1. About this Guide

This guide details the steps required to configure a load balanced Storage Made Easy File Fabric environment utilizing Loadbalancer.org appliances. It covers the configuration of the load balancers and also any File Fabric 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 File Fabric. 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

- V8.3.8 and later

4. File Fabric Software Versions Supported

- File Fabric – version 1906.00 and later
5. Storage Made Easy File Fabric

Storage Made Easy provides an on-premises Enterprise File Fabric solution which is storage agnostic and can be used either with a single storage back-end or multiple public/private storage systems. In the event of the latter, the File Fabric unifies the view across all access clients and implements a common control and governance policies through the use of its cloud control features.

The product is supplied as a software ‘appliance’ which is run inside of a hypervisor and consists of a pre-configured, ‘hardened’ operating system (CentOS) and the File Fabric Application provided by Storage Made Easy.

6. Load Balancing File Fabric

Note: It’s highly recommended that you have a working File Fabric environment first before implementing the load balancer.

Load Balancing & HA Requirements
To deploy File Fabric as an HA deployment, 4 SME File Fabric instances are needed. When configured as per the Storage Made Easy guides, the topology will be as follows:

- 2 SME Web servers
- 2 SME SQL servers

Persistence (aka Server Affinity)
Load balancing File Fabric requires source IP address affinity. This is true for both the layer 4 and layer 7 based load balancing methods described in this document.

Virtual Service (VIP) Requirements
To provide load balancing and HA for File Fabric, the following VIPs are required:

- Web portal access
- SQL
- Memcache
- SFTP
Port Requirements
The following table shows the ports that are load balanced:

<table>
<thead>
<tr>
<th>Port</th>
<th>Protocols</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>TCP/HTTP</td>
<td>Web Portal Access over HTTP</td>
</tr>
<tr>
<td>443</td>
<td>TCP/HTTPS</td>
<td>Web Portal Access over HTTPS</td>
</tr>
<tr>
<td>3306</td>
<td>TCP/SQL</td>
<td>SQL Service</td>
</tr>
<tr>
<td>2200</td>
<td>TCP/SFTP</td>
<td>SFTP Service</td>
</tr>
<tr>
<td>11211</td>
<td>TCP/Memcache</td>
<td>Memcache Service</td>
</tr>
</tbody>
</table>

7. Deployment Concept

VIPs = Virtual IP Addresses

Note: The load balancer can be deployed as a single unit, although Loadbalancer.org recommends a clustered pair for resilience & high availability. Please refer to section 3 in the appendix on page 36 for more details on configuring a clustered pair.
8. Load Balancer Deployment Methods

The load balancer can be deployed in 4 fundamental ways: Layer 4 DR mode, Layer 4 NAT mode, Layer 4 SNAT mode, and Layer 7 SNAT mode.

For File Fabric, using a combination of layer 4 DR mode and layer 7 SNAT mode is recommended. It is also possible to only use layer 7 SNAT mode, however the performance of this setup is not as great and client source IP addresses are not passed through to the SME servers on the back end. Both of these setups are described below and are used for the configurations presented in this guide. For configuring using a combination of layer 4 DR mode and layer 7 SNAT mode please refer to the section starting on page 13, and for configuring using only layer 7 SNAT mode refer to the section starting on page 18.

Layer 4 DR Mode

One-arm direct routing (DR) mode is a very high performance solution that requires little change to your existing infrastructure.

Note: Kemp, Brocade, Barracuda & A10 Networks call this Direct Server Return and F5 call it N-Path.

- DR mode works by changing the destination MAC address of the incoming packet to match the selected Real Server on the fly which is very fast
- When the packet reaches the Real Server it expects the Real Server to own the Virtual Services IP address (VIP). This means that you need to ensure that the Real Server (and the load balanced application) respond to both the Real Servers own IP address and the VIP
- The Real Server should not respond to ARP requests for the VIP. Only the load balancer should do this. Configuring the Real Servers in this way is referred to as Solving the ARP Problem. Please refer to page 29 for more information
- On average, DR mode is 8 times quicker than NAT for HTTP, 50 times quicker for Terminal Services and much, much faster for streaming media or FTP
- The load balancer must have an Interface in the same subnet as the Real Servers to ensure layer 2 connectivity required for DR mode to work
- The VIP can be brought up on the same subnet as the Real Servers, or on a different subnet provided that the...
load balancer has an interface in that subnet

- Port translation is not possible in DR mode i.e. having a different RIP port than the VIP port
- DR mode is transparent, i.e. the Real Server will see the source IP address of the client

**Layer 7 SNAT Mode**
Layer 7 SNAT mode uses a proxy (HAProxy) at the application layer. Inbound requests are terminated on the load balancer, and HAProxy generates a new request to the chosen Real Server. As a result, Layer 7 is a slower technique than DR or NAT mode at Layer 4. Layer 7 is typically chosen when either enhanced options such as SSL termination, cookie based persistence, URL rewriting, header insertion/deletion etc. are required, or when the network topology prohibits the use of the layer 4 methods.

This mode can be deployed in a one-arm or two-arm configuration and does not require any changes to the Real Servers. However, since the load balancer is acting as a full proxy it doesn't have the same raw throughput as the layer 4 methods.

The load balancer proxies the application traffic to the servers so that the source of all traffic becomes the load balancer.

- SNAT mode is a full proxy and therefore load balanced Real Servers do not need to be changed in any way
- Because SNAT mode is a full proxy any server in the cluster can be on any accessible subnet including across the Internet or WAN
- SNAT mode is not transparent by default, i.e. the Real Servers will not see the source IP address of the client, they will see the load balancers own IP address by default, or any other local appliance IP address if preferred (e.g. the VIP address), this can be configured per layer 7 VIP. If required, the clients IP address can be passed
through either by enabling TProxy on the load balancer, or for HTTP, using X-forwarded-For headers. Please refer to chapter 6 in the administration manual for more details.

- SNAT mode can be deployed using either a 1-arm or 2-arm configuration

**Our Recommendation**

Where possible, we recommend that the combination of Layer 4 Direct Routing (DR) mode and Layer 7 SNAT mode is used. This mode offers the best possible performance for the DR mode services, since replies go directly from the Real Servers to the client and not via the load balancer. It’s also relatively simple to implement. Ultimately, the final choice does depend on your specific requirements and infrastructure.

If DR mode cannot be used, for example if the real servers are located in remote routed networks, then SNAT mode is recommended. SNAT mode is also recommended if it is not possible to make network adaptor changes to the SME servers, for example if you do not own or do not control the infrastructure.

If the load balancer is deployed in AWS, Azure, or GCP, layer 7 SNAT mode must be used as layer 4 direct routing is not currently possible on these platforms.

9. **Configuring File Fabric for Load Balancing**

Ensure that a working, HA File Fabric deployment is in place prior to deploying a load balancer.

Refer to the following Storage Made Easy documentation for guidance on how to achieve this:

- SME 1705 Enterprise File Fabric Appliance Installation Guide
- File Fabric HA Master - Master Database with Automatic Failover
- SME How to configure SFTP

When using the load balancer setup that makes use of layer 4 DR mode, the ARP problem must be solved on each SME server. Please refer to appendix 1 on page 29 for instructions on how to do this.
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)
The WebUI can be accessed via HTTPS at the following URL: https://192.168.2.21:9443/lbadmin
* Note the port number → 9443

(replace 192.168.2.21 with the IP address of your load balancer if it’s been changed from the default)

Login using the following credentials:

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 on the following 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 3 of the appendix on page 36.

Duplicate Service Function

As of version 8.3.8 of the Loadbalancer.org appliance, the Duplicate Service button can be used to save time during initial configuration. This function duplicates the configuration of a given virtual service along with all of the associated back end real servers which have been defined. This is useful for deployments where multiple, very similar virtual services are used, with only minor changes between them. It saves time as the same settings and real servers do not need to be repeatedly defined.

First, fully create the initial virtual service as directed. Then click the Modify button for the virtual service in question, click the Duplicate Service button near the top, and make the necessary changes for the new, duplicated virtual service.

This feature is available for both layer 4 and layer 7 virtual services.

Layer 4 Direct Routing Configuration

Configuring VIP 1 – SME Web Portal

Configuring the Virtual Service (VIP)

1. Using the web user interface, navigate to Cluster Configuration > Layer 4 – Virtual Services and click on Add a new Virtual Service
2. Define the Label for the virtual service as required, e.g. SME_WebPortal
3. Set the Virtual Service IP Address field to the required IP address, e.g. 192.168.86.84
4. Set the Ports field to 80,443
5. Leave the Protocol set to TCP
6. Leave the Forwarding Method set to Direct Routing
7. Click Update to create the virtual service
8. Click Modify next to the newly created VIP
9. Ensure that the Persistence Enable checkbox is checked and that the Timeout is set to 1800
10. Leave the Health Checks Check Type set to Connect to port
11. Click Update

Defining the Real Servers (RIPs)

1. Using the web user interface, navigate to Cluster Configuration > Layer 4 – Real Servers and click on Add a new Real Server next to the newly created VIP
2. Define the Label for the real server as required, e.g. SMEWEB01
3. Set the Real Server IP Address field to the required IP address, e.g. 192.168.86.78
4. Click Update
5. Repeat these steps to add additional SME servers as required
Configuring VIP 2 – SME SFTP

Configuring the Virtual Service (VIP)

1. Using the web user interface, navigate to Cluster Configuration > Layer 4 – Virtual Services and click on Add a new Virtual Service
2. Define the Label for the virtual service as required, e.g. SME_SFTP
3. Set the Virtual Service IP Address field to the required IP address, e.g. 192.168.86.84
4. Set the Ports field to 2200
5. Leave the Protocol set to TCP
6. Leave the Forwarding Method set to Direct Routing
7. Click Update to create the virtual service
8. Click **Modify** next to the newly created VIP
9. Ensure that the **Persistence Enable** checkbox is checked and that the **Timeout** is set to **1800**
10. Leave the **Health Checks Check Type** set to **Connect to port**
11. Click **Update**

### Defining the Real Servers (RIPs)

1. Using the web user interface, navigate to **Cluster Configuration > Layer 4 – Real Servers** and click on **Add a new Real Server** next to the newly created VIP
2. Define the **Label** for the real server as required, e.g. **SMEWEB01**
3. Set the **Real Server IP Address** field to the required IP address, e.g. **192.168.86.78**
4. Click **Update**
5. Repeat these steps to add additional SME servers as required
Layer 7 SNAT Mode Configuration

To load balance the SQL and Memcache services, layer 7 virtual services should be used. This is because layer 4 direct routing mode does not provide any real benefit or advantage for these services.

To set up layer 7 virtual services for SQL and Memcache, follow the appropriate instructions from the next section of this document, *Appliance Configuration for File Fabric – Using Only Layer 7 SNAT Mode*, i.e.:

- Configuring VIP 3 – SME SQL on page 22,
- Configuring VIP 4 – SME Memcache on page 23, and
- Finalizing the Configuration on page 25.
Duplicate Service Function
As of version 8.3.8 of the Loadbalancer.org appliance, the Duplicate Service button can be used to save time during initial configuration. This function duplicates the configuration of a given virtual service along with all of the associated back end real servers which have been defined. This is useful for deployments where multiple, very similar virtual services are used, with only minor changes between them. It saves time as the same settings and real servers do not need to be repeatedly defined.

First, fully create the initial virtual service as directed. Then click the Modify button for the virtual service in question, click the Duplicate Service button near the top, and make the necessary changes for the new, duplicated virtual service. This feature is available for both layer 4 and layer 7 virtual services.

Configuring VIP 1 – SME Web Portal

Configuring The Virtual Service (VIP)
1. Using the web user interface, navigate to Cluster Configuration > Layer 7 – Virtual Services and click on Add a new Virtual Service
2. Define the Label for the virtual service as required, e.g. SME_WebPortal
3. Set the Virtual Service IP Address field to the required IP address, e.g. 192.168.86.84
4. Set the Virtual Service Ports field to 80,443
5. Set the Layer 7 Protocol to TCP Mode
6. Click Update to create the virtual service
7. Click **Modify** next to the newly created VIP
8. Set **Persistence Mode** to **Source IP**
9. Set **Health Checks** to **Connect to port**
10. In the **Other** section click **Advanced** to expand the menu
11. Check the **Timeout** checkbox
12. Set **Client Timeout** to **5m** (this is 5 minutes)
13. Set **Real Server Timeout** to **5m**
14. Click **Update**

---

**Defining The Real Servers (RIPs)**

1. Using the web user interface, navigate to **Cluster Configuration > Layer 7 – Real Servers** and click on **Add a new Real Server** next to the newly created VIP
2. Enter an appropriate name for the server in the **Label** field, e.g. **SMEWEB01**
3. Change the **Real Server IP Address** field to the required IP address, e.g. **192.168.86.78**
4. Click **Update**
5. Repeat these steps to add additional servers as required

![Layer 7 Add a new Real Server - SME_WebPortal](image)

Configuring VIP 2 – SME SFTP

Configuring The Virtual Service (VIP)

1. Using the web user interface, navigate to Cluster Configuration > Layer 7 – Virtual Services and click on Add a new Virtual Service
2. Define the Label for the virtual service as required, e.g. SME_SFTP
3. Set the Virtual Service IP Address field to the required IP address, e.g. 192.168.86.84
4. Set the Virtual Service Ports field to 2200
5. Set the Layer 7 Protocol to TCP Mode
6. Click Update to create the virtual service

![Layer 7 - Add a new Virtual Service](image)
7. Click **Modify** next to the newly created VIP
8. Set **Persistence Mode** to **Source IP**
9. Set **Health Checks** to **Connect to port**
10. In the **Other** section click **Advanced** to expand the menu
11. Check the **Timeout** checkbox
12. Set **Client Timeout** to **5m** (this is 5 minutes)
13. Set **Real Server Timeout** to **5m**
14. Click **Update**

### Defining The Real Servers (RIPs)

1. Using the web user interface, navigate to **Cluster Configuration > Layer 7 – Real Servers** and click on **Add a new Real Server** next to the newly created VIP
2. Enter an appropriate name for the server in the **Label** field, e.g. **SMEWEB01**
3. Change the **Real Server IP Address** field to the required IP address, e.g. **192.168.86.78**
4. Click **Update**
5. Repeat these steps to add additional servers as required
Configuring VIP 3 – SME SQL

Configuring The Virtual Service (VIP)

1. Using the web user interface, navigate to Cluster Configuration > Layer 7 – Virtual Services and click on Add a new Virtual Service
2. Define the Label for the virtual service as required, e.g. SME_SQL_VIP
3. Set the Virtual Service IP Address field to the required IP address, e.g. 192.168.86.81
4. Set the Virtual Service Ports field to 3306
5. Set the Layer 7 Protocol field to TCP Mode
6. Click Update to create the virtual service

7. Click Modify next to the newly created VIP
8. Set Persistence Mode to Source IP
9. Set Health Checks to Connect to port
10. In the Other section click Advanced to expand the menu
11. Check the Timeout checkbox
12. Set Client Timeout to 5m (this is 5 minutes)
13. Set Real Server Timeout to 5m
14. Click Update
Defining The Real Servers (RIPs)
1. Using the web user interface, navigate to Cluster Configuration > Layer 7 – Real Servers and click on Add a new Real Server next to the newly created VIP
2. Enter an appropriate name for the server in the Label field, e.g. SMESQL01
3. Change the Real Server IP Address field to the required IP address, e.g. 192.168.86.82
4. Click Update
5. Repeat these steps to add additional servers as required

Configuring VIP 4 – SME Memcache

Configuring The Virtual Service (VIP)
1. Using the web user interface, navigate to Cluster Configuration > Layer 7 – Virtual Services and click on Add a new Virtual Service
2. Define the Label for the virtual service as required, e.g. SME_MEMCACHE_VIP
3. Set the Virtual Service IP Address field to the required IP address, e.g. 192.168.86.86
4. Set the Virtual Service Ports field to 11211
5. Set the Layer 7 Protocol to TCP Mode
6. Click **Update** to create the virtual service

![Layer 7 - Add a new Virtual Service](image)

7. Click **Modify** next to the newly created VIP
8. Set **Persistence Mode** to **Source IP**
9. Set **Health Checks** to **Connect to port**
10. In the **Other** section click **Advanced** to expand the menu
11. Check the **Timeout** checkbox
12. Set **Client Timeout** to **5m** (this is 5 minutes)
13. Set **Real Server Timeout** to **5m**
14. Click **Update**

![Other](image)

**Defining The Real Servers (RIPs)**

1. Using the web user interface, navigate to **Cluster Configuration > Layer 7 – Real Servers** and click on **Add a new Real Server** next to the newly created VIP
2. Enter an appropriate name for the server in the **Label** field, e.g. **SMESQL01**
3. Change the **Real Server IP Address** field to the required IP address, e.g. **192.168.86.82**
4. Click **Update**

5. Repeat these steps to add additional servers as required

---

**Finalizing the Configuration**

To apply the new settings, HAProxy must be reloaded as follows:

1. Using the WebUI, navigate to: *Maintenance > Restart Services* and click **Reload HAProxy**
13. Testing & Verification

Using System Overview
The System Overview can be viewed in the WebUI. It shows a graphical view of all VIPs & RIPs (i.e. the SME servers) and shows the state/health of each server as well as the state of the cluster as a whole. The example below shows that both SME servers are healthy, across all 5 virtual services, and available to accept connections:

Layer 4 Direct Routing Specific Check
If using the setup that combines layer 4 DR mode and layer 7 SNAT mode, it is possible to specifically check that layer 4 DR mode has been correctly configured (including verifying that the real servers have been modified correctly in
regards to the AR

After sending traffic to the layer 4 DR mode virtual services, check that connections are not in the SYN_RECV state and that they are ESTABLISHED. This can be done through the load balancer’s WebUI, by navigating to Reports > Layer 4 Current Connections.

If there are a significant number of connections in the SYN_RECV state then that implies that the ARP problem has not been correctly resolved on the back end real servers.

SFTP Service Check
For details on how to perform a check of the SFTP service, see section 2 of the appendix on page 34.

14. Technical Support
For more details about configuring the appliance and assistance with designing your deployment please don’t hesitate to contact the support team using the following email address: support@loadbalancer.org.

15. Further Documentation
16. Conclusion
Loadbalancer.org appliances provide a very cost effective solution for highly available load balanced Storage Made Easy File Fabric environments.
17. Appendix

1 - Solving the ARP Problem

When using Layer 4 DR mode, the ARP problem must be solved. This involves configuring each Real Server to be able to receive traffic destined for the VIP, and ensuring that each Real Server does not respond to ARP requests for the VIP address – only the load balancer should do this.

The steps below are for Windows 2012/2016, for other versions of Windows please refer to chapter 6 in the administration manual.

Step 1: Install the Microsoft Loopback Adapter

1. Click Start, then run hdwwiz to start the Hardware Installation Wizard
2. When the Wizard has started, click Next
3. Select Install the hardware that I manually select from a list (Advanced), click Next
4. Select Network adapters, click Next
5. Select Microsoft & Microsoft KM-Test Loopback Adapter, click Next

![Add Hardware Screen](image)

6. Click Next to start the installation, when complete click Finish
Step 2: Configure the Loopback Adapter

1. Open Control Panel and click Network and Sharing Center
2. Click Change adapter settings
3. Right-click the new Loopback Adapter and select Properties
4. Un-check all items except Internet Protocol Version 4 (TCP/IPv4) and Internet Protocol Version 6 (TCP/IPv6) as shown below:

![Loopback Properties](image)

Note: Leaving both checked ensures that both IPv4 and IPv6 are supported. Select one if preferred.

Important: When configuring the Loopback Adapter to solve the ARP Problem, the following options must also be checked (ticked):
- Client for Microsoft Networks
- File & Printer Sharing for Microsoft Networks

5. If configuring IPv4 addresses select Internet Protocol Version (TCP/IPv4), click Properties and configure the IP address to be the same as the Virtual Service (VIP) with a subnet mask of 255.255.255.255, e.g. 192.168.2.20/255.255.255.255 as shown below:
6. If configuring IPv6 addresses select Internet Protocol Version (TCP/IPv6), click Properties and configure the IP address to be the same as the Virtual Service (VIP) and set the Subnet Prefix Length to be the same as your network setting, e.g. 2001:470:1f09:e72::15/64 as shown below:

7. Click OK on TCP/IP Properties, then click Close on Ethernet Properties to save and apply the new settings.

8. Now repeat the above process on the other Windows 2012/2016 Real Servers.
Step 3: Configure the strong/weak host behavior

Windows Server 2000 and Windows Server 2003 use the weak host model for sending and receiving for all IPv4 interfaces and the strong host model for sending and receiving for all IPv6 interfaces. You cannot configure this behavior. The Next Generation TCP/IP stack in Windows 2008 and later supports strong host sends and receives for both IPv4 and IPv6 by default. To ensure that Windows 2012/2016 is running in the correct mode to be able to respond to the VIP, the following commands must be run on each Real Server:

For IPv4 addresses:

```plaintext
netsh interface ipv4 set interface "net" weakhostreceive=enabled
netsh interface ipv4 set interface "loopback" weakhostreceive=enabled
netsh interface ipv4 set interface "loopback" weakhostsend=enabled
```

For these commands to work, the LAN connection NIC must be named “net” and the loopback NIC must be named “loopback” as shown below. If you prefer to leave your current NIC names, then the commands above must be modified accordingly. For example, if your network adapters are named “LAN” and “LOOPBACK”, the commands required would be:

```plaintext
netsh interface ipv4 set interface "LAN" weakhostreceive=enabled
netsh interface ipv4 set interface "LOOPBACK" weakhostreceive=enabled
netsh interface ipv4 set interface "LOOPBACK" weakhostsend=enabled
```

For IPv6 addresses:

```plaintext
netsh interface ipv6 set interface "net" weakhostreceive=enabled
netsh interface ipv6 set interface "loopback" weakhostreceive=enabled
netsh interface ipv6 set interface "loopback" weakhostsend=enabled
netsh interface ipv6 set interface "loopback" dadtransmits=0
```

For these commands to work, the LAN connection NIC must be named “net” and the loopback NIC must be named “loopback” as shown below. If you prefer to leave your current NIC names, then the commands above must be modified accordingly. For example, if your network adapters are named “LAN” and “LOOPBACK”, the commands required would be:

```plaintext
netsh interface ipv6 set interface "LAN" weakhostreceive=enabled
netsh interface ipv6 set interface "LOOPBACK" weakhostreceive=enabled
netsh interface ipv6 set interface "LOOPBACK" weakhostsend=enabled
netsh interface ipv6 set interface "LOOPBACK" dadtransmits=0
```
Note: The names for the NICs are case sensitive, so make sure that the name used for the interface and the name used in the commands match exactly.

1. Start Powershell or use a command window to run the appropriate netsh commands as shown in the example below:

Note: This shows an IPv6 example, use the IPv4 commands if you're using IPv4 addresses.

2. Now repeat these 4 commands on the other Windows 2012/2016 Real Servers

Note: Solving the ARP problem for other version of Windows is similar. For full details, please refer to the administration manual.
2 – Testing the SFTP Service

When using SFTP, it should be possible to access the SFTP virtual service using pre-configured SME web portal credentials.

It should be possible to access the SFTP service via the VIP address, by using an SFTP client and appropriate credentials:

The test connection should appear on the System Overview page:
<table>
<thead>
<tr>
<th>REAL SERVER</th>
<th>IP</th>
<th>PORTS</th>
<th>WEIGHT</th>
<th>CONNS</th>
<th>Layer 7</th>
<th>Proxy</th>
</tr>
</thead>
<tbody>
<tr>
<td>SME_WEB01</td>
<td>192.168.86.78</td>
<td>2200</td>
<td>100</td>
<td>1</td>
<td>Drain</td>
<td>Halt</td>
</tr>
<tr>
<td>SME_WEB02</td>
<td>192.168.86.79</td>
<td>2200</td>
<td>100</td>
<td>0</td>
<td>Drain</td>
<td>Halt</td>
</tr>
</tbody>
</table>
3 – 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:

![Create a Clustered Pair](image)

• Once complete, the following will be displayed:

![High Availability Configuration - Master](image)

• 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.
# 18. 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>1.0.0</td>
<td>17 December 2019</td>
<td>Initial version</td>
<td></td>
<td>IBG, AH</td>
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<tr>
<td>1.0.1</td>
<td>3 September 2020</td>
<td>New title page</td>
<td>Branding update</td>
<td>AH</td>
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<td></td>
<td>Updated Canadian contact</td>
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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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