



IIS

## Deployment Guide

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# 1 Introduction

Internet Information Services (IIS, formerly Internet Information Server) is an extensible web server created by Microsoft for use with Windows NT family. IIS supports HTTP, HTTPS, FTP, FTPS, SMTP and NNTP. It has been an integral part of the Windows NT family since Windows NT 4.0, though it may be absent from some editions (for example, Windows XP Home edition), and is not active by default.

The Kemp LoadMaster is used to load balance the IIS 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 IIS 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 IIS server.

# 2 Template

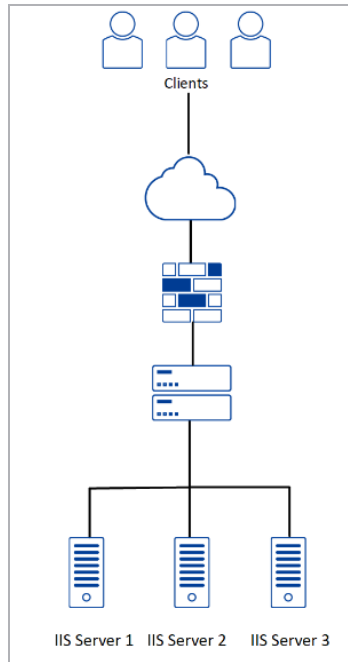
Kemp has developed a template containing our recommended settings for this workload. You can install this template to help create Virtual Services (VSs) because it automatically populates the settings. You can use the template to easily create the required VSs with the recommended settings. For some 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.

# 3 Architecture



# 4 Configure the LoadMaster

The deployed IIS 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.

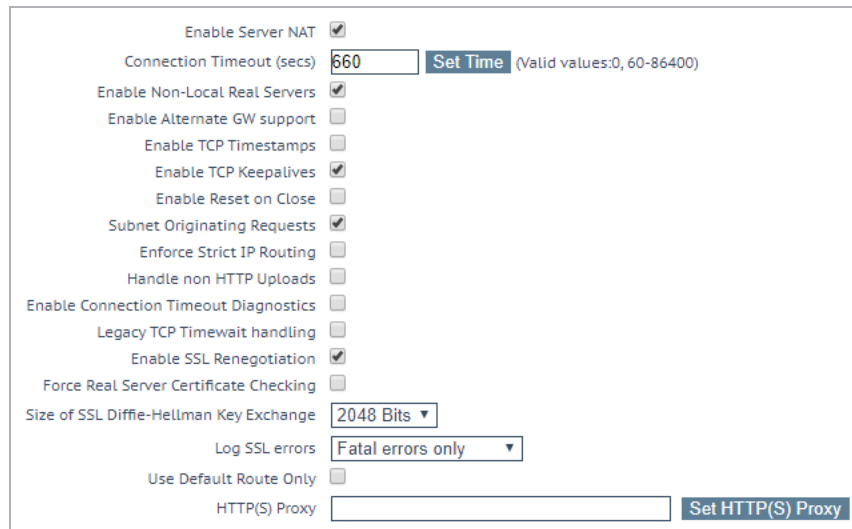
When **Subnet Originating Requests** is enabled, the LoadMaster routes traffic so that the Real Server sees traffic arriving from the LoadMaster interface that is in that network/subnet.

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 ☒

Connection Timeout (secs)  [Set Time](#) (Valid values:0, 60-86400)

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

Log SSL errors

Use Default Route Only ☐

HTTP(S) Proxy  [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**.



## 4 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 type="checkbox"/>
Drop at Drain Time End	<input type="checkbox"/>
L7 Connection Drain Time (secs)	300 <span>Set Time</span> (Valid values:0, 60 - 86400)
L7 Authentication Timeout (secs)	30 <span>Set Timeout</span> (Valid values:30 - 300)
L7 Client Token Timeout (secs)	120 <span>Set Timeout</span> (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 <span>Set Slow Start</span> (Valid values:0 - 600)
Share SubVS Persistence	<input type="checkbox"/>
Log Insight Message Split Interval	10 <span>Set Log Split Interval</span> (Valid values:1 - 100)
Include User Agent Header in User Logs	<input type="checkbox"/>
Use CEF Log Format	<input type="checkbox"/>

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

**Enable Check Persist** is not required if active cookie is enabled.

## 4.3 Create the IIS Virtual Services

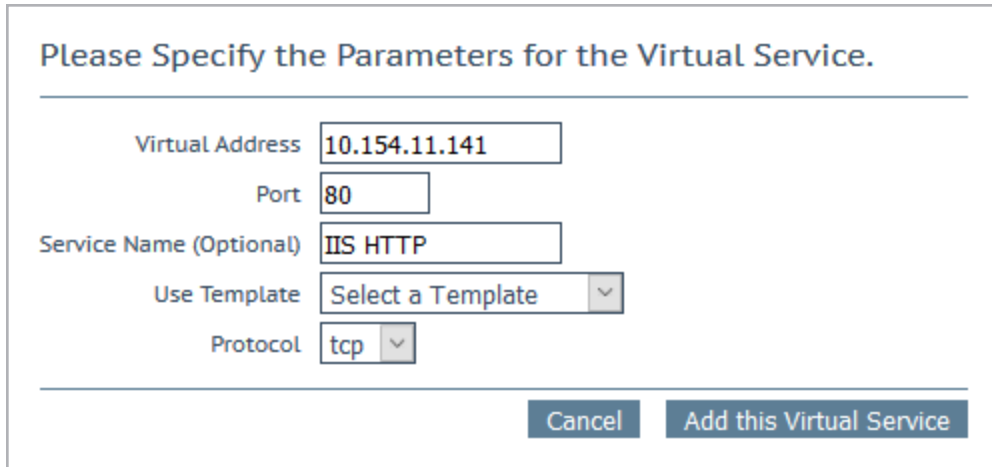
The following sections describe the recommended settings for the IIS Virtual Services.

### 4.3.1 Create an IIS HTTP Virtual Service

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

## 4 Configure the LoadMaster

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

Protocol

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

Section	Option	Value	Comment
Standard Options	Timeout	1 Hour	
	Cookie name	JSESSIONID	
	Scheduling Method	least connection	

7. Add the Real Servers:
8. Expand the **Real Servers** section.
9. Click **Add New**.
  - a) Enter the address of the relevant Real Server.
  - b) Complete the other fields as required.
  - c) Click **Add this Real Server** then click **OK** to the pop-up message.

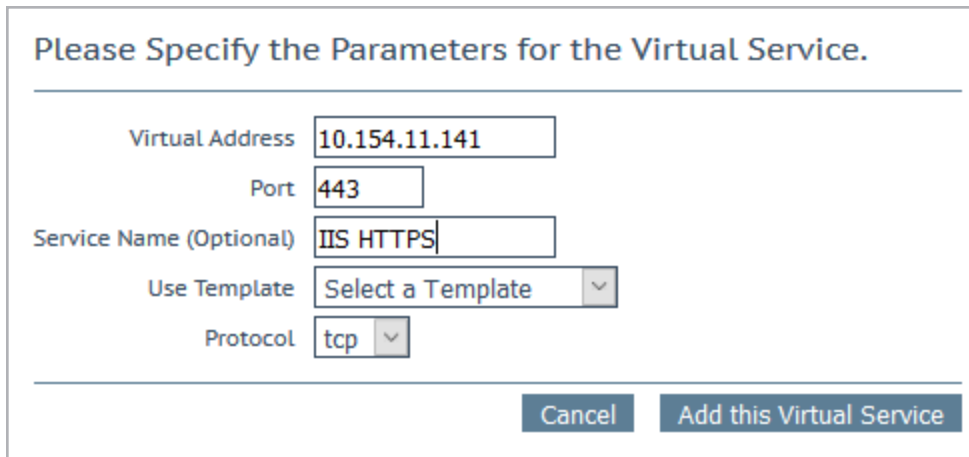
## 4 Configure the LoadMaster

d) Repeat the steps above to add more Real Servers as needed, based on your environment.

### 4.3.2 Create an IIS HTTPS Virtual Service

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

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



2. Type a valid **Virtual Address**.
3. Type **443** as the **Port**.
4. Enter a recognizable **Service Name**, such as **IIS 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	

## 4 Configure the LoadMaster

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

7. Add the Real Servers:

8. Expand the **Real Servers** section.

9. Click **Add New**.

a) Enter the address of the relevant Real Server.

b) Complete the other fields as required.

c) Click **Add this Real Server** then click **OK** to the pop-up message.

d) Repeat the steps above to add more Real Servers as needed, based on your environment.

#### Create an IIS 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 IIS HTTPS Offloaded Virtual Service

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

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

## 4 Configure the LoadMaster

**Please Specify the Parameters for the Virtual Service.**

---

Virtual Address

Port

Service Name (Optional)

Use Template

Protocol

---

2. Type a valid **Virtual Address**.
3. Type **443** as the **Port**.
4. Enter a recognizable **Service Name**, such as **IIS HTTPS Offloaded HTTP** 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	Active Cookie	SSL Acceleration must be enabled before you can select Active Cookie as a Persistence Mode.
	Timeout	1 Hour	
	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 <b>Add HTTP Redirector</b> . This automatically creates a redirect on port 80.
Real	Real Server	HTTPS	

## 4 Configure the LoadMaster

Section	Option	Value	Comment
Servers	Check Method	Protocol	
	URL	/	

7. Add the Real Servers:

8. Expand the **Real Servers** section.

9. Click **Add New**.

a) Enter the address of the relevant Real Server.

b) Complete the other fields as required.

c) Click **Add this Real Server** then click **OK** to the pop-up message.

d) Repeat the steps above to add more Real Servers as needed, based on your environment.

### Create an IIS HTTPS Offloaded 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 IIS HTTPS Re-encrypt Virtual Service

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

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

## 4 Configure the LoadMaster

Please Specify the Parameters for the Virtual Service.

Virtual Address

10.154.11.143

Port

443

Service Name (Optional)

IIS HTTPS Re-encrypt

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 IIS HTTPS Re-encrypt 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	Active Cookie	SSL Acceleration must be enabled before you can select Active Cookie as a Persistence Mode.
	Timeout	1 Hour	
	Cookie name	JSESSIONID	
	Scheduling Method	least connection	
	Idle Connection Timeout	900	
SSL Properties	SSL Acceleration	Enabled	
	Reencrypt	Enabled	
	Cipher Set	Best Practices	

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

7. Add the Real Servers:

8. Expand the **Real Servers** section.

9. Click **Add New**.

a) Enter the address of the relevant Real Server.

b) Complete the other fields as required.

c) Click **Add this Real Server** then click **OK** to the pop-up message.

d) Repeat the steps above to add more Real Servers as needed, based on your environment.

### Create an IIS HTTPS Re-encrypt 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**.

## 4.4 Create the IIS and WAF Virtual Services

The following sections describe the recommended settings for the IIS and WAF Virtual Services.

### 4.4.1 Create an IIS HTTP and WAF Virtual Service

The following are the steps involved and the recommended settings to configure the IIS HTTP WAF Virtual Service:

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



## 4 Configure the LoadMaster

Please Specify the Parameters for the Virtual Service.

---

Virtual Address

Port

Service Name (Optional)

Use Template

Protocol

---

2. Type a valid **Virtual Address**.
3. Type **80** as the **Port**.
4. Enter a recognizable **Service Name**, such as IIS HTTP WAF 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	Source IP Address
	Timeout	6 Minutes
	Scheduling Method	least connection
WAF Options	Enabled	Yes
	Default Operation	Block Mode
	Audit mode	Audit Relevant
	Enabled Rules	owasp_protocol_violations
		owasp_protocol_anomalies
		owasp_request_limits
		owasp_bad_robots
		owasp_generic_attacks

## 4 Configure the LoadMaster

Section	Option	Value
		owasp_xss_attacks
		owasp trojans
		owasp_common_exceptions
	Application Specific	iis_attacks
Real Servers	Real Server Check Method	HTTPS Protocol
Real Servers	URL	/

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

#### 4.4.2 Create an IIS HTTPS Offloaded and WAF Virtual Service

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

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

## 4 Configure the LoadMaster

Please Specify the Parameters for the Virtual Service.

Virtual Address

10.154.11.144

Port

443

Service Name (Optional)

IIS HTTPS Offloaded

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 IIS HTTPS Offloaded WAF 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	Source IP Address	
	Timeout	6 Minutes	
	Scheduling Method	least connection	
	Idle Connection Timeout	900	
SSL Properties	Enabled	Selected	
	Cipher Set	Best Practices	
Advanced Properties	Add a Port 80 Redirector VS	https://%h%s	Click <b>Add HTTP Redirector</b> . This automatically creates a redirect on port 80.
WAF Options	Enabled	Yes	

## 4 Configure the LoadMaster

Section	Option	Value	Comments
	Default Operation	Block Mode	
	Audit Mode	Audit Relevant	
	Enabled Rules	owasp_protocol_violations	
		owasp_protocol_anomalies	
		owasp_request_limits	
		owasp_bad_robots	
		owasp_generic_attacks	
		owasp_xss_attacks	
		owasp_trojans	
		owasp_common_exceptions	
	Application Specific	iis_attacks	
Real Servers	Real Server Check Method	HTTPS Protocol	
Real Servers	URL	/	

7. Add the Real Servers:

8. Expand the **Real Servers** section.

9. Click **Add New**.

a) Enter the address of the relevant Real Server.

b) Complete the other fields as required.

## 4 Configure the LoadMaster

- c) Click **Add this Real Server** then click **OK** to the pop-up message.
- d) Repeat the steps above to add more Real Servers as needed, based on your environment.

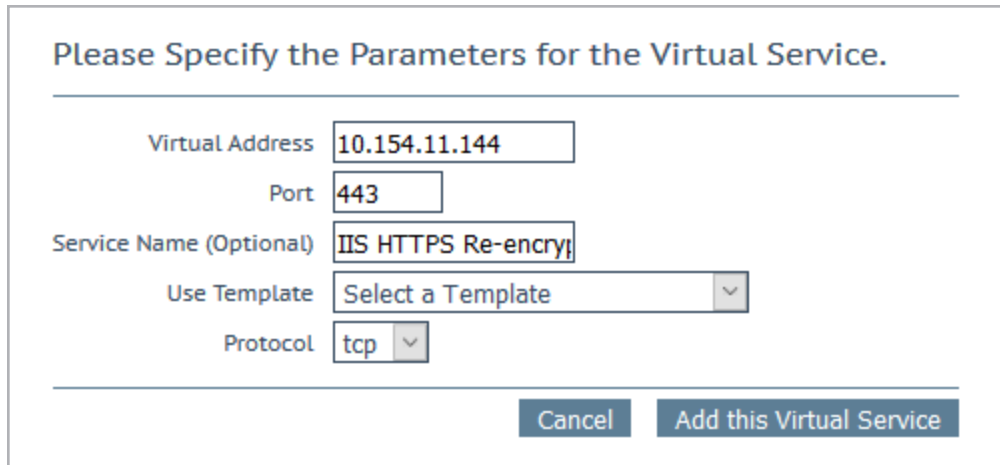
### Create an IIS HTTPS Offloaded and WAF Redirect Virtual Service

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**.

#### 4.4.3 Create an IIS HTTPS Re-encrypt and WAF Virtual Service

The following are the steps involved and the recommended settings to configure the IIS HTTPS Re-encrypt and WAF 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	<input type="text" value="10.154.11.144"/>
Port	<input type="text" value="443"/>
Service Name (Optional)	<input type="text" value="IIS HTTPS Re-encrypt"/>
Use Template	<input type="text" value="Select a Template"/>
Protocol	<input type="text" value="tcp"/>

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

## 4 Configure the LoadMaster

Section	Option	Value	Comments
Standard Options	Persistence Mode	Source IP Address	
	Timeout	6 Minutes	
	Scheduling Method	least connection	
	Idle Connection Timeout	900	
SSL Properties	Enabled	Selected	
	Reencrypt	Selected	
	Cipher Set	Best Practices	
Advanced Properties	Add a Port 80 Redirector VS	https://%h%s	Click <b>Add HTTP Redirector</b> . This automatically creates a redirect on port 80.
WAF Options	Enabled	Yes	
	Default Operation	Block Mode	
	Audit mode	Audit Relevant	
	Enabled Rules	owasp_protocol_violations	
		owasp_protocol_anomalies	
		owasp_request_limits	
		owasp_bad_robots	
		owasp_generic_attacks	
		owasp_xss_	

## 4 Configure the LoadMaster

Section	Option	Value	Comments
		attacks	
		owasp_trojans	
		owasp_ common_ exceptions	
	Application Specific	iis_attacks	
Real Servers	Real Server Check Method	HTTPS Protocol	
Real Servers	URL	/	

7. Add the Real Servers:

8. Expand the **Real Servers** section.

9. Click **Add New**.

a) Enter the address of the relevant Real Server.

b) Complete the other fields as required.

c) Click **Add this Real Server** then click **OK** to the pop-up message.

d) Repeat the steps above to add more Real Servers as needed, based on your environment.

### Create an IIS HTTPS Re-encrypt and WAF 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**.

# 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.