Load Balancing Microsoft Print Server
v1.1.2

Quick Reference Guide
Contents

About this Guide..........................................................................................................................................................................................3
Related Documentation......................................................................................................................................................................................3
Load Balanced Ports..................................................................................................................................................................................3
Load Balancer Configuration.......................................................................................................................................................................3
  Deploy the Loadbalancer.org Appliance.....................................................................................................................................................3
  Accessing The Appliance WebUI..............................................................................................................................................................3
  Configure the Virtual Service (VIP)............................................................................................................................................................4
  Define the Real (Print Server) Servers...................................................................................................................................................6
Print Server Configuration.............................................................................................................................................................................6
  Step 1 - Initial Configuration....................................................................................................................................................................6
  Step 2 – Enable Print Server Load Balancing.........................................................................................................................................7
  Step 3 – Configure Name Resolution.....................................................................................................................................................8
  Step 4 – Server Reboot..........................................................................................................................................................................9
Testing & Verification...................................................................................................................................................................................9
Deploying Printers via Group Policy..........................................................................................................................................................9
Loadbalancer.org Technical Support...........................................................................................................................................................10
Document Revision History..........................................................................................................................................................................11

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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

<table>
<thead>
<tr>
<th>Port</th>
<th>Use</th>
<th>Transport Layer Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>135,137,138,139 *</td>
<td>NetBIOS &amp; RPC</td>
<td>TCP</td>
</tr>
<tr>
<td>445</td>
<td>SMB</td>
<td>TCP</td>
</tr>
<tr>
<td>1024-65535 *</td>
<td>Dynamically assigned RPC ports</td>
<td>TCP</td>
</tr>
</tbody>
</table>

(*) 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:

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:

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:

   ![Real Server Configuration Form]

   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:

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Registry Key Requirements</th>
</tr>
</thead>
</table>
| 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 |
### 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](https://technet.microsoft.com), 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

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