Contents

About this Guide.................................................................3
Related Documentation.......................................................3
Load Balanced Ports..........................................................3
Load Balancer Configuration...................................................3
  Operation Mode..............................................................3
  Deployment concept.........................................................4
Deploy the Loadbalancer.org Appliance....................................4
Accessing The Appliance WebUI...........................................4
Configuration Steps............................................................5
  Step 1 – Create the Virtual Service (VIP)..............................5
  Step 2 – Define The Real Servers (RIPs)..............................6
  Step 3 – Solve The ARP Problem.....................................7
Testing & Verification..........................................................7
Related Quick Reference Guides...........................................8
Loadbalancer.org Technical Support......................................8
Document Revision History..................................................9
About this Guide
This guide provides a quick reference for setting up SIP load balancing using Loadbalancer.org appliances.

Related Documentation
For additional information about the Loadbalancer.org appliance, please also refer to the following documents:

- Quick Start Guide
- Administration Manual

Load Balanced Ports

<table>
<thead>
<tr>
<th>Port</th>
<th>Use</th>
<th>Transport Layer Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>5060</td>
<td>non-encrypted SIP</td>
<td>UDP &amp; TCP</td>
</tr>
<tr>
<td>5061</td>
<td>encrypted SIP</td>
<td>UDP &amp; TCP</td>
</tr>
</tbody>
</table>

Note: The exact port requirements depend on how the VoIP system is configured. This guide includes both TCP & UDP ports 5060 and 5061 for completeness.

Load Balancer Configuration

Operation Mode
The load balancer is configured in single-arm layer 4 DR (Direct Return) mode. This mode offers very high performance since return traffic passes directly from the SIP Servers back to the clients by-passing the load balancer. DR mode works by changing the MAC address on the fly to match the relevant SIP Server.

Since packets will still have the IP address of the VIP, the SIP Servers must be configured to accept this traffic, but must also be configured to not reply to ARP requests for this address. For more details, please refer to the section 'Solving the ARP Problem' on page 7.
Deployment Concept

Deploy The Loadbalancer.org Appliance
Deploy the Loadbalancer.org appliance as detailed in the Quick Start Guide.

Accessing The Appliance WebUI
Using a browser, navigate to the appliance's IP address on HTTPS port 9443, i.e.


Note: For HTTPS connections you'll receive a warning about the certificate as it's a self signed cert not related to an Internet based CA.

Login to the WebUI:

Username: loadbalancer
Password: <configured-during-network-setup-wizard>

Note: To change the password for the 'loadbalancer' account, use the WebUI option: Maintenance > Passwords.
Once logged in, the WebUI is displayed:

Configuration Steps

Step 1 – Create The Virtual Service (VIP)
Follow the steps below to create a new VIP – this is the IP address that clients will connect to.

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

![Virtual Service Configuration](image)

3. Specify an appropriate Label (name) for the Virtual Service, e.g. SIP
4. Set the Virtual Service IP Address to the required IP address, e.g. 192.168.10.10.
5. Set the Ports field as required, e.g. 5060,5061 for all SIP ports.

   **Note:** If you only require a single port – e.g. 5060, just specify **5060** rather than **5060,5061** in the Ports field.

6. Set the Protocol to TCP/UDP.
7. Set the Forwarding Method to Direct Routing.
8. Click **Update** to create the Virtual Service.

---

**Step 2 – Define The Real Servers (RIPs)**

The Real Servers (i.e. the SIP servers) must now be associated with the VIP.

1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Real Servers* and click **Add a new Real Server** next to the newly created VIP
2. Enter the following details:
3. Enter an appropriate label for the RIP, e.g. SIP1
4. Change the Real Server IP Address field to the required address, e.g. 192.168.10.20
5. Click Update
6. Repeat the above steps to add your other SIP server(s)

Step 3 – Solve The ARP Problem
As mentioned previously, DR mode works by changing the MAC address of the inbound packets to match the Real Server selected by the load balancing algorithm. To enable DR mode to operate:

- Each Real Server must be configured to accept packets destined for both the VIP address and the Real Servers IP address (RIP). This is because in DR mode the destination address of load balanced packets is the VIP address, whilst for other traffic such as health-checks, administration traffic etc., it’s the Real Server’s own IP address (the RIP). The service/process (e.g. IIS) must also respond to both addresses.
- Each Real Server must be configured so that it does not respond to ARP requests for the VIP address – only the load balancer should do this.

Configuring the Real Servers in this way is referred to as ‘Solving the ARP problem’. The exact steps required depend on the particular OS being used. For full details, please refer to the Administration Manual and search for "Solving the ARP Problem".

Testing & Verification

Check Server State
Using the System Overview in the WebUI, verify that the VIP and associated RIPS are up (green) as shown in the example below:
Check Connectivity

Now test the load balancer by connecting clients to the VIP address (192.168.10.10 in this example configuration) rather than connecting users directly to the SIP servers.

Related Quick Reference Guides

The following guide may also be useful:

- [Load Balancing Asterix in AWS](#)

Loadbalancer.org 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](mailto:support@loadbalancer.org).
## 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>1.5.0</td>
<td>5 November 2019</td>
<td>Styling and layout</td>
<td>General styling updates</td>
<td>AH</td>
</tr>
<tr>
<td>1.5.1</td>
<td>3 June 2020</td>
<td>New title page</td>
<td>Branding update</td>
<td>AH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Updated Canadian contact details</td>
<td>Change to Canadian contact details</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Updated ‘Quick Start Guide’ hyperlink URL</td>
<td>Quick Start Guides have been amalgamated at a new location</td>
<td></td>
</tr>
<tr>
<td>1.5.2</td>
<td>8 July 2022</td>
<td>Changed the VIP configuration to use TCP/UDP rather than defining a Firewall Mark.</td>
<td>Simpler configuration steps utilizing updated appliance features.</td>
<td>RJC</td>
</tr>
</tbody>
</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.