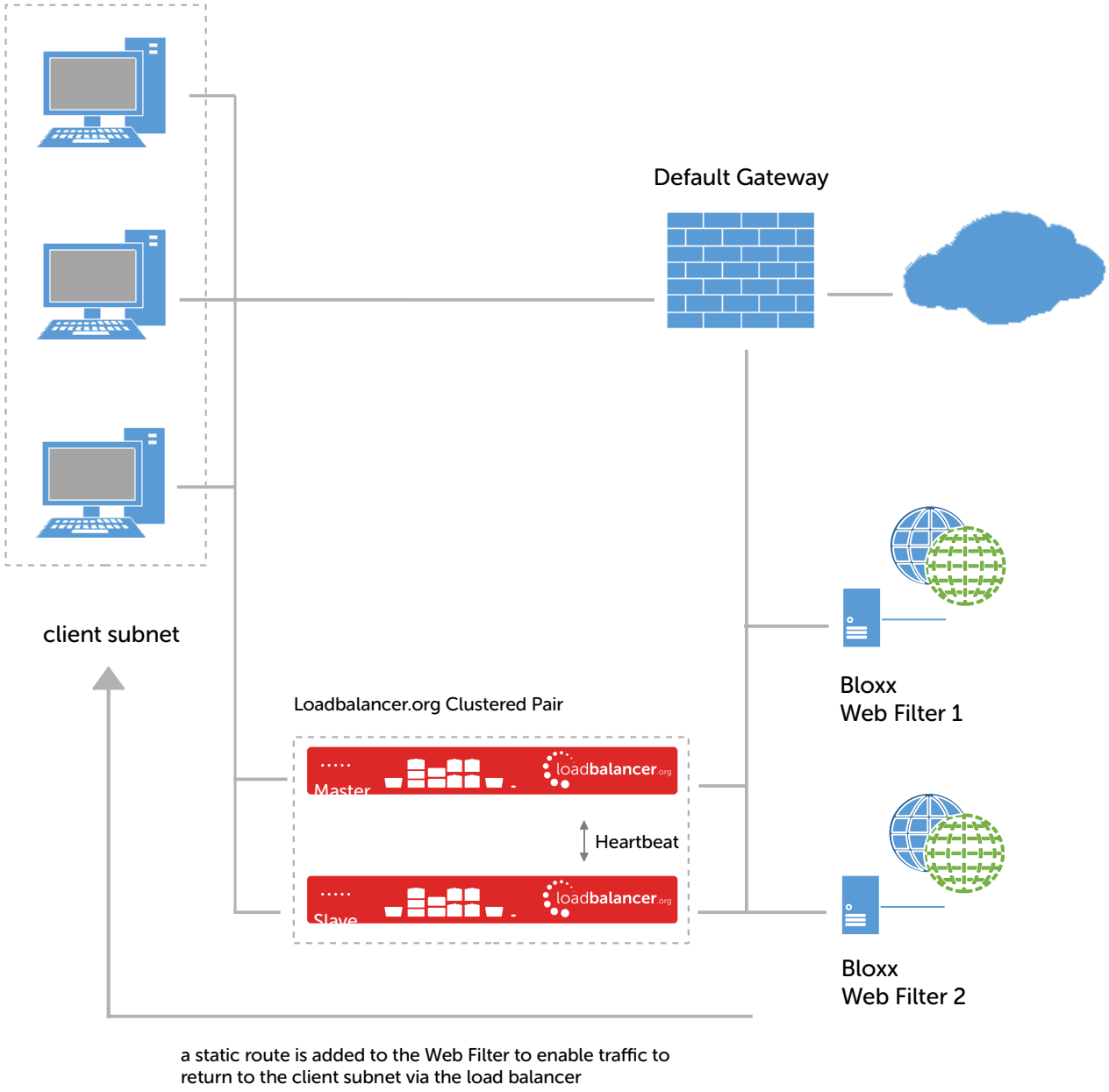
> Note: Please refer to the Bloxx Web Filter documentation for instructions on setting the default gateway. This should be done on all Web Filters.

Finalize Settings

Now refer to the section *"Configuration Settings Common to Options 1A, 1B & 1C"* on page 22 to finalize Web Filter settings and configure client browser settings.

Option 1C – Using NAT Mode (Preferred NAT Topology)

Deployment Architecture



Notes:

- Browser settings on client PC's must be changed to point at the Virtual Service (VIP) on the load balancer (see page 24)
- The load balancer is configured in two-arm Layer 4 NAT mode
- Return traffic MUST pass back via the load balancer. To enable this, a static route is configured on the Web Filters to send return traffic back via the load balancer. For an HA pair, a floating IP address must be configured to allow the gateway to move between master and slave in the event of a failover (see page 20)

- This method is more efficient & faster than Option 1B since the Web Filters can access the Internet directly rather than going via the load balancer
- 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 slave unit is covered in section 1 of the Appendix on page 32

Load Balancer Configuration

Configure Network Settings

Two interfaces are required. Typically eth0 is used for the internal (Web Filter) subnet and eth1 is used for the external (client & VIP) subnet, although this is not mandatory since interfaces can be used as required / preferred.

To configure network settings on the load balancer:

1. Ensure that the required cables are plugged in (hardware) or virtual NICs are connected (virtual)
2. Using the WebUI, navigate to: *Local Configuration > Network Interface Configuration*
3. Define the required IP addresses and subnet mask:

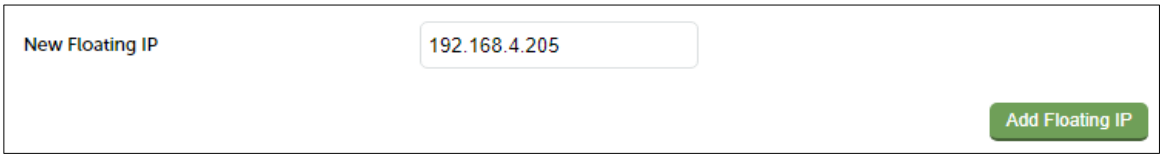
4. Configure the required IP address for eth0, e.g. **192.168.4.200/24**
5. Configure the required IP address for eth1, e.g. **192.168.2.200/24**
6. Click **Configure Interfaces**

Define a Floating IP to be used as the gateway for the Static Route on the Web Filters

As mentioned, when using a clustered pair of load balancers for HA (our recommended configuration), a floating IP must be used as the gateway for the static route on the Web Filters. This will 'float' between the master and slave units in the event of a failover or failback. This ensures that the Web Filters always have a consistent return path via the load balancer – whether the master or slave is active.

To configure a Floating IP:

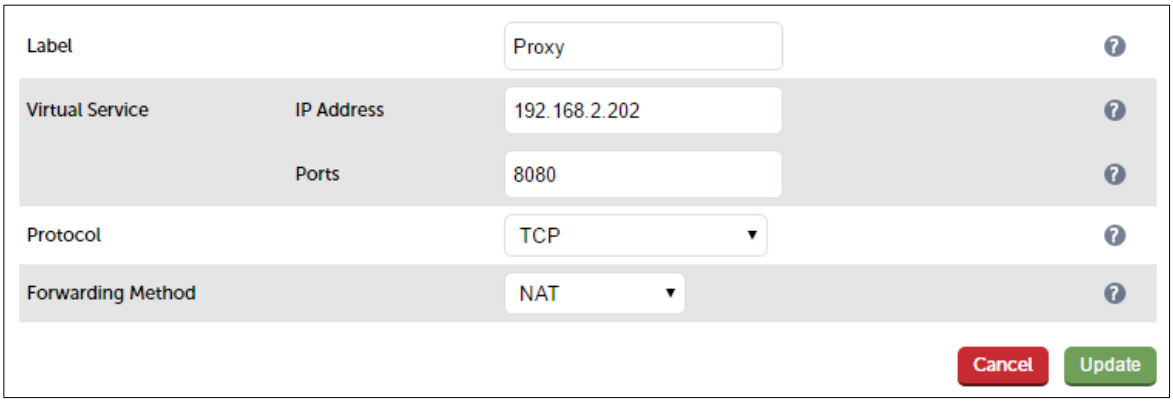
1. Using the WebUI, navigate to: *Cluster Configuration > Floating IP's*



2. Define a suitable IP address for the default gateway , e.g. **192.168.4.205**
3. Click **Add Floating IP**

Create the Virtual Service (VIP)

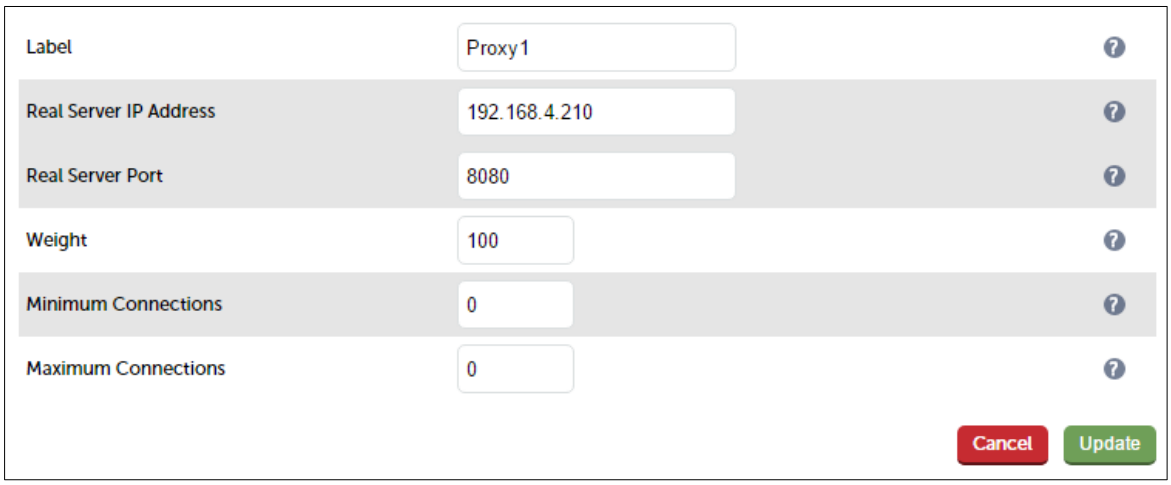
1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Virtual Services*
2. Click **Add a New Virtual Service**
3. Enter the following details:



4. Enter an appropriate label (name) for the VIP, e.g. **Proxy**
5. Set the *Virtual Service IP address* field to the required IP address, e.g. **192.168.2.202**
6. Set the *Virtual Service Ports* field to the required port, e.g. **8080**
7. Ensure that *Protocol* is set to **TCP**
8. Ensure that *Forwarding Method* is set to **NAT**
9. Click **Update**
10. Now click **Modify** next to the newly created VIP
11. Ensure *Persistence* is enabled and set *Persistence Timeout* to **3600** (i.e. 1 hour)
12. Click **Update**

Define the Real Servers (RIPs)

1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Real Servers*
2. Click **Add a new Real Server** next to the newly created VIP
3. Enter the following details:



4. Enter an appropriate label (name) for the first Web Filter, e.g. **Proxy1**
5. Set the *Real Server IP Address* field to the required IP address, e.g. **192.168.4.210**
6. Set the *Real Server Port* field to the required port, e.g. **8080**
7. Click **Update**
8. Repeat the above steps to add your other Web Filter(s)

Web Filter Configuration

Configure a Static Route

As mentioned, Option 1C requires a Static Route to be defined on the Web Filter that forces client return traffic to pass back via the load balancer. When using an HA pair of load balancers, the gateway for the static route must be a Floating IP to provide a consistent return path via the load balancer – whether the master or slave is active. Page 20 details how to create the Floating IP.

> Note: Please refer to the Bloxx Web Filter documentation for instructions on configuring a Static Route. This should be done on all Web Filters.

Finalize Settings

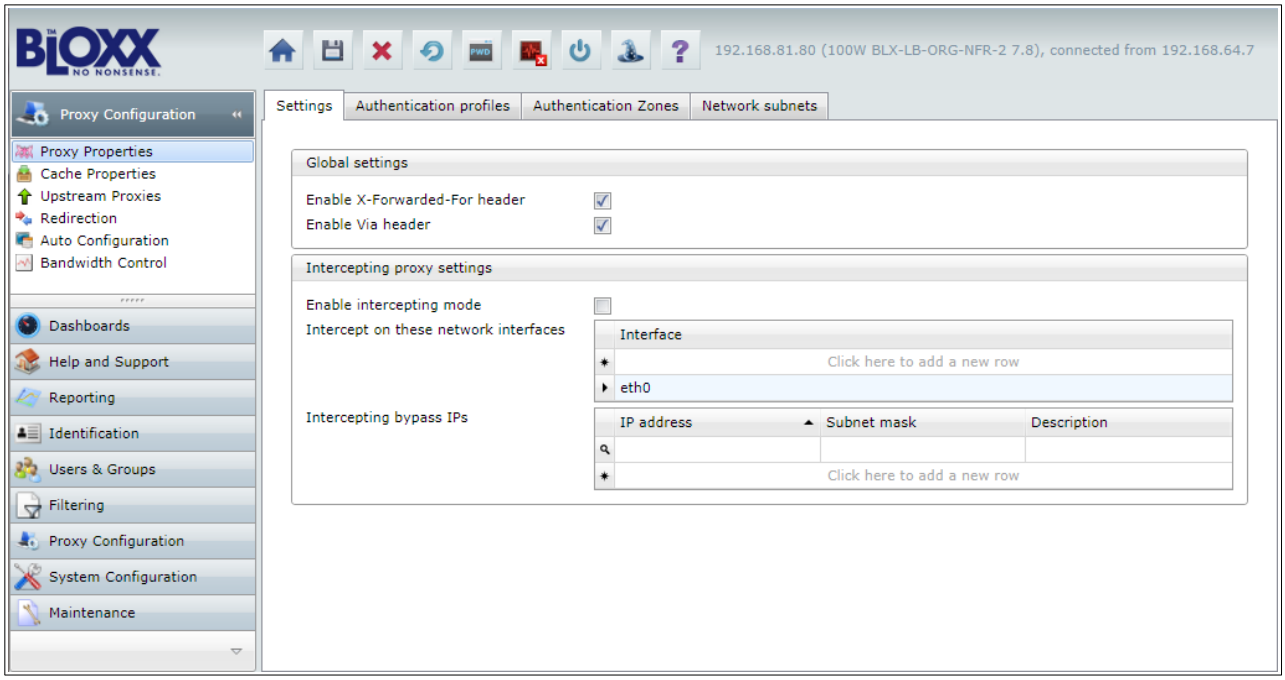
Now refer to the section *"Configuration Settings Common to Options 1A, 1B & 1C"* below to finalize Web Filter and client browser settings.

Configuration Settings Common to Options 1A, 1B & 1C

The steps in the following 3 sub sections must be followed for options 1A, 1B & 1C.

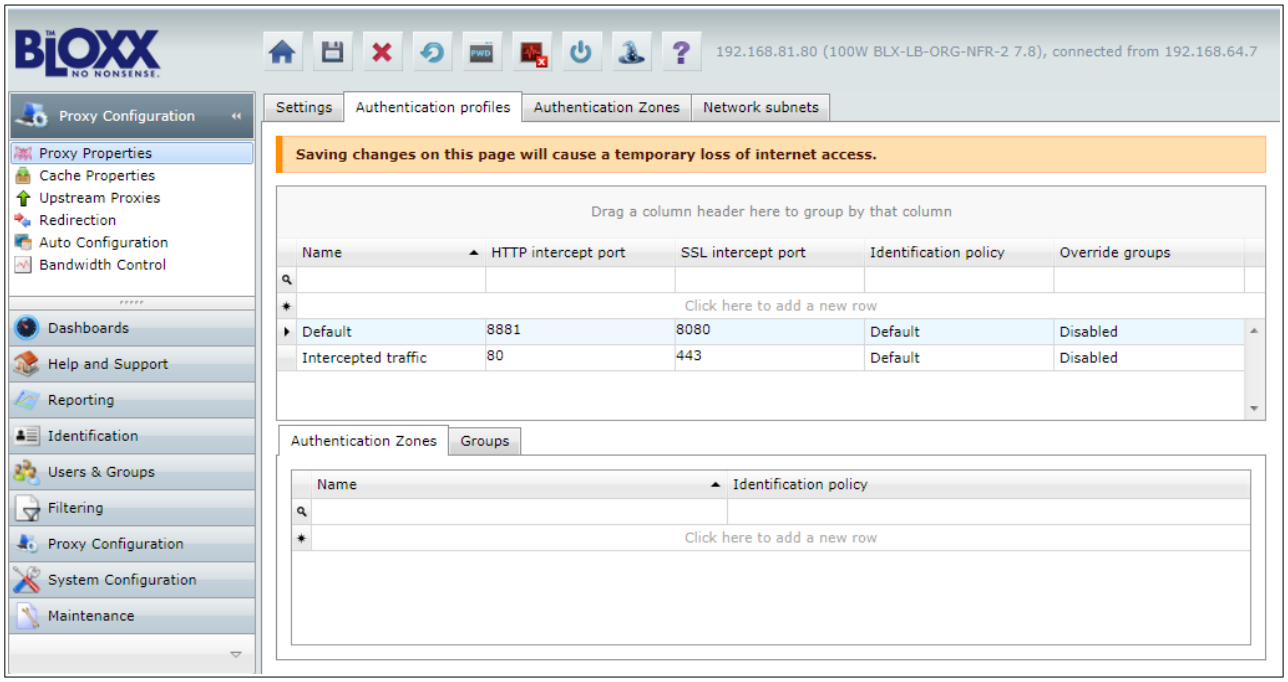
Web Filter Operating Mode

The Bloxx Web Filter can easily be configured for Explicit Proxy Mode by un-checking (disabling) the *Enable intercepting mode* check-box as shown below:



Proxy Port Configuration

The required proxy port can be set as shown below:



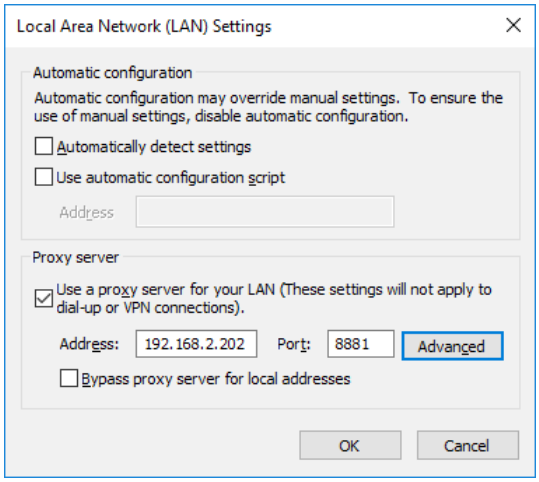
Note: The default proxy port for Bloxx Web Filters is 8881.

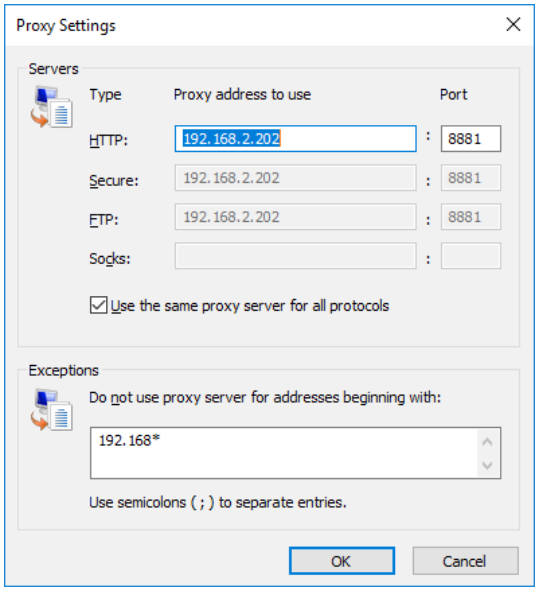
Client Configuration

Client browser settings must be set so that browsers connect via the VIP. In a Microsoft based LAN environment, this is typically achieved using AD group policy.

> Note: Depending on your requirements, it may be necessary to use an FQDN rather than an IP address for the Proxy server address. If you use an FQDN, make sure you have a valid DNS configuration that correctly resolves the hostname.

Browser Network Settings:

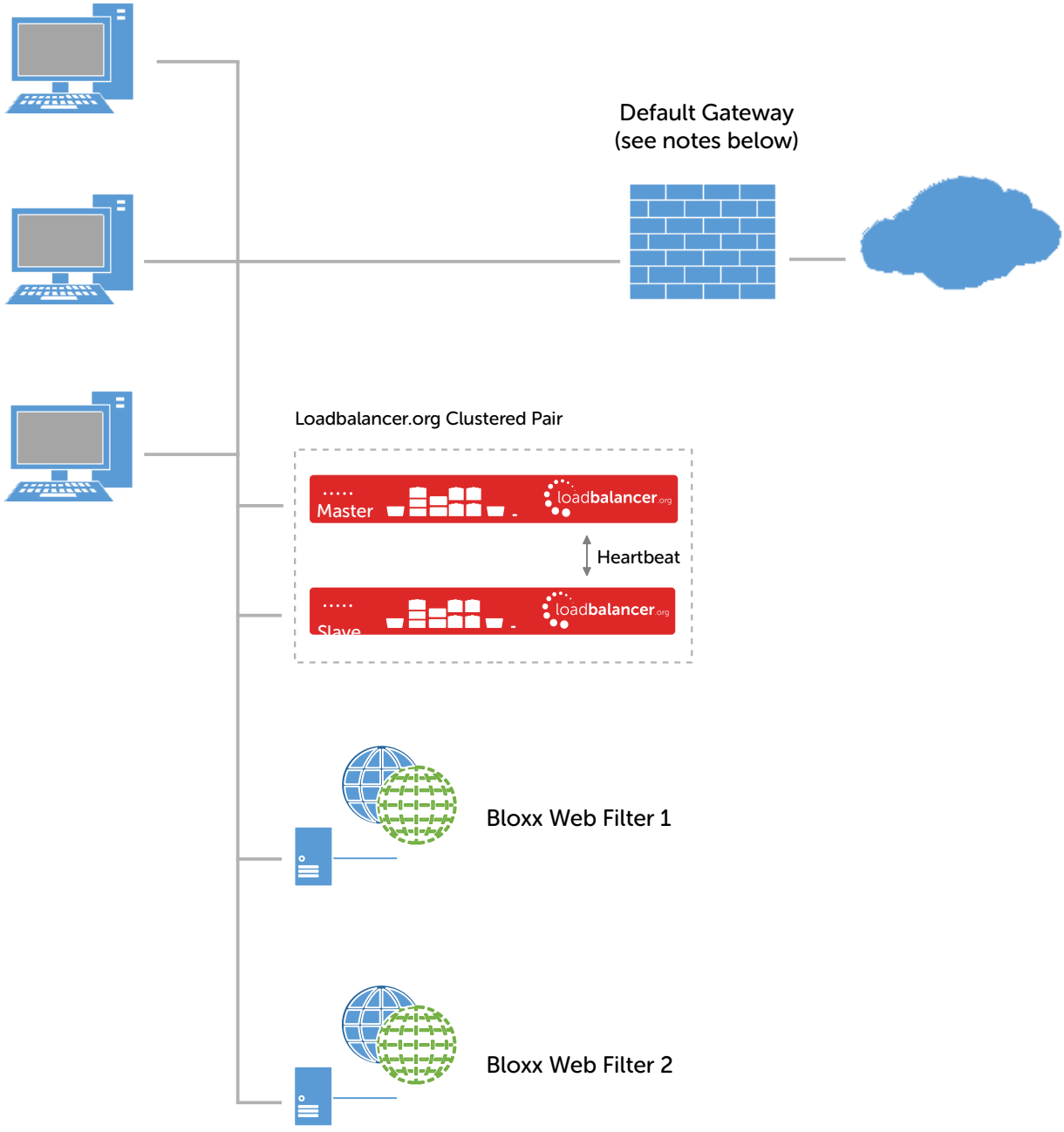




> Note: The configuration above assumes that Bloxx SSL Intercept has been licensed and installed.

12. Option 2 - Transparent Routed Proxy Mode

Deployment Architecture



Notes:

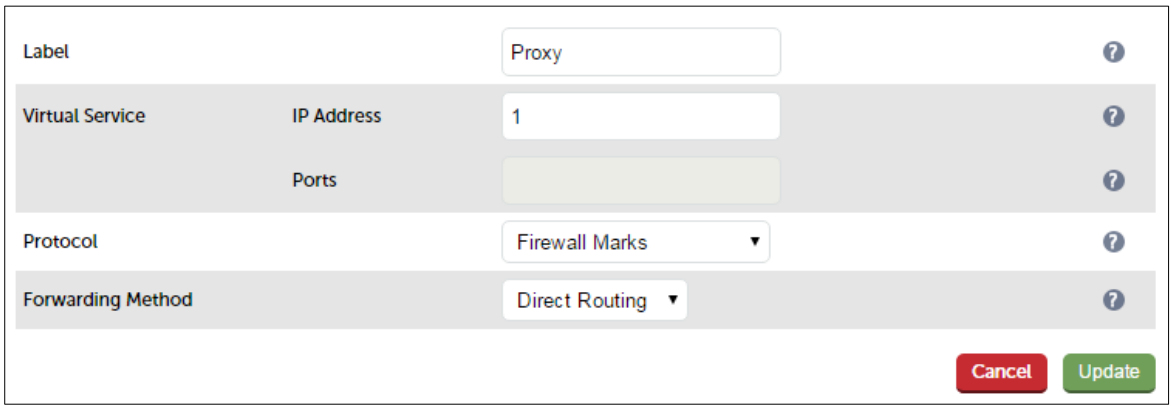
- Rules must be added to the router/firewall so that the required traffic (typically HTTP & HTTPS on port 80 & 443) is sent transparently to the load balancer, please see page 29 for example rules for a Linux router
- As with Explicit Proxy Mode, the load balancer is configured in Layer 4 DR mode
- Firewall rules must be added to the load balancer to transparently send traffic to the Web Filters (see page 27)

- 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 slave unit is covered in section 1 of the Appendix on page 32

Load Balancer Configuration

Create The Virtual Service (VIP)

1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Virtual Services*
2. Click **Add a New Virtual Service**
3. Enter the following details:



4. Enter an appropriate label (name) for the VIP, e.g. **Proxy**
5. Change the *Virtual Service IP address* field to **1**

> Note: This is the reference number for the 'Firewall Mark' . The same reference number is used when configuring the firewall rules – please see page 27 for more details.

6. Clear the *Virtual Service Ports* field, the ports are defined in the firewall rules on page 27
7. Ensure that *Protocol* is set to **Firewall Marks**

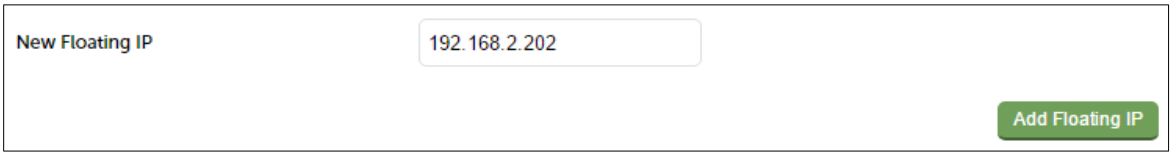
> Note: The ports field will be disabled when this is done.

8. Ensure that *Forwarding Method* is set to **Direct Routing**
9. Click **Update**
10. Now click **Modify** next to the newly created VIP
11. Ensure *Persistence* is enabled and set *Persistence Timeout* to **3600** (i.e. 1 hour)

12. Under the *Health Checks* section change *Check Type* to **Ping Server**
13. Click **Update**

Add The Floating IP

1. Using the WebUI, navigate to: *Cluster Configuration > Floating IPs*



2. Enter an appropriate IP address for the Virtual Service, e.g. **192.168.2.202**
3. Click **Add Floating IP**

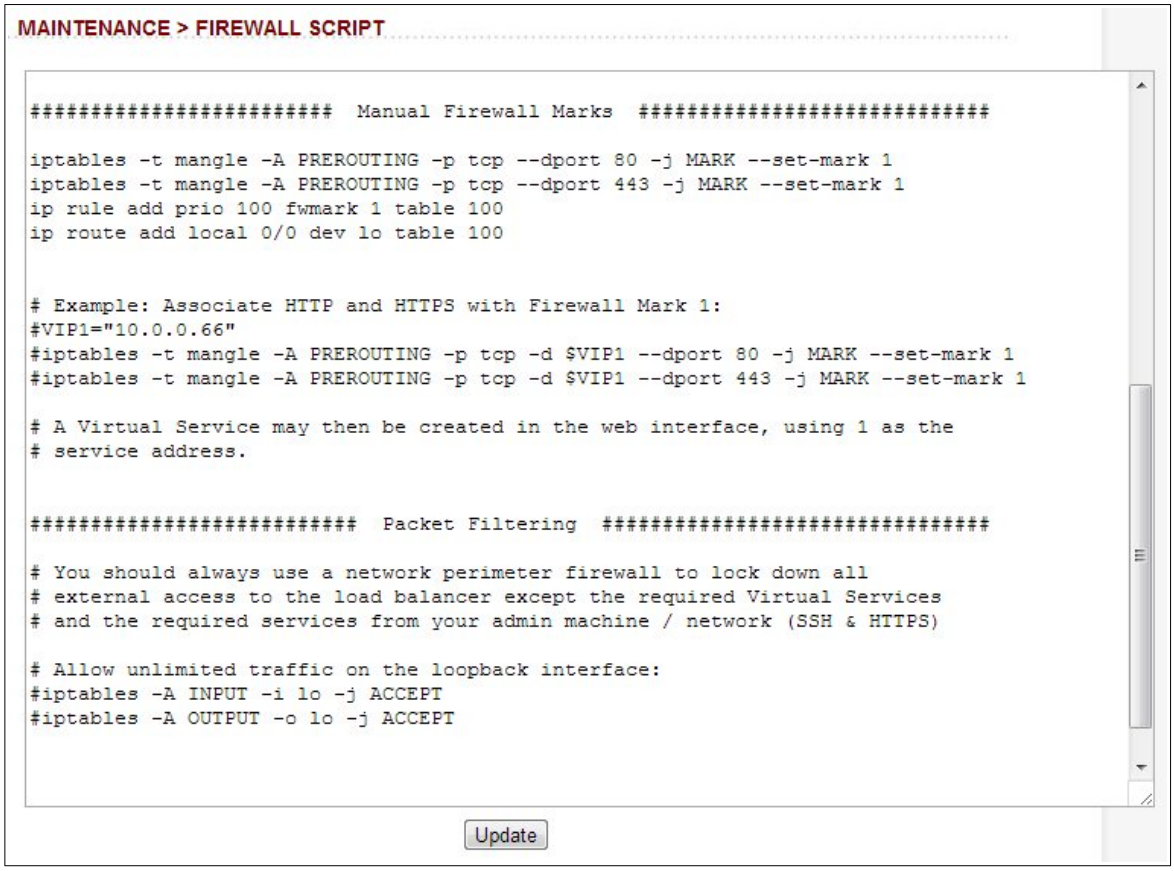
Configure Appliance Firewall Rules

Note: The *Firewall Script* page is locked by default on newer Loadbalancer.org appliances as part of "Secure Mode", which makes applying the changes described below impossible.
To enable editing of the firewall script, navigate to *Local Configuration > Security*, set *Appliance Security Mode* to **Custom**, and click the **Update** button to apply the change. Editing the *Firewall Script* page will then be possible.

1. Using the WebUI, navigate to: *Maintenance > Firewall Script*
2. Scroll down to the Firewall Marks section
3. Add the following lines to this section as shown in the screen shot below:

```
iptables -t mangle -A PREROUTING -p tcp --dport 80 -j MARK --set-mark 1
iptables -t mangle -A PREROUTING -p tcp --dport 443 -j MARK --set-mark 1
ip rule add prio 100 fwmark 1 table 100
ip route add local 0/0 dev lo table 100
```

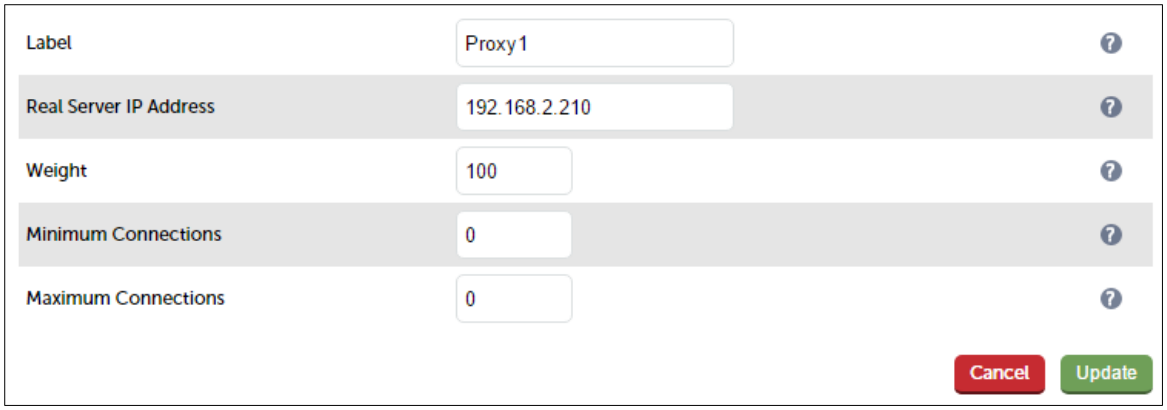
Note: Please see section 2 in the Appendix if you intend to forward ALL traffic to the Web Filters.



4. Click **Update**

Define The Real Servers (RIPs)

1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Real Servers*
2. Click **Add a new Real Server** next to the newly created VIP



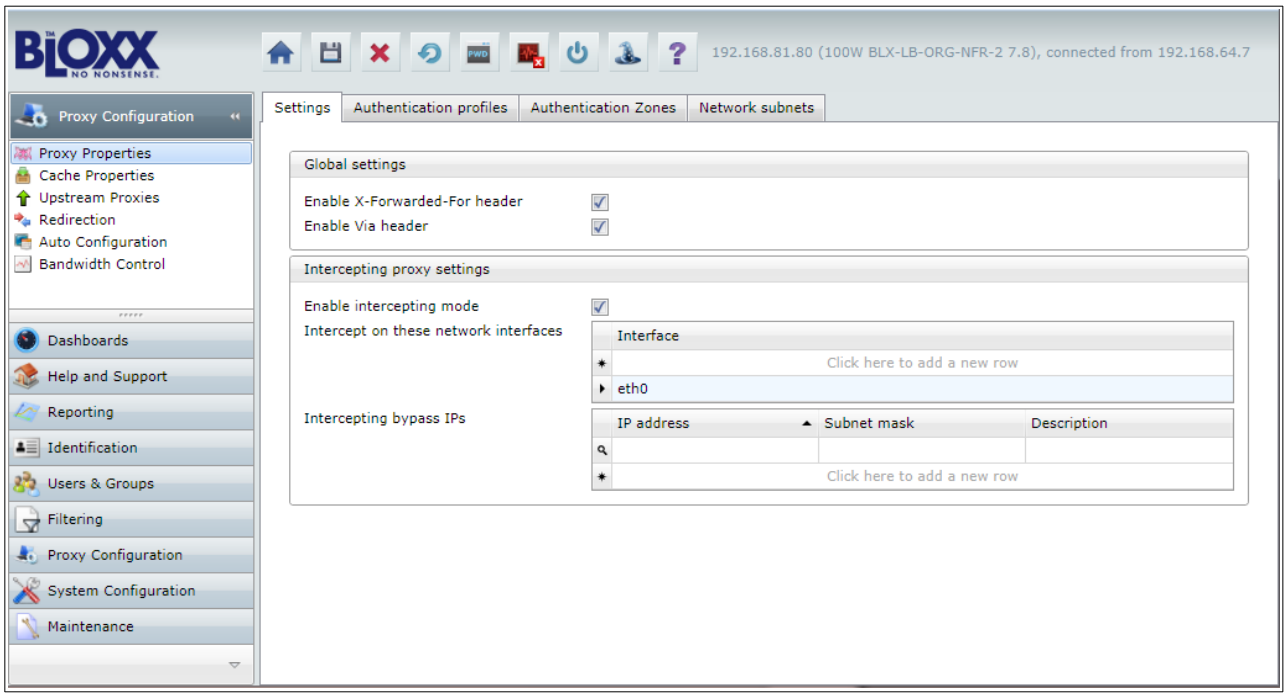
3. Enter the following details:
4. Enter an appropriate label (name) for the first Web Filter, e.g. **Proxy1**
5. Change the *Real Server IP Address* field to the required IP address, e.g. **192.168.2.210**

6. Click **Update**
7. Repeat the above steps to add your other Web Filter(s)

Web Filter Configuration

Web Filter Operating Mode

The Bloxx Web Filter can easily be configured for Transparent Proxy Mode by checking (enabling) the *Enable intercepting mode* check-box as shown below:



> Note: When using Transparent Routed Proxy Mode, it's not necessary to modify the Web Filter to accept traffic destined for the VIP, this is only required when using Explicit Proxy Mode.

Router/Default Gateway Configuration

Depending on your network configuration, rules must be added to the router/default gateway so that all required traffic (typically HTTP & HTTPS on port 80 & 443) is sent to the floating IP address on the load balancer. The load balancer then distributes this traffic between the Web Filters. The example shown below is for a Linux based router:

Example iptables rules for a Linux based router:

```
SUBNET="192.168.2.0/24"
```

```
FWMARK="5"
TABLE="10"
LOADBALANCER ="192.168.2.202"
iptables -t mangle -A PREROUTING -s $SUBNET -p tcp -m tcp --dport 80 -
j MARK --set-mark $FWMARK
iptables -t mangle -A PREROUTING -s $SUBNET -p tcp -m tcp --dport 443
-j MARK --set-mark $FWMARK
ip route add default via $LOADBALANCER dev eth3 table $TABLE
ip rule add fwmark $FWMARK table $TABLE
```

This example uses policy routing via firewall marks. This works by first selecting and marking the packets we want to be sent to the Web Filter, i.e. all packets on port 80 & 443. Then, when the kernel goes to make a routing decision, the marked packets aren't routed using the normal routing table, instead via table 10 in this case. Table 10 has only one entry: route packets to the Web Filter.

Note: This is required when no changes have been made to the clients default gateway settings.

Client Configuration

If rules are configured on the router as described in the section above, no client change are required. If such rules are not configured, then the default gateway on the client PCs must be modified to be the load balancer.

13. Testing & Validation

To verify that the traffic is passing through the load balancer correctly the following reporting options can be used:

System Overview

Reports > Layer 4 Status

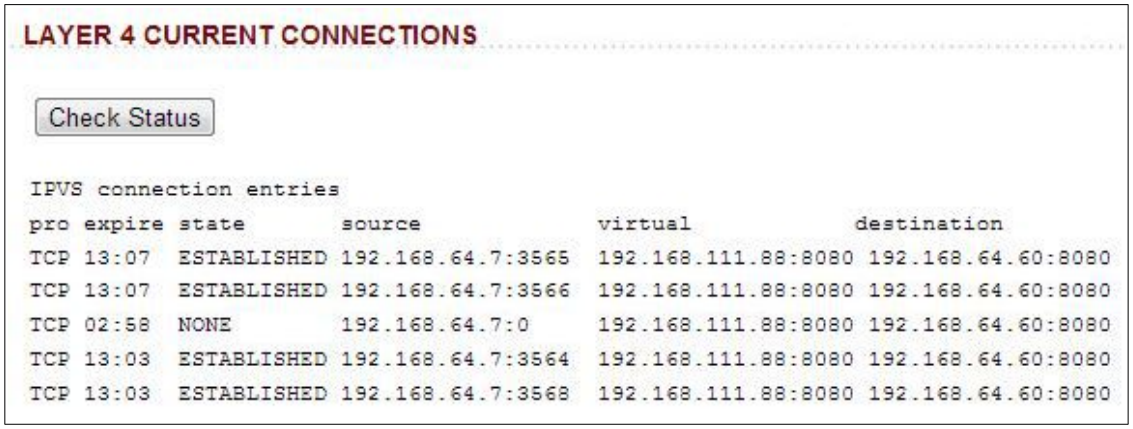
Reports > Layer 4 Current Connections

Several reporting and dashboard options are also available on the Web Filter, for more details please refer to the Bloxx Web Filter documentation.

Layer 4 – Current Connections

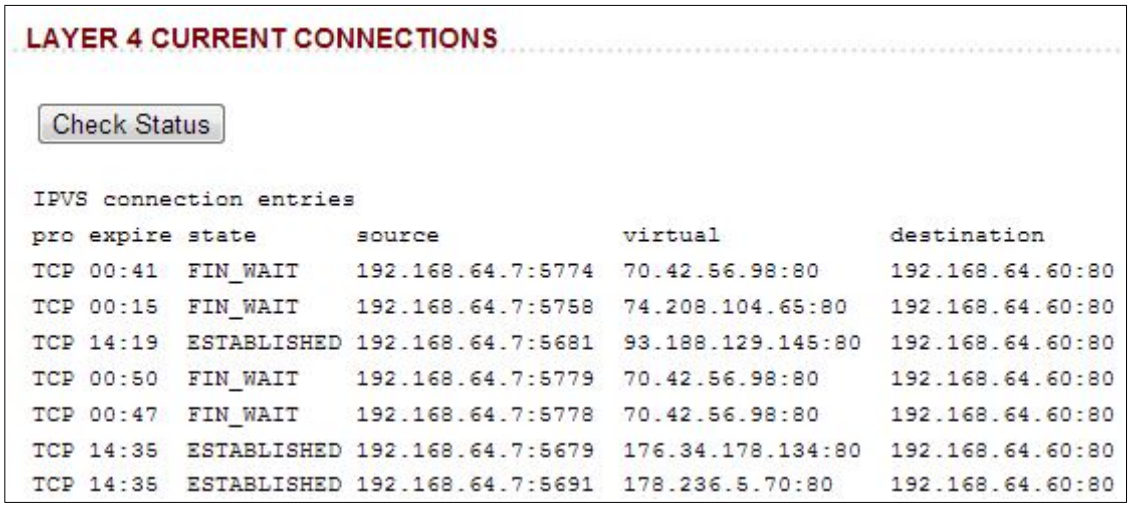
Explicit Proxy Mode

The example screen shot below illustrates that the test client (192.168.64.7) sends requests to the VIP (192.168.111.88), the load balancer then forwards the request onto the Web Filter (192.168.64.60).



Transparent Mode

The example screen shot below illustrates the difference when running in transparent mode.



Many reporting and dashboard options are also available in the Bloxx Web Filter user interface. For more details please refer to the appropriate Bloxx documentation.

14. 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.

15. Further Documentation

The Administration Manual contains much more information about configuring and deploying the appliance. It's available here: http://pdfs.loadbalancer.org/loadbalanceradministrationv8.pdf

16. Conclusion

Loadbalancer.org appliances provide a very cost effective solution for highly available load balanced Bloxx Web Filter environments.

17. Appendix

1 – Clustered Pair Configuration – Adding a Slave Unit

If you initially configured just the master unit and now need to add a slave - our recommended procedure, please refer to the relevant section below for more details:

Note: A number of settings are not replicated as part of the master/slave pairing process and therefore must be manually configured on the slave appliance. These are listed below:

- Hostname & DNS settings
- Network settings including IP addresses, bonding configuration and VLANs
- Routing configuration including default gateways and static routes
- Date & time settings
- Physical – Advanced Configuration settings including Internet Proxy IP address & port, Firewall table size, SMTP relay and Syslog server
- SNMP settings
- Graphing settings
- Firewall Script & Firewall Lockdown Script settings
- Software updates

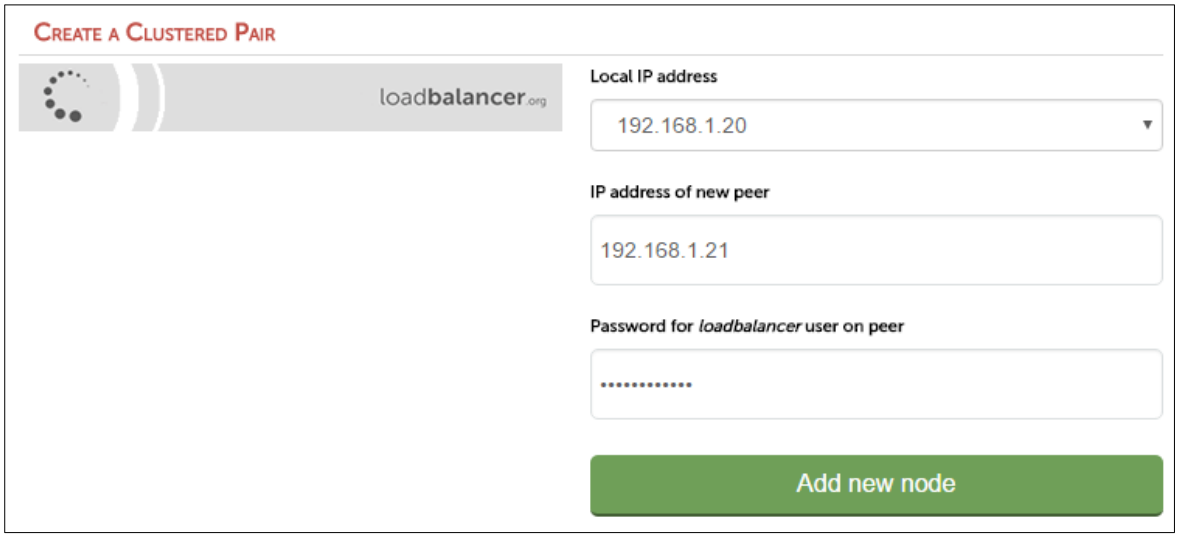
Version 7:

Please refer to **Chapter 8 – Appliance Clustering for HA** in the v7 Administration Manual.

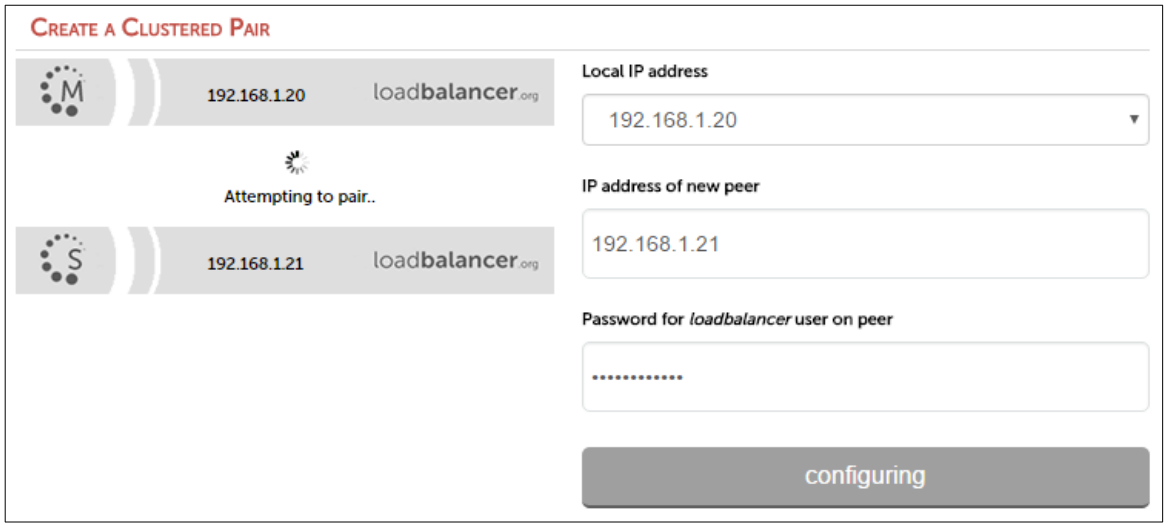
Version 8:

To add a slave node – i.e. create a highly available clustered pair:

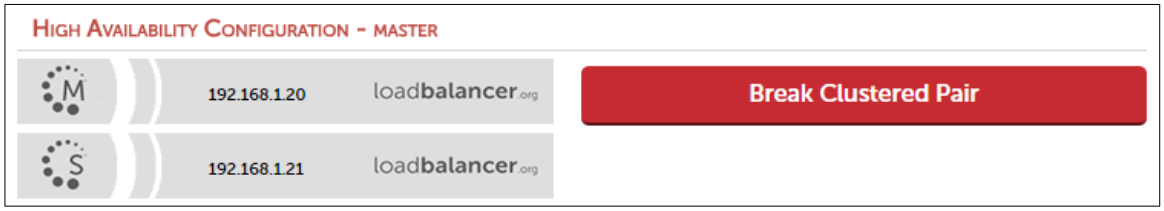
- Deploy a second appliance that will be the slave and configure initial network settings
- Using the WebUI, navigate to: *Cluster Configuration > High-Availability Configuration*



- Specify the IP address and the *loadbalancer* users password (the default is 'loadbalancer') for the slave (peer) appliance as shown above
- Click **Add new node**
- The pairing process now commences as shown below:



- Once complete, the following will be displayed:



- 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 master appliance will also automatically restart heartbeat on the slave appliance.

Note: Please refer to chapter 9 – Appliance Clustering for HA in the Administration Manual for more detailed information on configuring HA with 2 appliances.

2 – Modified Transparent Mode Firewall Rules

If ALL traffic is to be forwarded to the Web Filters, the firewall rules below should be used rather than the rules on page 27 , i.e.:

Replace:

```
iptables -t mangle -A PREROUTING -p tcp --dport 80 -j MARK --set-mark 1
iptables -t mangle -A PREROUTING -p tcp --dport 443 -j MARK --set-mark 1
ip rule add prio 100 fwmark 1 table 100
ip route add local 0/0 dev lo table 100
```

With:

```
iptables -t mangle -A PREROUTING -p tcp -j MARK --set-mark 1
iptables -t mangle -A PREROUTING -p udp -j MARK --set-mark 1
iptables -t mangle -A PREROUTING -p tcp -d <LB-IP> -j MARK --set-mark 2
iptables -t mangle -A PREROUTING -p udp -d <LB-IP> -j MARK --set-mark 2
ip rule add prio 100 fwmark 1 table 100
ip route add local 0/0 dev lo table 100
```

Notes:

- **<LB-IP>** should be replaced with the base IP address of the load balancer (typically eth0), this is the address used by heartbeat and for administration purpose
- If these modified firewall rules are used, then either the default gateway for client PC's should be changed to be the load balancer, or the rules on the router should be changed to forward all traffic to the load balancer
- This will only work for TCP and UDP traffic. So for example, ICMP and some VPN technologies will not work because the load balancer only supports TCP and UDP.

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

18. Document Revision History

Version	Date	Change	Reason for Change	Changed By
1.4.0	6 September 2019	Styling and layout	General styling updates	RJC
1.4.1	17 January 2020	Added note explaining how to disable "Secure Mode" to unlock the firewall script page	Required update	RJC
1.4.2	26 August 2020	New title page Updated Canadian contact details	Branding update Change to Canadian contact details	AH

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 personalised support.

United Kingdom

Loadbalancer.org Ltd.
Compass House, North Harbour
Business Park, Portsmouth, PO6 4PS
UK:+44 (0) 330 380 1064
sales@loadbalancer.org
support@loadbalancer.org

Canada

Loadbalancer.org Appliances Ltd.
300-422 Richards Street, Vancouver,
BC, V6B 2Z4, Canada
TEL:+1 866 998 0508
sales@loadbalancer.org
support@loadbalancer.org

United States

Loadbalancer.org, Inc.
4550 Linden Hill Road, Suite 201
Wilmington, DE 19808, USA
TEL: +1 833.274.2566
sales@loadbalancer.org
support@loadbalancer.org

Germany

Loadbalancer.org GmbH
Tengstraße 2780798,
München, Germany
TEL: +49 (0)89 2000 2179
sales@loadbalancer.org
support@loadbalancer.org