



DNS

Deployment Guide

UPDATED: 27 July 2023

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1 Introduction

Domain name system (DNS) servers match domain names like Kemptechnologies.com to their associated IP addresses, for example, 107.22.236.183. When you type kemptechnologies.com into your web browser's address bar, your computer contacts your current DNS server and asks what IP address is associated with kemptechnologies.com.

The Kemp LoadMaster is used to load balance the DNS workload. The LoadMaster offers advanced Layer 4 and Layer 7 server load balancing, SSL Acceleration and a multitude of other advanced Application Delivery Controller (ADC) features. The LoadMaster intelligently and efficiently distributes user traffic among the application servers so that users get the best experience possible.

1.1 Document Purpose

This document provides the recommended LoadMaster settings used when load balancing the DNS workload. The Kemp Support Team is available to provide solutions for scenarios not explicitly defined. The Kemp support site can be found at: <https://support.kemptechnologies.com>

1.2 Intended Audience

This document is intended to be read by anyone who is interested in configuring the LoadMaster to optimize the DNS server.

1.3 Template

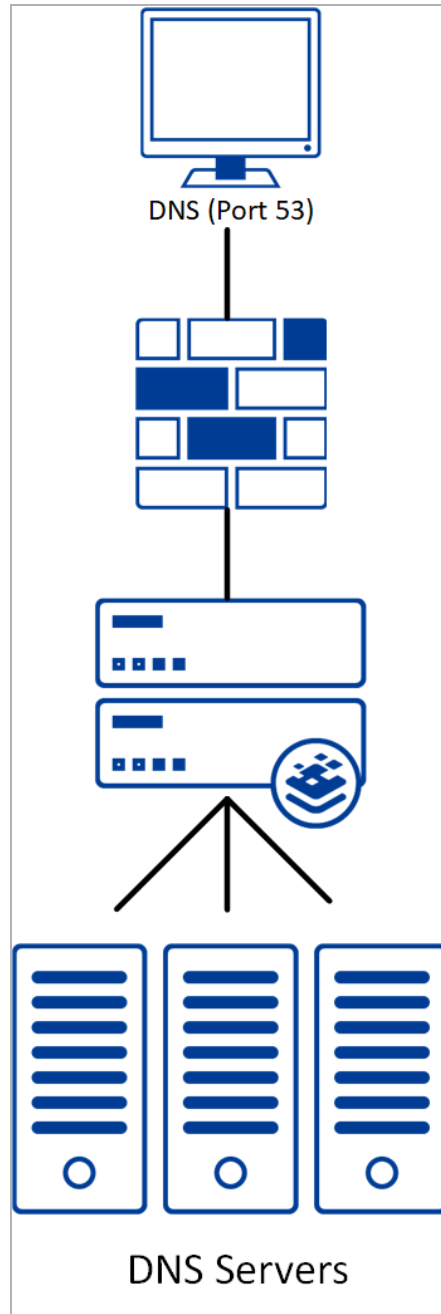
Kemp has developed a template containing our recommended settings for this workload. You can install this template to help create Virtual Services (VSs) because it automatically populates the settings. You can use the template to easily create the required VSs with the recommended settings. For some workloads, additional manual steps may be required such as assigning a certificate or applying port following, these steps are covered in the document, if needed.

You can remove templates after use and this will not affect deployed services. If needed, you can make changes to any of the VS settings after using the template.

Download released templates from the following page: [LoadMaster Templates](#).

For more information and steps on how to import and use templates, refer to the [Virtual Services and Templates, Feature Description](#) on the Kemp Documentation page.

2 Architecture



3 Configure the LoadMaster

The deployed DNS environment determines which of the following setups is used.

3.1 Enable Subnet Originating Requests Globally

It is best practice to enable the **Subnet Originating Requests** option globally.

In a one-armed setup (where the Virtual Service and Real Servers are on the same network/subnet) **Subnet Originating Requests** is usually not needed. However, enabling **Subnet Originating Requests** should not affect the routing in a one-armed setup.

In a two-armed setup where the Virtual Service is on network/subnet A, for example, and the Real Servers are on network B, **Subnet Originating Requests** should be enabled on LoadMasters with firmware version 7.1-16 and above.

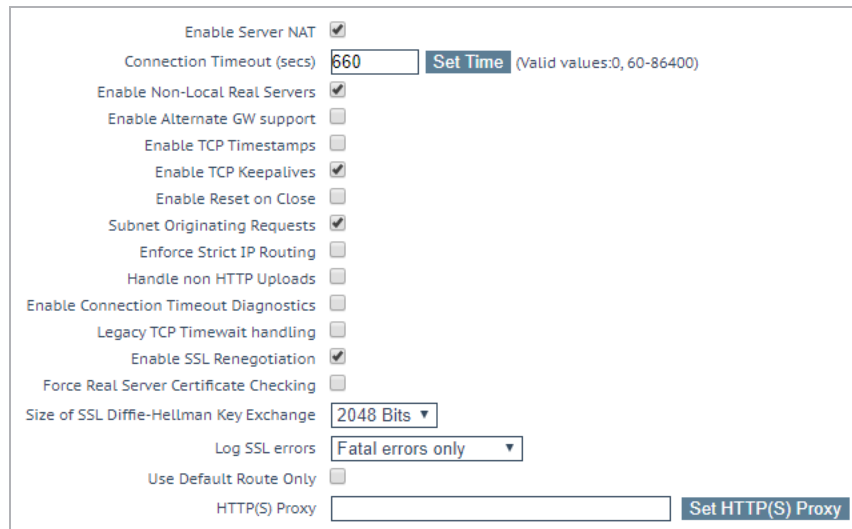
When **Subnet Originating Requests** is enabled, the LoadMaster routes traffic so that the Real Server sees traffic arriving from the LoadMaster interface that is in that network/subnet.

When **Subnet Originating Requests** is enabled globally, it is automatically enabled on all Virtual Services. If the **Subnet Originating Requests** option is disabled globally, you can choose whether to enable **Subnet Originating Requests** on a per-Virtual Service basis.

To enable **Subnet Originating Requests** globally, follow the steps below:

1. In the main menu of the LoadMaster Web User Interface (WUI), go to **System Configuration > Miscellaneous Options > Network Options**.

3 Configure the LoadMaster



The screenshot shows a configuration window with the following settings:

- Enable Server NAT: ☒
- Connection Timeout (secs): 660 (Valid values: 0, 60-86400) [Set Time]
- Enable Non-Local Real Servers: ☒
- Enable Alternate GW support: ☐
- Enable TCP Timestamps: ☐
- Enable TCP Keepalives: ☒
- Enable Reset on Close: ☐
- Subnet Originating Requests: ☒
- Enforce Strict IP Routing: ☐
- Handle non HTTP Uploads: ☐
- Enable Connection Timeout Diagnostics: ☐
- Legacy TCP Timewait handling: ☐
- Enable SSL Renegotiation: ☒
- Force Real Server Certificate Checking: ☐
- Size of SSL Diffie-Hellman Key Exchange: 2048 Bits
- Log SSL errors: Fatal errors only
- Use Default Route Only: ☐
- HTTP(S) Proxy: [Set HTTP(S) Proxy]

2. Select the **Subnet Originating Requests** check box.

3.2 Enable Check Persist Globally

It is recommended that you change the **Always Check Persist** option to **Yes – Accept Changes**. Use the following steps:

1. Go to **System Configuration > Miscellaneous Options > L7 Configuration**.

3 Configure the LoadMaster

Allow connection scaling over 64K Connections	<input type="checkbox"/>
Always Check Persist	Yes - Accept Changes ▼
Add Port to Active Cookie	<input type="checkbox"/>
Conform to RFC	<input checked="" type="checkbox"/>
Close on Error	<input type="checkbox"/>
Add Via Header In Cache Responses	<input type="checkbox"/>
Real Servers are Local	<input type="checkbox"/>
Drop Connections on RS failure	<input checked="" type="checkbox"/>
Drop at Drain Time End	<input checked="" type="checkbox"/>
L7 Connection Drain Time (secs)	300 Set Time (Valid values:0, 60 - 86400)
L7 Authentication Timeout (secs)	30 Set Timeout (Valid values:30 - 300)
L7 Client Token Timeout (secs)	120 Set Timeout (Valid values:60 - 300)
Additional L7 Header	X-Forwarded-For ▼
100-Continue Handling	RFC-7231 Compliant ▼
Allow Empty POSTs	<input type="checkbox"/>
Allow Empty HTTP Headers	<input type="checkbox"/>
Force Complete RS Match	<input type="checkbox"/>
Least Connection Slow Start	0 Set Slow Start (Valid values:0 - 600)
Share SubVS Persistence	<input type="checkbox"/>
Log Insight Message Split Interval	10 Set Log Split Interval (Valid values:1 - 100)
Include User Agent Header in User Logs	<input type="checkbox"/>
Use CEF Log Format	<input type="checkbox"/>

2. Click the **Always Check Persist** drop-down arrow and select **Yes – Accept Changes**.

3.3 Create the DNS Virtual Services

The following sections describe the recommended settings for the DNS Virtual Services.

3.3.1 Create the DNS Virtual Services Using the Template

The following are the steps involved and the recommended settings to configure the DNS Virtual Service:

1. In the main menu of the LoadMaster Web User Interface (WUI), go to **Virtual Services > Add New**.

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Please Specify the Parameters for the Virtual Service.

Virtual Address	<input type="text" value="10.154.11.144"/>
Port	<input type="text" value="53"/>
Service Name (Optional)	<input type="text" value="DNS"/>
Use Template	<input type="text" value="DNS"/>
Protocol	<input type="text" value="tcp"/>

2. Type a valid **Virtual Address**.
3. Select the **DNS** template from the **Use Template** drop-down list.
4. Click **Add this Virtual Service**.

If adding a DNS Virtual Service on a network not associated with the interface containing the LoadMaster's global default gateway, a Virtual Service Default Gateway is required. It is not possible to set a default gateway on a UDP Virtual Service. To set the default gateway for a UDP Virtual Service, use this workaround:

1. Create a TCP Virtual Service with the same IP address (the port is irrelevant). Do not add any Real Servers.
2. Set the **Default Gateway** for that Virtual Service. It will also affect the UDP Virtual Service (that is, the required one).

Default gateways only work on IP addresses, so having two Virtual Services with the same IP address and different default gateways does not work.

3.3.2 Configure the DNS TCP Virtual Service

The following are the steps involved and recommended settings to configure the DNS TCP Virtual Service:

1. Select **View/Modify Services** under **Virtual Services** in the main menu on the left.

Add New							
Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.12:53	tcp	DNS TCP	L7		⊗ Down		<input type="button" value="Modify"/> <input type="button" value="Delete"/>
10.10.99.12:53	udp	DNS UDP	L7		⊗ Down		<input type="button" value="Modify"/> <input type="button" value="Delete"/>

2. Click **Modify** on the **DNS TCP** Virtual Service.

3 Configure the LoadMaster

3. Add the Real Servers:

- a) Expand the **Real Servers** section.
- b) Click **Add New**.
- c) Enter the address of the relevant Real Server.
- d) Confirm that port **53** is entered.
- e) Click **Add this Real Server**, then click **OK** to the pop-up message.
- f) Repeat the steps above to add more Real Servers as needed, based on your environment.

3.3.2.1 DNS TCP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. You can use these settings with scripts and automation tools.

API Parameters	API Value
port	53
prot	tcp
VStype	gen
SubnetOriginating	1
Idletimeout	180
Schedule	lc
CheckType	tcp

3.3.3 Configure the DNS UDP Virtual Service

The following are the steps involved and the recommended settings to configure the DNS UDP Virtual Service:

1. Select **View/Modify Services** under **Virtual Services** in the main menu on the left.

Add New							
Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.12:53	tcp	DNS TCP	L7		⊗ Down		Modify Delete
10.10.99.12:53	udp	DNS UDP	L7		⊗ Down		Modify Delete

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2. Click **Modify** on the **DNS UDP** Virtual Service.
3. Add the Real Servers:
 - a) Expand the **Real Servers** section.
 - b) Click **Add New**.
 - c) Enter the address of the relevant Real Server.
 - d) Confirm that port **53** is entered.
 - e) Click **Add this Real Server**, then click **OK** to the pop-up message.
 - f) Confirm that port **53** is entered.
 - g) Click **Add this Real Server**, then click **OK** to the pop-up message.
 - h) Repeat the steps above to add more Real Servers as needed, based on your environment.

3.3.3.1 DNS UDP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. You can use these settings with scripts and automation tools.

API Parameters	API Value
port	53
prot	udp
VStype	gen
SubnetOriginating	1
Schedule	lc
CheckType	dns

References

Unless otherwise specified, the following documents can be found at <http://kemptechnologies.com/documentation>.

Virtual Services and Templates, Feature Description

Last Updated Date

This document was last updated on 27 July 2023.