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About this Guide
This guide provides a quick reference for setting up NTP 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>123</td>
<td>NTP</td>
<td>TCP &amp; UDP</td>
</tr>
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</table>

Load Balancer Configuration

Operation Mode
The load balancer is configured in layer 4 SNAT mode. This mode requires no Real Server changes, offers high performance and supports both TCP and UDP – a requirement for load balancing NTP servers.

NTP Server Health-check
A custom health-check is created which ensures that the NTP servers correctly respond to an actual NTP time request rather than relying on a simple TCP port connect.

Configuration Diagram
The following diagram shows that clients connect to the Virtual Service (VIP) on the load balancer rather than directly to one of the NTP servers.
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.
https://<IP-Address>:9443

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.

Use the following default credentials to login:

Username: loadbalancer
Password: loadbalancer

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 Custom External NTP Health-check
1. Using an editor, create a file named `NTP-check.sh` in `/var/lib/loadbalancer.org/check/`

   Note: This can be done using an editor on the appliance such as `vim` or `vi` if you're familiar with Linux, or by using the editor included with WinSCP. WinSCP is a free Windows utility that enables files in a Linux filesystem to be easily created, viewed and modified from a Windows PC/server. It's available here: [http://winscp.net/eng/download.php](http://winscp.net/eng/download.php)

   **Important**: Remote access is disabled by default on all recent versions of the load balancer. For more information, please refer to the section Appliance Security in our full Administration Manual.

2. Copy/paste the following into the file:

   ```bash
   #!/bin/bash
   # NTP Server Health Check
   
   # Script Variables
   CHECK_IP="$3"  # $3 is the variable assigned the real server IP
   CHECK_TIMEOUT="5"  # time out value
   
   # Run ntpdate with -q option to check the NTP server can provide the time
   ntpdate -q -t $CHECK_TIMEOUT $CHECK_IP
   if [ $? -eq 0 ]
   then
     exit 0
   else
     exit 10
   fi
   
3. Save the file
4. Set the file permissions of `NTP-check.sh` to 755. In WinSCP, right click the file, click properties and set the permissions as shown below:

   ![Permission](image.png)

   (this newly created health-check script will be used in Step 2 below when configuring the VIP)

Step 2 – Create The Virtual Service (VIP)
Create a new VIP as described below – this is where clients connect to rather than an NTP server directly.
1. Using the WebUI, navigate to: Cluster Configuration > Layer 4 – Virtual Services and click Add a New Virtual Service

2. Enter the following details:

3. Enter an appropriate label for the VIP, e.g. NTP-Cluster

4. Set the Virtual Service IP address field to the required IP address, e.g. 192.168.10.10

5. Set the Virtual Service Ports field to 123

6. Set the Protocol to TCP/UDP

7. Set the Forwarding Method to SNAT

8. Click Update

9. Click Modify next to the newly created VIP

10. Change Check Type to External Script

11. Set the External Script drop-down to NTP-check.sh – this was created in Step 1 above

12. Click Update

Step 3 – Define The Real Servers (RIPs)
The Real Servers (i.e. the NTP 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. **NTP1**
4. Change the **Real Server IP Address** field to the required address, e.g. **192.168.10.20**
5. Leave the other settings at their default values
6. Click **Update**
7. Repeat the above steps to add your other NTP server(s)

**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:

![System Overview](image)

**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 directly to an NTP server.

**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.
## Document Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Change</th>
<th>Reason for Change</th>
<th>Changed By</th>
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<tbody>
<tr>
<td>1.1.0</td>
<td>4 November 2019</td>
<td>Styling and layout</td>
<td>General styling updates</td>
<td>AH</td>
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<tr>
<td>1.1.1</td>
<td>28 August 2020</td>
<td>New title page&lt;br&gt;Updated Canadian contact details&lt;br&gt;Added explanatory note that remote access is now disabled by default</td>
<td>Branding update&lt;br&gt;Change to Canadian contact details&lt;br&gt;Remote access functionality removed from the product by default</td>
<td>AH</td>
</tr>
<tr>
<td>1.1.2</td>
<td>17th June 2021</td>
<td>Added required space in the health check script and updated script comments</td>
<td>Script would not run</td>
<td>RJC</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.

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