Load Balancing Trend Micro
Interscan Web Security Gateway
v1.4.2

Deployment Guide
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1. About this Guide

This guide details the steps required to configure a load balanced Trend Micro InterScan Web Gateway environment utilizing Loadbalancer.org appliances. It covers the configuration of the load balancers and also any Trend Micro InterScan Web Gateway 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 Trend Micro InterScan Web Gateways. The complete list of models is shown below:

<table>
<thead>
<tr>
<th>Discontinued Models</th>
<th>Current Models *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise R16</td>
<td>Enterprise R20</td>
</tr>
<tr>
<td>Enterprise VA R16</td>
<td>Enterprise MAX</td>
</tr>
<tr>
<td>Enterprise VA</td>
<td>Enterprise 10G</td>
</tr>
<tr>
<td>Enterprise R320</td>
<td>Enterprise 40G</td>
</tr>
<tr>
<td></td>
<td>Enterprise Ultra</td>
</tr>
<tr>
<td></td>
<td>Enterprise VA R20</td>
</tr>
<tr>
<td></td>
<td>Enterprise VA MAX</td>
</tr>
<tr>
<td></td>
<td>Enterprise AWS **</td>
</tr>
<tr>
<td></td>
<td>Enterprise AZURE **</td>
</tr>
<tr>
<td></td>
<td>Enterprise GCP **</td>
</tr>
</tbody>
</table>

* For full specifications of these models please refer to: [http://www.loadbalancer.org/products/hardware](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. Trend Micro Web InterScan Web Gateway Appliances Supported

- All versions

Note that the Trend Micro InterScan Web Security Virtual Appliance (v6.5) was used in the lab environment for this guide
5. Benefits of Implementing a Load Balancer
Implementing Loadbalancer.org appliances enables multiple Trend Micro InterScan Web Gateways to be deployed in a cluster. This provides the following key benefits:

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

6. Load Balancer Configuration Options
The following sections describe the various load balancer deployment modes and persistence options that are used when load balancing Web Gateways.

**Deployment Modes**

**Layer 4 (Recommended)**

**DR Mode - Direct Server Return Mode (Recommended)**
In this mode, traffic from the client to the Web Gateway 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 Gateway 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 Gateways to be the load balancer or by configuring a static route on the Web Gateways 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 Gateways) 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 Gateway load balancing deployments.

Persistence / Server Affinity

Persistence may or may not be required and depends on the specific Web Gateway 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 Gateway.

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 Web Gateway 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 Gateways.

7. Web Gateway Deployment Modes

There are two implementation methods that are typically used when deploying with a load balancer – these are 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 between the back-end Web Gateways. Trend Micro refer to this mode as Forward Proxy Mode. Please refer to the section starting on page 11 for configuration details.

2 – Transparent Routed Proxy Mode

With this mode, client requests must be routed to the load balancer/Web Gateway cluster. This can be achieved by adding rules to the default gateway device. Rules are configured for HTTP & HTTPS traffic on ports 80 and 443. Please refer to the section starting on page 27 for configuration details.
Note: When configuring the Web Gateways, **Simple Transparency Mode** should be selected. Please refer to page 31 for more details. In this mode it’s not possible to filter HTTPS traffic. This is because SSL cannot be proxied transparently. SSL authenticates both sides of the connection and if a proxy is in the middle, then both sides try to authenticate to the proxy which is incorrect and therefore the connection fails. We recommend using Explicit Proxy Mode rather than Transparent Routed Proxy Mode when possible due to this limitation.

8. Summary of Deployment Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Web Gateway Mode</th>
<th>Load Balancer Mode</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1A</td>
<td>Forward Proxy Mode</td>
<td>DR Mode</td>
<td>The Web Gateways must be configured to accept traffic for the VIP. Please refer to page 11 for configuration details.</td>
</tr>
<tr>
<td>(Recommended)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 1B</td>
<td>Forward Proxy Mode</td>
<td>NAT Mode</td>
<td>The load balancer must be set as the default gateway for the Web Gateways. Please refer to page 16 for configuration details.</td>
</tr>
<tr>
<td>Option 1C</td>
<td>Forward Proxy Mode</td>
<td>NAT Mode</td>
<td>A static route must be configured on the Web Gateways to send client return traffic back via the load balancer. Please refer to page 21 for configuration details.</td>
</tr>
<tr>
<td>Option 2</td>
<td>Simple Transparency Mode</td>
<td>DR Mode</td>
<td>Firewall rules must be added to the load balancer to transparently send traffic to the Web Gateways. Please refer to page 27 for configuration details.</td>
</tr>
</tbody>
</table>
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 35.
10. 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 26).
- The load balancer is configured in one-arm Layer 4 DR mode
- The Trend Micro Web Gateways must be configured to accept traffic for the VIP (see page 13)
- 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 35
- For more information on Trend Micro Web Gateway deployment options please refer to this URL

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:

   ![Virtual Service Configuration](image)

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 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. 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 Gateway, 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 Gateway(s)

**Web Gateway Configuration**

Note: By default the password for admin, root, and enable accounts is **adminIWSS85**. This can also be set during the installation process when IWSVA is deployed from the ISO file.

**Modify the Web Gateways 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 Gateways. 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 Gateway 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 Gateway 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*
Configuring the Trend Micro Appliance

1. Login as root either at the console or using a remote SSH session
2. Edit the file /etc/rc.local using vi, vim or a remote editor such as the one included in WinSCP
3. Then add the following additional line to this file, setting the VIP address as required, as shown below:

```
iptables -t nat -A PREROUTING -p tcp -d <VIP address> -j REDIRECT
```
4. Reboot the Web Gateway to apply the new setting

Finalize Settings
Now refer to the section “Configuration Settings Common to Options 1A, 1B & 1C” on page 25 to finalize Web Gateway 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 26).
- 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 Gateways.
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 17).

- 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 35.
- For more information on Trend Micro Web Gateway deployment options please refer to this URL

Load Balancer Configuration

Configure Network Settings

Two interfaces are required. Typically eth0 is used for the internal (Web Gateway) 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:

![IP Address Assignment](image)

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 Gateways

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 Gateways. This will 'float' between the master and slave units in the event of a failover or failback. This ensures that the Web Gateways 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

   ![New Floating IP](image)

   - Define a suitable IP address for the default gateway, e.g. 192.168.4.205
   - 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:

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

As mentioned, Option 1B requires the default gateway on the Web Gateways 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 17 details how to create the Floating IP.

To set the default gateway using the WebUI (repeat for all Web Gateways):

1. Login to the WebUI of the Web Gateway
2. Navigate to: Administration > Network Configuration > Network Interface
3. Define the required Gateway address, e.g. 192.168.4.205
4. Click Save

Finalize Settings

Now refer to the section “Configuration Settings Common to Options 1A, 1B & 1C” on page 25 to finalize Web Gateway 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 26).
- 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 Gateways 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 22).
• This method is more efficient & faster than Option 1B since the Web Gateways 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 35

• For more information on Trend Micro Web Gateway deployment options please refer to this URL

Load Balancer Configuration

Configure Network Settings
Two interfaces are required. Typically eth0 is used for the internal (Web Gateway) 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:

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

16. Configure the required IP address for eth0, e.g. 192.168.4.200/24
17. Configure the required IP address for eth1, e.g. 192.168.2.200/24
18. Click Configure Interfaces

Define a Floating IP to be used as the gateway for the Static Route on the Web Gateways
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 Gateways. This will 'float' between the master and slave units in the event of a failover or failback. This ensures that the Web Gateways 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:

   - **Label** (name) for the VIP, e.g. **Proxy**
   - **Virtual Service IP address** to the required IP address, e.g. **192.168.2.202**
   - **Virtual Service Ports** to the required port, e.g. **8080**
   - **Protocol** is set to **TCP**
   - **Forwarding Method** is set to **NAT**
4. Click **Update**
5. Now click **Modify** next to the newly created VIP
6. Ensure **Persistence** is enabled and set **Persistence Timeout** to **3600** (i.e. 1 hour)
7. 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 Gateway, 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 Gateway(s)

**Web Gateway Configuration**

**Configure a Static Route**

As mentioned, Option 1C requires a Static Route to be defined on the Web Gateways 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 22 details how to create the Floating IP.

To define a Static Route using the WebUI (repeat for all Web Gateways):

1. Login to the WebUI of the Web Gateway
2. Navigate to: Administration > IP Address Settings
3. Click Add, the Add Static Route screen appears
4. Enter a value for the Network ID, e.g. 192.168.2.0
5. Enter a value for the Netmask, e.g. 255.255.255.0
6. Enter a value for the Router, e.g. 192.168.4.205
7. Click Save

**Finalize Settings**

Now refer to the section "Configuration Settings Common to Options 1A, 1B & 1C" below to finalize Web Gateway 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 Gateway Operating Mode

The Trend Micro Web Gateway can easily be configured for Proxy Mode using the deployment wizard as shown below:

Proxy Port Configuration

The required proxy port (8080 is the default) can also be set using the deployment wizard as shown below:
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:
11. 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 32 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 Gateways (see page...
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 35.

For more information on Trend Micro Web Gateway deployment options please refer to this URL.

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:

   ![Virtual Service Configuration]

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 29 for more details.

6. Clear the Virtual Service Ports field, the ports are defined in the firewall rules on page 29
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 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:

```bash
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 Gateways.
• 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:

![Real Server Configuration](image)

4. Enter an appropriate label (name) for the first Web Gateway, 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 Gateway(s)

Web Gateway Configuration

Note: By default the password for admin, root, and enable accounts is adminIWSS85. This can also be set during the installation process when IWSVA is deployed from the ISO file.

Web Gateway Operating Mode

The Trend Micro Web Gateway can easily be configured for Transparent Mode by following the steps below:

Note: These steps must be followed on all Gateways.

Step 1
Use the Deployment Wizard to configure the appliance in Simple Transparency Mode as shown below:
Step 2

- Login as root either at the console or using a remote ssh session
- Edit the file `/etc/rc.local` using `vi`, `vim` or a remote editor such as the one included in WinSCP
- Then add the following additional lines to this file as shown below:

```
iptables -t nat -A PREROUTING -p tcp --dport 80 -j REDIRECT --to-port 8080
iptables -t nat -A PREROUTING -p tcp --dport 443 -j REDIRECT --to-port 8443
```

Note: When using transparent routed mode, it’s not necessary to modify the Web Gateway 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 Gateways. 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
```
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 Gateway, 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 Gateway.

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.

**12. 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**

Many reporting and dashboard options are also available in the Trend Micro user interface. For more details please refer to the appropriate Trend Micro 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 Gateway (192.168.64.60).
Transparent Mode

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

<table>
<thead>
<tr>
<th>IPVS connection entries</th>
<th>source</th>
<th>virtual</th>
<th>destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCP 00:15 FIN_WAIT</td>
<td>192.168.64.7:5774</td>
<td>74.209.104.66:80</td>
<td>192.168.64.60:80</td>
</tr>
<tr>
<td>TCP 14:19 ESTABLISHED</td>
<td>192.168.64.7:5681</td>
<td>93.188.129.145:80</td>
<td>192.168.64.60:80</td>
</tr>
<tr>
<td>TCP 00:50 FIN_WAIT</td>
<td>192.168.64.7:5779</td>
<td>70.42.56.98:80</td>
<td>192.168.64.60:80</td>
</tr>
<tr>
<td>TCP 00:47 FIN_WAIT</td>
<td>192.168.64.7:5778</td>
<td>70.42.56.98:80</td>
<td>192.168.64.60:80</td>
</tr>
<tr>
<td>TCP 14:35 ESTABLISHED</td>
<td>192.168.64.7:5679</td>
<td>176.34.178.134:80</td>
<td>192.168.64.60:80</td>
</tr>
<tr>
<td>TCP 14:35 ESTABLISHED</td>
<td>192.168.64.7:5691</td>
<td>176.236.5.70:80</td>
<td>192.168.64.60:80</td>
</tr>
</tbody>
</table>

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

13. 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.
14. Further Documentation

15. Conclusion
Loadbalancer.org appliances provide a very cost effective solution for highly available load balanced Trend Micro InterScan Web Gateway environments.

16. 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.
2 – Modified Transparent Mode Firewall Rules
If ALL traffic is to be forwarded to the Web Gateways, the firewall rules below should be used rather than the rules on page 29, 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.
17. Document Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Change</th>
<th>Reason for Change</th>
<th>Changed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4.0</td>
<td>6 August 2019</td>
<td>Styling and layout</td>
<td>General styling updates</td>
<td>RJC</td>
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<tr>
<td>1.4.1</td>
<td>17 January 2020</td>
<td>Added note explaining how to disable &quot;Secure Mode&quot; to unlock the firewall script page</td>
<td>Required update</td>
<td>RJC</td>
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<tr>
<td>1.4.2</td>
<td>13 August 2020</td>
<td>New title page</td>
<td>Branding update</td>
<td>AH</td>
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<td></td>
<td></td>
<td>Updated Canadian contact details</td>
<td>Change to Canadian contact details</td>
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</table>
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.

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