



Apache Tomcat

Deployment Guide

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1 Introduction

Apache Tomcat, often referred to as Tomcat, is an open-source Java Servlet Container developed by the Apache Software Foundation. Tomcat implements several Java EE specifications including Java Servlet, JavaServer Pages, Java EL, and WebSocket, and provides a 'pure Java' HTTP web server environment in which Java code can run.

The Kemp LoadMaster is used to load balance the Apache Tomcat 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 Apache Tomcat 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 Apache Tomcat server.

2 Apache Tomcat Template

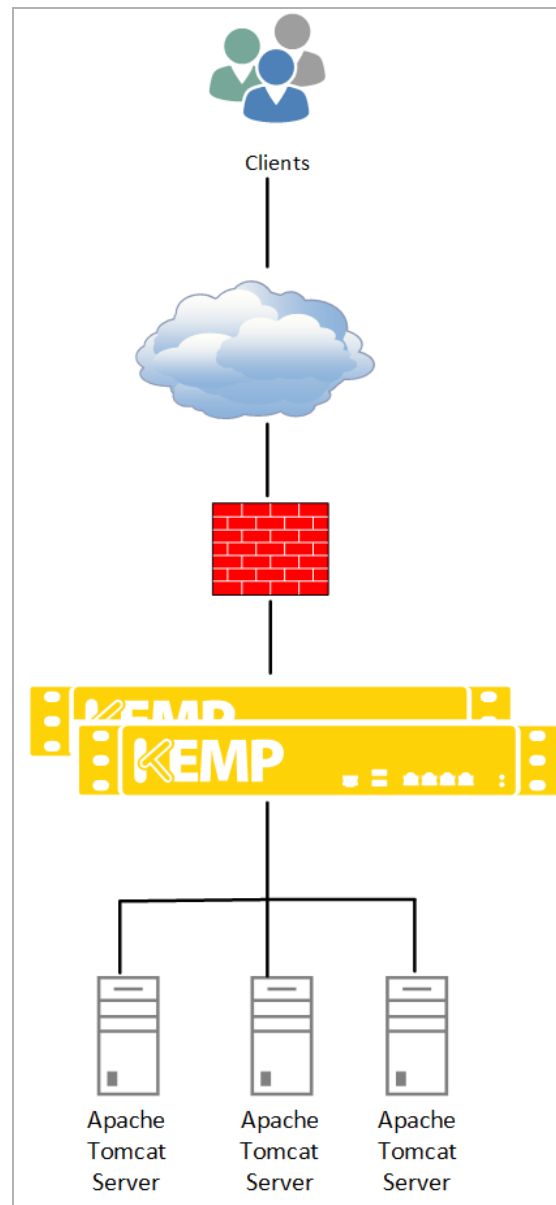
Kemp has developed a template containing our recommended settings for Apache Tomcat. You can install this template on the LoadMaster and use it when creating Virtual Services. Using a template automatically populates the settings in the Virtual Services, which is quicker and easier than manually configuring each Virtual Service. If needed, you can make changes to any of the Virtual Service 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](#).

For steps on how to manually add and configure each of the Virtual Services, refer to the other sections of this document.

3 Architecture



4 Configure the LoadMaster

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

4.1 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**.

4 Configure the LoadMaster

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

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

4.2 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**.

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**.

4.3 Create the Apache Tomcat Virtual Services

The following sections describe the recommended settings for the Apache Tomcat Virtual Services.

4.3.1 Create an Apache Tomcat HTTP Virtual Service

The following are the steps involved and the recommended settings to configure the Apache Tomcat HTTP Virtual Service:

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

Please Specify the Parameters for the Virtual Service.

Virtual Address

Port

Service Name (Optional)

Use Template

Select a Template

▼

Protocol

tcp

▼

Cancel

Add this Virtual Service

2. Type a valid **Virtual Address**.
3. Type **80** as the **Port**.
4. Enter a recognizable **Service Name**, such as Apache Tomcat HTTP Virtual Service.
5. Click **Add this Virtual Service**.
6. Configure the settings as recommended in the following table:

Section	Option	Value
Standard Options	Persistence Mode	Active Cookie
	Timeout	1 Hour
	Cookie name	JSESSIONID
	Scheduling Method	least connection
	Idle Connection Timeout	900

7. Add the Real Servers:
 - a) Expand the **Real Servers** section.
 - b) Click **Add New**.
 - c) Enter the address of the relevant Real Server.
 - d) Complete the other fields as required.
 - 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.

4.3.2 Create an Apache Tomcat HTTPS Virtual Service

The following are the steps involved and the recommended settings to configure the Apache Tomcat HTTPS Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > Add New**.

Please Specify the Parameters for the Virtual Service.

Virtual Address

Port

Service Name (Optional)

Use Template

Select a Template

Protocol

tcp

Cancel

Add this Virtual Service

2. Type a valid **Virtual Address**.
3. Type **443** as the **Port**.
4. Enter a recognizable **Service Name**, such as Apache Tomcat HTTPS Virtual Service.
5. Click **Add this Virtual Service**.
6. Configure the settings as recommended in the following table:

Section	Option	Value	Comment
Standard Options	Persistence Mode	Source IP Address	
	Timeout	1 Hour	
	Scheduling Method	least connection	
	Idle Connection Timeout	900	

Section	Option	Value	Comment
Advanced Properties	Add a Port 80 Redirector VS	https://%h%s	Click Add HTTP Redirector . This automatically creates a redirect on port 80.

7. Add the Real Servers:

- Expand the **Real Servers** section.
- Click **Add New**.
- Enter the address of the relevant Real Server.
- Complete the other fields as required.
- Click **Add this Real Server** then click **OK** to the pop-up message.
- Repeat the steps above to add more Real Servers as needed, based on your environment.

Create an Apache Tomcat HTTPS Redirect Virtual Service

Clicking the **Add HTTP Redirector** button automatically creates a port 80 redirect Virtual Service. This is optional, but the purpose of this Virtual Service is to redirect any clients who have connected using HTTP to the HTTPS Virtual Service. Kemp also recommends changing the **Real Server Check Method** and **Persistence Mode** to **None**.

4.3.3 Create an Apache Tomcat HTTPS Offloaded Virtual Service

The following are the steps involved and the recommended settings to configure the Apache Tomcat HTTPS Offloaded Virtual Service:

- In the main menu of the LoadMaster WUI, go to **Virtual Services > Add New**.

Please Specify the Parameters for the Virtual Service.

Virtual Address

10.154.11.144

Port

443

Service Name (Optional)

Apache Tomcat HTT

Use Template

Select a Template

Protocol

tcp

Cancel

Add this Virtual Service

- 2. Type a valid **Virtual Address**.
- 3. Type **443** as the **Port**.
- 4. Enter a recognizable Service Name, such as **Apache Tomcat HTTPS Offloaded** Virtual Service.
- 5. Click Add this Virtual Service.
- 6. Configure the settings as recommended in the following table:

Section	Option	Value	Comments
Standard Options	Persistence Mode	Active Cookie	
	Timeout	1 Hour	
	Cookie name	JSESSIONID	
	Scheduling Method	least connection	
	Idle Connection Timeout	900	
SSL Properties	SSL Acceleration	Enabled	
	Cipher Set	BestPractices	
Advanced Properties	Add a Port 80 Redirector VS	https://%h%s	Click Add HTTP Redirector . This automatically creates a redirect on port 80.

7. Add the Real Servers:

- a) Expand the **Real Servers** section.
- b) Click **Add New**.
- c) Enter the address of the relevant Real Server.
- d) Complete the other fields as required.
- 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.

Create an Apache Tomcat HTTPS Offloaded HTTP Redirect Virtual Service

Clicking the **Add HTTP Redirector** button automatically creates a port 80 redirect Virtual Service. This is optional, but the purpose of this Virtual Service is to redirect any clients who have connected using HTTP to the HTTPS Virtual Service. Kemp also recommends changing the **Real Server Check Method** and **Persistence Mode** to **None**.

4.3.4 Create an Apache Tomcat HTTPS Re-encrypt Virtual Service

The following are the steps involved and the recommended settings to configure the Apache Tomcat HTTPS Re-encrypt Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > Add New**.

Please Specify the Parameters for the Virtual Service.

Virtual Address

10.154.11.144

Port

443

Service Name (Optional)

Apache Tomcat HTT

Use Template

Select a Template ▼

Protocol

tcp ▼

Cancel

Add this Virtual Service

2. Type a valid **Virtual Address**.

3. Type **443** as the **Port**.

4 Configure the LoadMaster

4. Enter a recognizable **Service Name**, such as **Apache Tomcat HTTPS Re-encrypt** Virtual Service.

5. Click **Add this Virtual Service**.

6. Configure the settings as recommended in the following table:

Section	Option	Value	Comments
Standard Options	Persistence Mode	Active Cookie	
	Timeout	1 Hour	
	Cookie name	JSESSIONID	
	Scheduling Method	least connection	
	Idle Connection Timeout	900	
SSL Properties	SSL Acceleration	Enabled	
	Cipher Set	Best Practices	
Advanced Properties	Add a Port 80 Redirector VS	https://%h%s	Click Add HTTP Redirector . This automatically creates a redirect on port 80.

7. Add the Real Servers:

- Expand the **Real Servers** section.
- Click **Add New**.
- Enter the address of the relevant Real Server.
- Complete the other fields as required.
- Click **Add this Real Server** then click **OK** to the pop-up message.
- Repeat the steps above to add more Real Servers as needed, based on your environment.

Create an Apache Tomcat HTTPS Re-encrypt Redirect Virtual Service

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Clicking the **Add HTTP Redirector** button automatically creates a port 80 redirect Virtual Service. This is optional, but the purpose of this Virtual Service is to redirect any clients who have connected using HTTP to the HTTPS Virtual Service. Kemp also recommends changing the **Real Server Check Method** and **Persistence Mode** to **None**.

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.