



Load Balancing Microsoft Print Server

v1.1.2

Quick Reference Guide

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About this Guide

This document provides a quick reference guide on how to load balance Microsoft Print Servers 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

Port	Use	Transport Layer Protocol
135,137,138,139 *	NetBIOS & RPC	TCP
445	SMB	TCP
1024-65535 *	Dynamically assigned RPC ports	TCP

(*) Not required for Windows 2000 and later

Load Balancer Configuration

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.

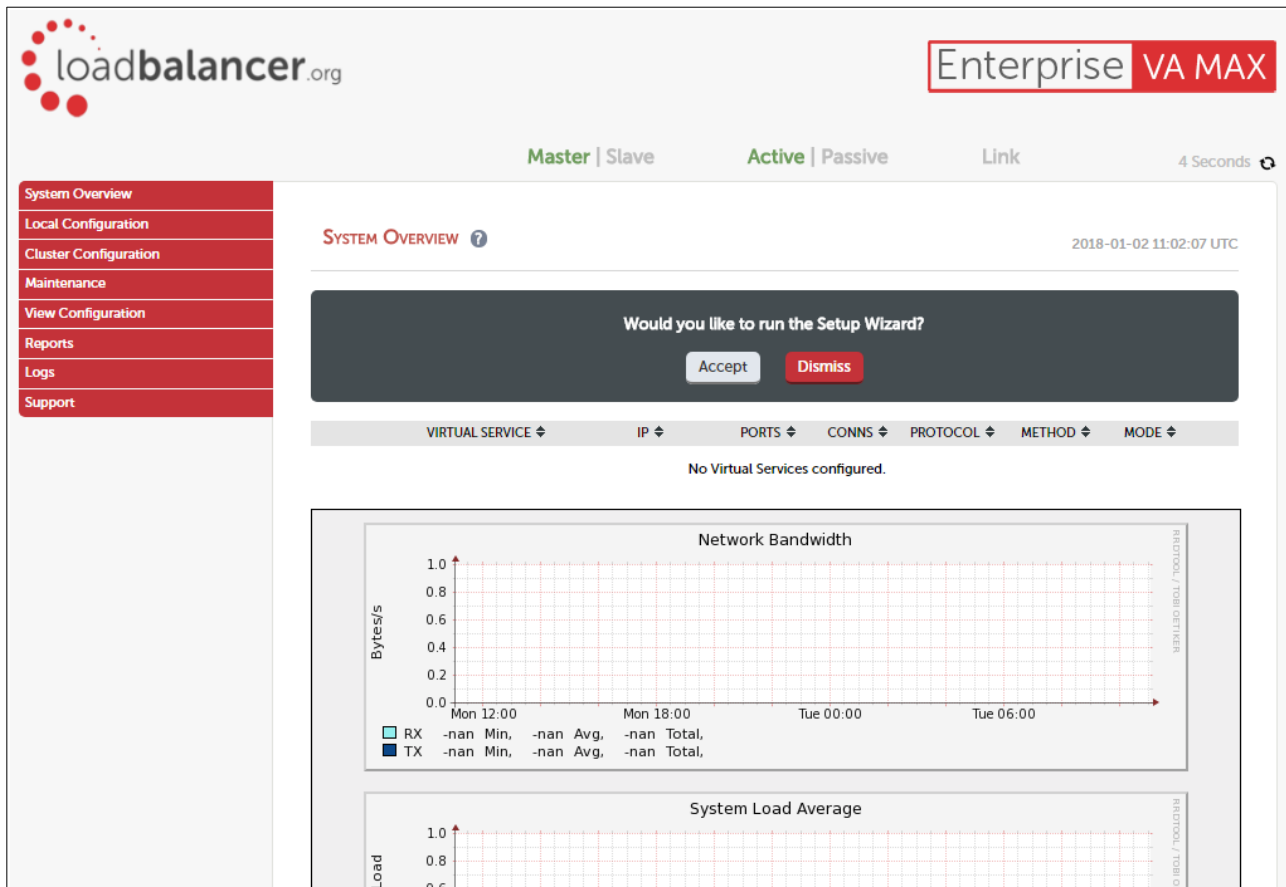
Use the following default credentials to login:

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:



Configure The Virtual Service (VIP)

Create a new Virtual Service as described below.

1. Using the WebUI, navigate to: *Cluster Configuration > Layer 4 – Virtual Services* and click **Add a New Virtual Service**
2. Configure the VIP - the ports required depend on your environment:
 - If your environment is based on Windows 2000 and later, by default it will use DNS name resolution & file & print sharing using direct hosted SMB over TCP/IP
 - If your environment is based on versions of Windows prior to Windows 2000, by default it will use NetBIOS name resolution & file & print sharing using SMB and NBT (NetBIOS over TCP/IP)

For Windows 2000 and later, enter the following details:

Label	<input type="text" value="PrintServerVIP"/>	?	
Virtual Service	IP Address	<input type="text" value="192.168.100.10"/>	?
	Ports	<input type="text" value="445"/>	?
Protocol	<input type="text" value="TCP"/>	?	
Forwarding Method	<input type="text" value="Direct Routing"/>	?	
		<input type="button" value="Cancel"/> <input type="button" value="Update"/>	

1. Define the required *Label* (name) for the VIP, e.g. **PrintServerVIP**
2. Set the *Virtual Service IP address* field to the required IP address, e.g. **192.168.100.10**
3. Set the *Virtual Service Ports* field to **445**
4. Click **Update**
5. Now click **Modify** next to the newly created Virtual Service
6. Ensure the *Check Port* is set to **445**
7. Click **Update**

For legacy environments prior to Windows 2000, enter the following details:

Label	<input type="text" value="PrintServerVIP"/>	?	
Virtual Service	IP Address	<input type="text" value="192.168.100.10"/>	?
	Ports	<input type="text" value="135,137,138,139,445,1024-6"/>	?
Protocol	<input type="text" value="TCP"/>	?	
Forwarding Method	<input type="text" value="Direct Routing"/>	?	
		<input type="button" value="Cancel"/> <input type="button" value="Update"/>	

1. Define the required *Label* (name) for the VIP, e.g. **PrintServerVIP**
2. Set the *Virtual Service IP address* field to the required IP address, e.g. **192.168.100.10**
3. Set the *Virtual Service Ports* field to **135,137,138,139,445,1024-65535**
4. Click **Update**
5. Now click **Modify** next to the newly created Virtual Service
6. Ensure the *Check Port* is set to **135**
7. Click **Update**

Define The Real (Print Server) Servers

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:

Label	<input type="text" value="PS1"/>	?
Real Server IP Address	<input type="text" value="192.168.100.20"/>	?
Weight	<input type="text" value="100"/>	?
Minimum Connections	<input type="text" value="0"/>	?
Maximum Connections	<input type="text" value="0"/>	?

3. Enter an appropriate label for the Real Server, e.g. **PS1**
4. Change the *Real Server IP Address* field to the required address, e.g. **192.168.100.20**
5. Click **Update**
6. Repeat the above steps to add your other Print Server(s)

Print Server Configuration

Step 1 - Initial Configuration

Complete the following steps on each print server:

1. Join the server to the same domain as the client PCs
2. Install the **Print and Document Service** role / **Print Server** service
3. Install & share the printers (use the same share names and permissions across all servers)
4. Solve the "ARP Problem" - this involves installing and configuring a Loopback Adapter and configuring the Windows networking stack to use the weak host model. For full details of the configuration steps required, please refer to the [Administration Manual](#) and search for "Solving the ARP Problem for Windows Servers" and follow the steps for your version of Windows.

Note: You can easily check the host model settings before / after configuration using the command:

```
netsh interface ipv4 show interface <interface name>
```

e.g.

```
netsh interface ipv4 show interface loopback
```

IMPORTANT NOTE: When configuring the loopback adapter, make sure that these options are also checked (ticked): '**Client for Microsoft Networks**' and '**File & Printer Sharing for Microsoft Networks**'

Step 2 – Enable Print Server Load Balancing

To enable the print servers to be accessed via a shared name (**printserver-vip** in this guide), the following steps must be completed:

Windows 2019

Host entries must be added to the local hosts file on each Print Server. For example, if you have 2 Print Servers: 192.168.100.20 and 192.168.100.21, add the following entries to the hosts files:

On the 192.168.100.20 server

```
192.168.100.20 printserver-vip
192.168.100.20 printserver-vip.domain.com
```

On the 192.168.100.21 server

```
192.168.100.21 printserver-vip
192.168.100.21 printserver-vip.domain.com
```

where **printserver-vip** is the DNS name clients use to access the load balanced Print Servers.

Windows 2012 & 2016

Configure the following Registry entries:

Ref.	Registry Key Requirements
1	Key: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Lsa Value: DisableLoopbackCheck Type: REG_DWORD Data: 1
2	Key: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\lanmanserver\parameters Value: DisableStrictNameChecking Type: REG_DWORD Data: 1
3	Key: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\lanmanserver\parameters Value: OptionalNames

	<p>Type: REG_MULTI_SZ Data: printserver-vip</p> <div style="background-color: #f0f0f0; padding: 10px; margin: 10px 0;"> <p>Note: 'PrintServer-vip' is the name that will be used to access the load balanced print servers via the Virtual Service (VIP) created on the load balancer. This can be set to be any appropriate name. Whatever name is used, it must be the same name that is used for the DNS or NetBIOS entry described in the <i>Configure Name Resolution</i> section below.</p> </div>
4	<p>If your print servers are running Windows 2008 R2 and you want to refer to your printer by the FQDN, e.g. printserver-vip.lbtestdom.com, you'll also need to add the following registry key to each print server.</p> <p>Key: HKLM\SYSTEM\CurrentControlSet\Control\Print Value: DnsOnWire Type: REG_QWORD Data: 1</p>

Step 3 – Configure Name Resolution

Configure either DNS or NetBIOS name resolution as detailed below:

DNS Name Resolution (Windows 2000 & later)

To configure DNS name resolution complete the following steps:

1. Disable NetBIOS over TCP/IP on all interfaces of each print server
2. Create a DNS record for the share name, in this example: **printserver-vip ---> 192.168.110.10**

NetBIOS Name Resolution (legacy Environments)

To configure NetBIOS name resolution complete the following steps:

1. On each print server, disable NetBIOS over TCP/IP on the main NIC, leave it enabled on the Loopback adapter
2. Either setup a WINS server and configure all clients to use this or setup pre-loaded entries in the LMHosts file of each client

Note: As shown in the flow chart in [this Technet article](#), for a default H-node client, NetBIOS name resolution occurs on the following order:

1. Local NetBIOS cache
2. WINS server
3. NetBIOS broadcast
4. Local LMHosts file

Therefore, to avoid broadcast, LMHost entries must be declared as pre-loaded to ensure they are available in the local NetBIOS cache.

3. To configure the LMHosts file, create an entry as shown below:

```
printserver-vip 192.168.100.10 #PRE
```

Entries with the #PRE directive are loaded into the cache on reboot or can be forced using the following command:

```
nbtstat -R
```

Use the following command to view the cache and verify the entry has been added:

```
nbtstat -c
```

Step 4 – Server Reboot

To apply all the changes, reboot each print server.

Testing & Verification

You should now be able to access your printers by browsing using either the Virtual Service IP address, or the share name. In this example:

```
\\192.168.100.10
```

or

```
\\printserver-vip
```

or

```
\\printserver-vip.domain.com
```

Deploying Printers via Group Policy

- Ensure that the load balanced print server name (e.g. **printserver-vip**) is resolvable by DNS or NetBIOS as explained above
- On your print server, open: *Administrative Tools > Printer Management*

-
- Right-click Print Servers and enter the name for your load balanced print server (e.g. **printserver-vip**) and click OK
 - Expand the *Printers* section
 - Right click the printer you want to deploy, and click *Deploy with Group Policy*
 - Select the relevant GPO and configure the remaining settings according to your requirements

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

Version	Date	Change	Reason for Change	Changed By
1.1.0	4 November 2019	Styling and layout	General styling updates	AH
1.1.1	9 June 2020	New title page Updated Canadian contact details	Branding update Change to Canadian contact details	AH
1.1.2	25 June 2021	Added print server load balancing configuration steps for Windows 2019	The steps listed for other versions of Windows do not work for Windows 2019	RJC

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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