



# MS Skype For Business 2019

## Deployment Guide

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# Table of Contents

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<b>1 Introduction</b>	<b>8</b>
1.1 Microsoft Skype for Business 2019	8
1.2 Intended Audience	8
1.3 Document Purpose	8
1.4 Prerequisites	9
<b>2 Load Balancing Microsoft Skype for Business 2019</b>	<b>10</b>
<b>3 Template</b>	<b>12</b>
<b>4 General Configuration</b>	<b>13</b>
4.1 Disable SNAT Globally	13
4.2 Change Drop Connections Settings	13
4.3 Increase the Connection Drain Time	14
4.4 Connection Scaling for Large Scale Deployments	14
4.5 Layer 4 Considerations before Deployment	15
4.6 Enable Subnet Originating Requests Globally	16
4.7 Enable Check Persist Globally	17
<b>5 Configuring Skype for Business 2019 Virtual Services</b>	<b>19</b>
5.1 DNS Configuration	19
5.1.1 Director DNS	20
5.1.1.1 Deploy Director DNS Template	20
5.1.1.2 Configure Director DNS WebSvc HTTP Virtual Service	20

---

5.1.1.2.1 Director DNS WebSvc HTTP Virtual Service Recommended API Settings (optional) .....	21
5.1.1.3 Configure Director DNS WebSvc HTTPS Virtual Service .....	22
5.1.1.3.1 Director DNS WebSvc HTTPS Virtual Service Recommended API Settings (optional) .....	22
5.1.2 Front End DNS .....	23
5.1.2.1 Deploy Front End DNS Template .....	23
5.1.2.2 Configure Front End DNS WebSvc HTTP Virtual Service .....	23
5.1.2.2.1 Front End DNS WebSvc HTTP Virtual Service Recommended API Settings (optional) .....	24
5.1.2.3 Configure Front End DNS WebSvc HTTPS Virtual Service .....	25
5.1.2.3.1 Front End DNS WebSvc HTTPS Virtual Service Recommended API Settings (optional) .....	25
5.2 HLB Only Configuration .....	26
5.2.1 Director HLB Only .....	26
5.2.1.1 Deploy Director HLB Only Template .....	26
5.2.1.2 Configure Director HLB WebSvc HTTP Virtual Service .....	27
5.2.1.2.1 Director HLB WebSvc HTTP Virtual Service Recommended API Settings (Optional) .....	27
5.2.1.3 Configure Director HLB WebSvc HTTPS Virtual Service .....	28
5.2.1.3.1 Director HLB WebSvc HTTPS Virtual Service Recommended API Settings (optional) .....	28
5.2.1.4 Configure Director HLB SIP Virtual Service .....	29
5.2.1.4.1 Director HLB SIP Virtual Service Recommended API Settings (optional) .....	30
5.2.2 Front End HLB Only .....	30

---

5.2.2.1 Deploy Front End HLB Only Template .....	30
5.2.2.2 Configure Front End HLB WebSvc HTTP Virtual Service .....	31
5.2.2.2.1 Front End HLB WebSvc HTTP Virtual Service Recommended API Settings (optional) .....	32
5.2.2.3 Configure Front End HLB WebSvc HTTPS Virtual Service .....	32
5.2.2.3.1 Front End HLB WebSvc HTTPS Virtual Service Recommended API Settings (optional) .....	33
5.2.2.4 Configure Front End HLB DCOM Virtual Service .....	33
5.2.2.4.1 Front End HLB DCOM Virtual Service Recommended API Settings (optional) ...	34
5.2.2.5 Configure Front End HLB SIP Virtual Service .....	35
5.2.2.5.1 Front End HLB SIP Virtual Service Recommended API Settings (optional) .....	35
5.2.3 Mediation HLB Only Virtual Service .....	36
5.2.3.1 Mediation HLB Virtual Service Recommended API Settings (optional) .....	37
5.2.4 Edge Internal HLB Only .....	37
5.2.4.1 Deploy Edge Internal HLB Template .....	38
5.2.4.2 Configure Edge Internal HLB AV Media TCP Virtual Service .....	38
5.2.4.2.1 Edge Internal HLB AV Media TCP Virtual Service Recommended API Settings (optional) .....	39
5.2.4.3 Configure Edge Internal HLB AV Media UDP Virtual Service .....	40
5.2.4.3.1 Edge Internal HLB AV Media UDP Virtual Service Recommended API Settings (optional) .....	40
5.2.4.4 Configure Edge Internal HLB SIP Virtual Service .....	41
5.2.4.4.1 Edge Internal HLB SIP Virtual Service Recommended API Settings (optional) ..	41
5.3 Configure External Edge Virtual Services .....	42

---

5.3.1 Edge External HLB Only .....	42
5.3.1.1 Deploy Edge External HLB Template .....	42
5.3.1.2 Configure Edge External HLB SIP Virtual Service .....	43
5.3.1.2.1 Edge External HLB SIP Virtual Service Recommended API Settings (optional) ..	43
5.3.1.3 Configure Edge External HLB SIP Federation Virtual Service .....	44
5.3.1.3.1 Edge External HLB SIP Federation Virtual Service Recommended API Settings (optional) .....	44
5.3.2 Edge External Conferencing .....	45
5.3.2.1 Edge External HLB Conferencing Virtual Service Recommended API Settings (optional) .....	46
5.3.3 Edge External AV HLB Only .....	46
5.3.3.1 Deploy Edge External AV HLB Template .....	47
5.3.3.2 Configure Edge External HLB AV Media TCP Virtual Service .....	47
5.3.3.2.1 Edge External HLB AV Media TCP Virtual Service Recommended API Settings (optional) .....	48
5.3.3.3 Configure Edge External HLB AV Media UDP Virtual Service .....	48
5.3.3.3.1 Edge External HLB Media UDP Virtual Service Recommended API Settings (optional) .....	49
5.4 Common to Both with Templates .....	49
5.4.1 Office Online Servers Virtual Service .....	50
5.4.1.1 Office Online Servers Virtual Service Recommended API Settings (optional) .....	51
5.4.2 Director Reverse Proxy .....	51
5.4.2.1 Deploy Director Reverse Proxy Template .....	52
5.4.2.2 Configure Director Reverse Proxy HTTP Virtual Service .....	52

---

5.4.2.2.1 Director Reverse Proxy HTTP Virtual Service Recommended API Settings (optional) .....	53
5.4.2.3 Configure Director Reverse Proxy HTTPS Virtual Service .....	53
5.4.2.3.1 Director Reverse Proxy HTTPS Virtual Service Recommended API Settings (optional) .....	54
5.4.3 Front End Reverse Proxy .....	55
5.4.3.1 Deploy Front End Reverse Proxy Template .....	55
5.4.3.2 Configure Front End Reverse Proxy HTTP Virtual Service .....	56
5.4.3.2.1 Front End Reverse Proxy HTTP Virtual Service Recommended API Settings (optional) .....	57
5.4.3.3 Configure Front End Reverse Proxy HTTPS Virtual Service .....	57
5.4.3.3.1 Front End Reverse Proxy HTTPS Virtual Service Recommended API Settings (optional) .....	58
<b>6 Additional Information .....</b>	<b>60</b>
6.1 Server Maintenance .....	60
6.2 Loss of Failover while using DNS .....	60
6.3 Hardware Load Balancing .....	60
<b>7 References .....</b>	<b>61</b>
<b>Last Updated Date .....</b>	<b>62</b>

# 1 Introduction

Kemp's LoadMaster family of purpose-built hardware and Virtual LoadMasters (VLMs) offer advanced Layer 4 and Layer 7 server load balancing, content switching, SSL Acceleration, and a multitude of other advanced Application Delivery and Optimization (ADC) features.

Kemp's LoadMaster fully supports Microsoft's key solutions and are approved by Microsoft. The LoadMaster efficiently distributes user traffic for Microsoft Skype for Business 2019 so that users get the best experience possible.

The entire Kemp LoadMaster product family, including the Virtual LoadMaster (VLM) supports Microsoft Skype for Business 2019.

For more information about Kemp, visit us online at [www.kemptechnologies.com](http://www.kemptechnologies.com).

## 1.1 Microsoft Skype for Business 2019

Microsoft Skype for Business 2019 is a communications tool that provides services such as audio/video conferencing, Instant Messaging (IM), and Voice over Internet Protocol (VoIP). You can access these services from the internet, or from an internal network. Microsoft Skype for Business 2019 allows companies to enhance collaboration amongst employees.

A number of enhancements have been made in Microsoft Skype for Business 2019. The network topology setup is quite similar to the previous version (Skype for Business 2015) but with a number of small differences. The Director role is still optional and is not recommended. Less servers are needed because front-end servers can now take the role of Director. The Persistent Chat role is now deprecated as is the support for Extensible Messaging and Presence Protocol (XMPP) on the Edge Servers.

## 1.2 Intended Audience

Anyone interested in configuring the Kemp LoadMaster to load balance Skype for Business 2019.

## 1.3 Document Purpose

This documentation is intended to provide guidance on how to configure Kemp LoadMaster products to provide High Availability (HA) for a Microsoft Skype for Business 2019 environment. This documentation was created using a representative sample environment described later in the



document. Because this documentation is not intended to cover every possible deployment scenario, it may not address your unique setup or requirements. The Kemp Support Team is available to provide solutions for scenarios not explicitly defined.

### 1.4 Prerequisites

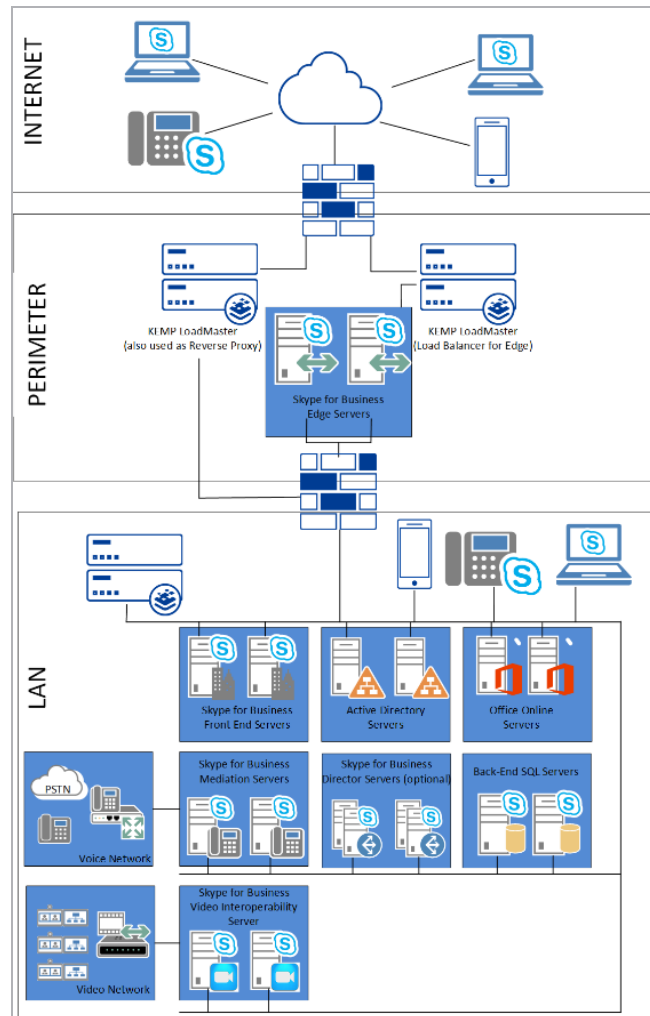
It is assumed that the reader is a network administrator or a person otherwise familiar with networking and general computer terminology. It is further assumed that the Microsoft Skype for Business 2019 environment is set up and the Kemp LoadMaster is installed.

Other LoadMaster documentation can be referred to as needed from the [Kemp Documentation page](#).

The minimum requirements that should be met before proceeding are as follows:

- Installed LoadMaster LTS firmware version or above
- Configured and published Microsoft Skype for Business 2019 architecture with Skype for Business Topology builder
- Installed the Microsoft Servers, Active Directories, and followed other Microsoft requirements
- Configured internal and external DNS entries for Front-End, Director, and Edge pools
- Established access to the LoadMaster Web User Interface (WUI)

## 2 Load Balancing Microsoft Skype for Business 2019



Deploying a Microsoft Skype for Business 2019 environment can require multiple servers in Front-End pools and Edge server pools. Load balancing is necessary in this situation to distribute the traffic amongst these servers.

Microsoft Skype for Business 2019 supports two load balancing solutions: DNS load balancing and Hardware Load Balancing (HLB). Hardware load balancers are also required to provide load balancing for the internal and external web services when DNS load balancing is used.

Different load balancing methods cannot be used on the Edge internal and Edge external interfaces, that is, DNS load balancing cannot be used on the Edge internal interface when hardware load balancing is being used on the Edge external interface. Health checking at the LoadMaster ensures that, if one of the servers becomes inaccessible, the load balancer will take the sever offline and automatically re-route and reconnect users to other functioning servers.

Kemp recommend the configuration as depicted in the above diagram. If your configuration differs from the recommended configuration and there are issues deploying the LoadMaster, please contact the local Kemp Support Team for assistance.

# 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. 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.

# 4 General Configuration

Some recommended general LoadMaster configuration settings are outlined below. These options can be set within the LoadMaster WUI.

## 4.1 Disable SNAT Globally

By default, global Server Network Address Translation (SNAT) is enabled in the LoadMaster settings. Kemp recommends disabling SNAT globally when using the LoadMaster with a Skype for Business 2019 Edge deployment. To disable SNAT globally, follow the steps below:

1. In the main menu, select **System Configuration**.
2. Select **Miscellaneous Options**.
3. Select **Network Options**.



4. Clear the **Enable Server NAT** check box.

## 4.2 Change Drop Connections Settings

The LoadMaster must be configured to drop connections on Real Server Failure to have fast failover for clients to another Real Server.

To configure dropping connections, perform the following steps:

1. Click **System Configuration**.
2. Click **Miscellaneous Options**.
3. Click **L7 Configuration**.



4. Select the **Drop Connections on RS** failure check box.

### 4.3 Increase the Connection Drain Time

The LoadMaster Connection Timeout must be set to 1 day. The reason why this value can be set so high is because the LoadMaster monitors client connection to Real Servers and if a server fails then the LoadMaster can drop the associated client connections to that Real Server. Clients are disconnected from the LoadMaster and then reconnected to the LoadMaster to connect to another Real Server.

One day is the maximum value for this setting and it must be used in conjunction with the **Drop at Drain Time End** option.

1. To configure the Connection Timeout, click **System Configuration**.
2. Click **Miscellaneous Options**.
3. Click **L7 Configuration**.



4. Enter **86400** (1 day) in the **L7 Connection Drain Time (secs)** field and click **Set Time**.

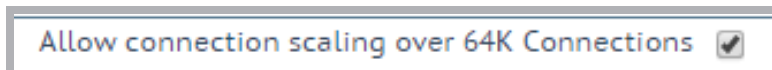
### 4.4 Connection Scaling for Large Scale Deployments

Execution of this procedure is optional and should be used only in cases where network traffic is expected to be greater than 64,000 server connections at any one time.

L7 Transparency must be disabled to use connection scaling.

To use connection scaling, perform the following steps:

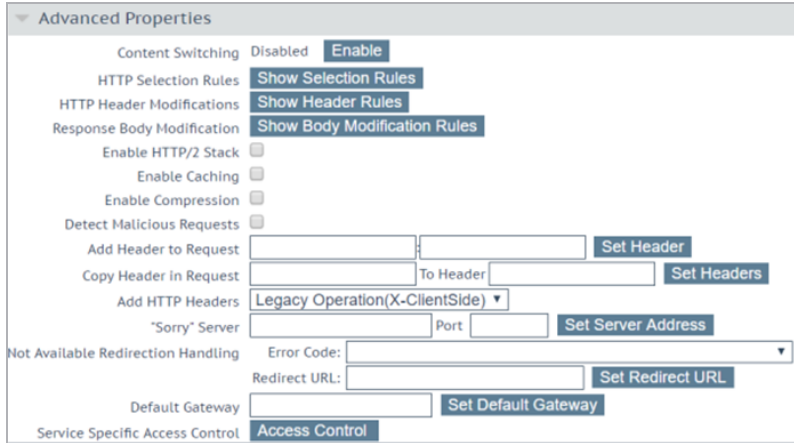
1. Click **System Configuration**.
2. Click **Miscellaneous Options**.
3. Click **L7 Configuration**.



4. Select the **Allow connection scaling over 64K Connections** check box.
5. Click **Virtual Services**.

## 4 General Configuration

6. Click **View/Modify Services**.
7. Click the **Modify** button of the appropriate Virtual IP Address.
8. Expand the **Advanced Properties** section.

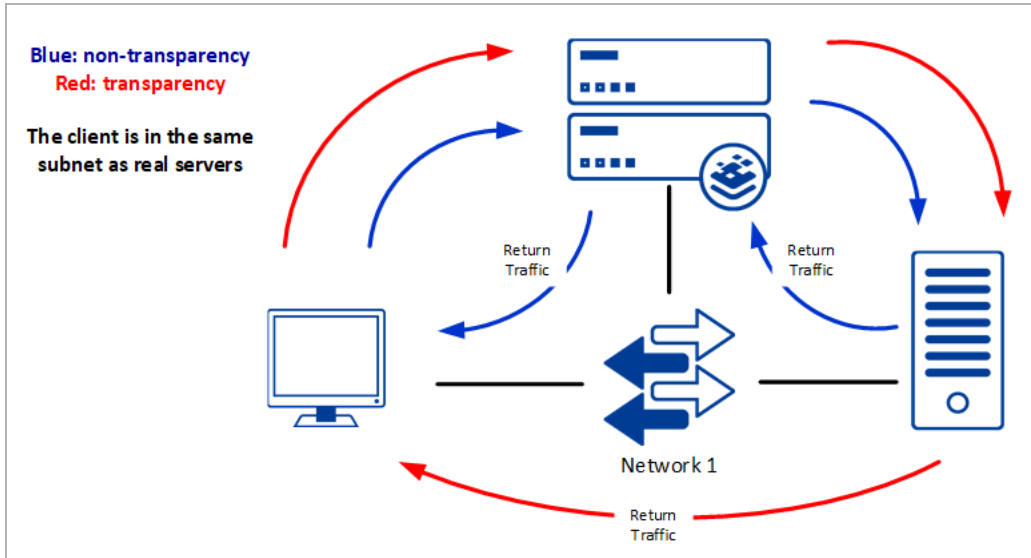


9. In the **Advanced Properties** panel, input a list of **Alternate Source Addresses**. Multiple IPv4 addresses must be separated with a space; each must be unallocated and allow 64K connections.
10. Click the **Set Alternate Source Addresses** button.

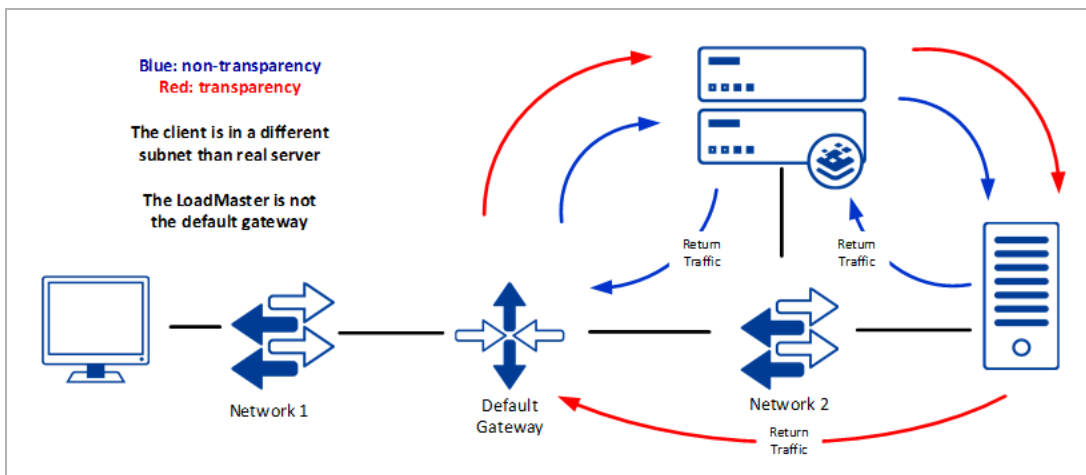
## 4.5 Layer 4 Considerations before Deployment

For this application, if you are using an L4 service, it is automatically transparent. When using transparency, the following steps must be followed:

If clients are on the same subnet as the Real Server, returning traffic to the LoadMaster is instead sent to the client. This is asymmetric routing and causes the client to drop the connection because it is expecting it from the LoadMaster, not the Real Server. The diagram below shows the flow of traffic when this rule is not followed.



If the Real Servers' default gateway is not set to be the LoadMaster's interface (the shared IP if the LoadMasters are in HA), traffic returning to the LoadMaster is instead sent to the gateway. This is asymmetric routing and causes the connection to drop because the connection should be sent from the LoadMaster, not the Real Server. The diagram below shows the flow of traffic when this rule is not followed.



## 4.6 Enable Subnet Originating Requests Globally

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



#### 4 General Configuration

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.

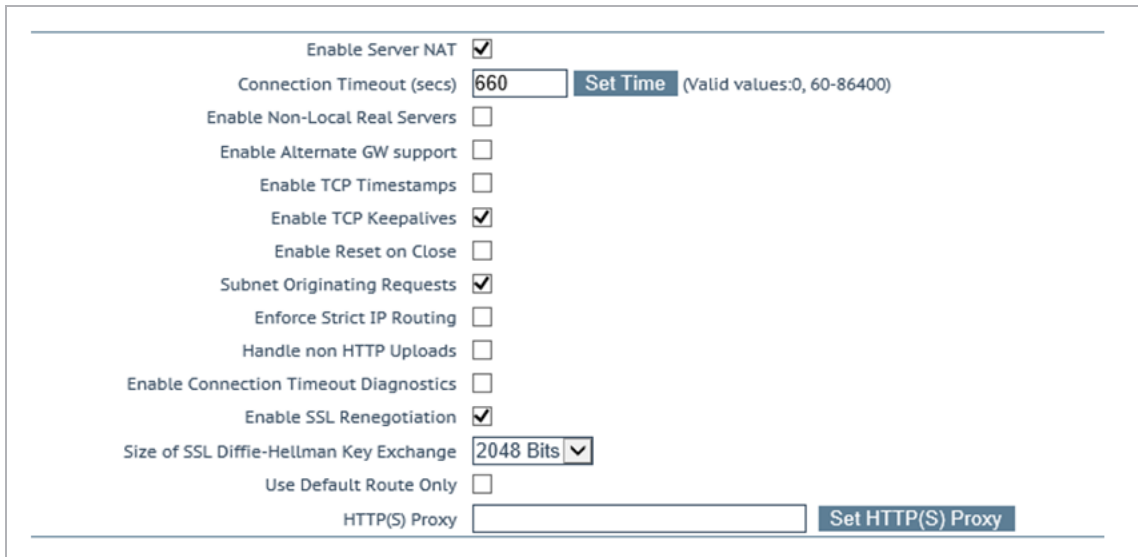
In a two-armed setup where the Virtual Service is on network/subnet A, for example, and the Real Servers are on network B, **Subnet Originating Requests** should be enabled on LoadMasters with firmware version 7.1-16 and above.

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**.



Enable Server NAT	<input checked="" type="checkbox"/>
Connection Timeout (secs)	660 <span>Set Time</span> (Valid values:0, 60-86400)
Enable Non-Local Real Servers	<input 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"/>
Enable SSL Renegotiation	<input checked="" type="checkbox"/>
Size of SSL Diffie-Hellman Key Exchange	2048 Bits
Use Default Route Only	<input type="checkbox"/>
HTTP(S) Proxy	<input type="text"/> <span>Set HTTP(S) Proxy</span>

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

## 4.7 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 General Configuration

Allow connection scaling over 64K Connections	<input type="checkbox"/>
Always Check Persist	<b>Yes - Accept Changes ▼</b>
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)	<input type="text" value="86400"/> <b>Set Time</b> (Valid values:0 - 86400)
L7 Authentication Timeout (secs)	<input type="text" value="30"/> <b>Set Timeout</b> (Valid values:30 - 300)
L7 Client Token Timeout (secs)	<input type="text" value="120"/> <b>Set Timeout</b> (Valid values:60 - 300)
Additional L7 Header	<b>X-Forwarded-For ▼</b>
100-Continue Handling	<b>RFC-7231 Compliant ▼</b>
Allow Empty POSTs	<input type="checkbox"/>
Allow Empty HTTP Headers	<input type="checkbox"/>
Force Complete RS Match	<input type="checkbox"/>
Least Connection Slow Start	<input type="text" value="0"/> <b>Set Slow Start</b> (Valid values:0 - 600)
Share SubVS Persistence	<input type="checkbox"/>
Log Insight Message Split Interval	<input type="text" value="10"/> <b>Set Log Split Interval</b> (Valid values:1 - 100)
Include User Agent Header in User Logs	<input type="checkbox"/>

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

# 5 Configuring Skype for Business 2019 Virtual Services

This deployment guide covers three types of Virtual Service; **DNS Only**, **HLB only** and those that are common to both types of environment. The below sections provide instructions and recommended configuration options for setting up a Kemp LoadMaster to work with Skype for Business 2019 with the use of Virtual Service templates.

The table in each section outlines the API settings and values. You can use this information when using the Kemp LoadMaster API and automation tools.

For an explanation of each of the fields mentioned, refer to the [Kemp Documentation Page](#).

## 5.1 DNS Configuration

Refer to the sections below for instructions on how to set up the LoadMaster using a DNS only configuration using the Kemp templates.

Microsoft recommends that DNS load balancing is used for Session Initiation Protocol (SIP) traffic. Microsoft also recommends that web services are configured to override FQDN for internal web services.

### Source IP Persistence

Source IP persistence can be used but take care before enabling it because:

- Clients from behind a NAT device show up as a single IP
- It can result in uneven connection distribution

### Cookies

If cookies are used, there is no negative impact. However, there are some requirements:

- The cookie must be named **MS-WSMAN**
- It must not expire

- It must not be marked httpOnly
- Cookie optimization should be turned off

To configure the various Virtual Services, refer to the sections below.

### 5.1.1 Director DNS

The Skype Director DNS template contains two Virtual Services:

- Skype 2019 Director DNS - WebSvc HTTP
- Skype 2019 Director DNS - WebSvc HTTPS

#### 5.1.1.1 Deploy Director DNS Template

To add the Virtual Services for Skype 2019 Director DNS with the template, follow the steps below:

1. Click the **Add New** button.

Please Specify the Parameters for the Virtual Service.

Virtual Address	<input type="text" value="10.10.99.50"/>
Port	<input type="text" value="80"/>
Service Name (Optional)	<input type="text" value="Skype 2019 Director"/>
Use Template	<input type="text" value="Skype 2019 Director DNS"/>
Protocol	<input type="text" value="tcp"/>

2. Enter a **Virtual Address**.
3. Select the **Skype 2019 Director DNS** template from the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.

#### 5.1.1.2 Configure Director DNS WebSvc HTTP Virtual Service

To configure the Skype for Business 2019 Director WebSvc HTTP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.50:80	tcp	Skype 2019 Director DNS - WebSvc HTTP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.50:443(+1)	tcp	Skype 2019 Director DNS - WebSvc HTTPS	L7	on Real Server	⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Director DNS - WebSvc HTTP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 80** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.1.1.2.1 Director DNS WebSvc HTTP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	80
prot	tcp
ForceL7	1
Transparent	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	5061

### 5.1.1.3 Configure Director DNS WebSvc HTTPS Virtual Service

To configure the Skype 2019 Director DNS - WebSvc HTTPS Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.50:80	tcp	Skype 2019 Director DNS - WebSvc HTTP	L7		<span>✖ Down</span>		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.50:443(+1)	tcp	Skype 2019 Director DNS - WebSvc HTTPS	L7	on Real Server	<span>✖ Down</span>		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Director DNS - WebSvc HTTPS** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 443** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.1.1.3.1 Director DNS WebSvc HTTPS Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
ForceL7	1
Transparent	0
ExtraPorts	444
Persist	src
PersistTimeout	1200
Schedule	lc

API Parameter	API Value
UseforSnat	1
IdleTime	1800
CheckType	tcp
CheckPort	5061

### 5.1.2 Front End DNS

The Skype Front End DNS template contains two Virtual Services:

- Skype 2019 Front End DNS - WebSVC HTTP
- Skype 2019 Front End DNS - WebSVC HTTPS

#### 5.1.2.1 Deploy Front End DNS Template

To add the Virtual Services for Skype for Business Front End with the template, follow the steps below:

1. Click the **Add New** button.

Please Specify the Parameters for the Virtual Service.

Virtual Address	<input type="text" value="10.10.99.51"/>
Port	<input type="text" value="80"/>
Service Name (Optional)	<input type="text" value="Skype 2019 Front E"/>
Use Template	<input type="text" value="Skype 2019 Front End DNS"/>
Protocol	<input type="text" value="tcp"/>

2. Enter a **Virtual Address**.
3. Select the **Skype 2019 Front End DNS** template under **Use Template**.
4. Click **Add This Virtual Service**.

#### 5.1.2.2 Configure Front End DNS WebSvc HTTP Virtual Service

To configure the Skype 2019 Front End DNS - WebSVC HTTP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.51:80	tcp	Skype 2019 Front End DNS - WebSVC HTTP	L7		⛔ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:443(+1)	tcp	Skype 2019 Front End DNS - WebSVC HTTPS	L7	on Real Server	⛔ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Front End DNS - WebSVC HTTP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 80** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.1.2.2.1 Front End DNS WebSvc HTTP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	80
prot	tcp
ForceL7	1
Transparent	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	5061



### 5.1.2.3 Configure Front End DNS WebSvc HTTPS Virtual Service

To configure the Skype 2019 Front End DNS - WebSVC HTTPS Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.51:80	tcp	Skype 2019 Front End DNS - WebSVC HTTP	L7		⛔ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:443(+1)	tcp	Skype 2019 Front End DNS - WebSVC HTTPS	L7	on Real Server	⛔ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Front End DNS - WebSVC HTTPS** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**
5. Enter the **Real Server Address**.
6. Confirm that **Port 443** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.1.2.3.1 Front End DNS WebSvc HTTPS Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
ForceL7	1
Transparent	0
ExtraPorts	444
Persist	src
PersistTimeout	1200
Schedule	lc

API Parameter	API Value
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	5061

## 5.2 HLB Only Configuration

The HLB only configuration instructions using the Kemp Templates are below.

### 5.2.1 Director HLB Only

The Skype Director HLB Only template contains three Virtual Services:

- Skype 2019 Director HLB Only - WebSvc HTTP
- Skype 2019 Director HLB Only - WebSvc HTTPS
- Skype 2019 Director HLB Only - SIP

#### 5.2.1.1 Deploy Director HLB Only Template

To add the Virtual Services for Skype Director with the template, follow the steps below:

1. Click the **Add New** button.

Please Specify the Parameters for the Virtual Service.

Virtual Address	<input type="text" value="10.10.99.50"/>
Port	<input type="text" value="80"/>
Service Name (Optional)	<input type="text" value="Skype 2019 Director"/>
Use Template	<input type="text" value="Skype 2019 Director HLB Only"/>
Protocol	<input type="text" value="tcp"/>

2. Enter a **Virtual Address**.

3. Select the **Skype 2019 Director HLB Only** template in the **Use Template** drop-down list.

4. Click **Add This Virtual Service**.

#### 5.2.1.2 Configure Director HLB WebSvc HTTP Virtual Service

To configure the Skype 2019 Director HLB Only - WebSvc HTTP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.50:80	tcp	Skype 2019 Director HLB Only - WebSvc HTTP	L7		Down		Modify Delete
10.10.99.50:443(*1)	tcp	Skype 2019 Director HLB Only - WebSvc HTTPS	L7	on Real Server	Down		Modify Delete
10.10.99.50:5061	tcp	Skype 2019 Director HLB Only - SIP	L7		Down		Modify Delete

2. Click **Modify** on the **Skype 2019 Director HLB Only - WebSvc HTTP** Virtual Service.

3. Expand the **Real Servers** section.

4. Click **Add New**.

5. Enter the **Real Server Address**.

6. Confirm that **Port 80** is entered.

7. Click **Add This Real Server**.

8. Add additional Real Servers as needed.

##### 5.2.1.2.1 Director HLB WebSvc HTTP Virtual Service Recommended API Settings (Optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	80
prot	tcp
ForceL7	1
Transparent	0
Persist	src
PersistTimeout	1200
Schedule	lc

API Parameter	API Value
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	5061

### 5.2.1.3 Configure Director HLB WebSvc HTTPS Virtual Service

To configure the Skype 2019 Director HLB Only - WebSvc HTTPS Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.50:80	tcp	Skype 2019 Director HLB Only - WebSvc HTTP	L7		Down		Modify   Delete
10.10.99.50:443(+1)	tcp	Skype 2019 Director HLB Only - WebSvc HTTPS	L7	on Real Server	Down		Modify   Delete
10.10.99.50:5061	tcp	Skype 2019 Director HLB Only - SIP	L7		Down		Modify   Delete

2. Click **Modify** on the **Skype 2019 Director HLB Only - WebSvc HTTPS** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 443** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.2.1.3.1 Director HLB WebSvc HTTPS Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp

API Parameter	API Value
ForceL7	1
Transparent	0
ExtraPorts	444
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	5061

#### 5.2.1.4 Configure Director HLB SIP Virtual Service

To configure the Skype 2019 Director HLB Only - SIP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.50:80	tcp	Skype 2019 Director HLB Only - WebSvc HTTP	L7		Down		Modify Delete
10.10.99.50:443(+1)	tcp	Skype 2019 Director HLB Only - WebSvc HTTPS	L7	on Real Server	Down		Modify Delete
10.10.99.50:5061	tcp	Skype 2019 Director HLB Only - SIP	L7		Down		Modify Delete

2. Click **Modify** on the **Skype 2019 Director HLB Only - SIP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 5061** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.2.1.4.1 Director HLB SIP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	5061
prot	tcp
VStype	gen
ForceL7	1
Transparent	0
ServerInit	0
Persist	src
PersistTimeout	1200
Schedule	lc
Idletime	1800
UseforSnat	1
CheckType	tcp
CheckPort	5061

### 5.2.2 Front End HLB Only

The Skype Front End HLB Only template contains four Virtual Services:

- Skype 2019 Front End HLB Only - WebSvc HTTP
- Skype 2019 Front End HLB Only - WebSvc HTTPS
- Skype 2019 Front End HLB Only - SIP
- Skype 2019 Front End HLB Only - DCOM

#### 5.2.2.1 Deploy Front End HLB Only Template

To add the Virtual Services for Skype Front End with the template, follow the steps below:

1. Click the **Add New** button.

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

---

Virtual Address

Port

Service Name (Optional)

Use Template

Protocol

2. Enter a **Virtual Address**.
3. Select **Skype 2019 Front End HLB Only** in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.

#### 5.2.2.2 Configure Front End HLB WebSvc HTTP Virtual Service

To configure the Skype 2019 Front End HLB Only - WebSvc HTTP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.51:80	tcp	Skype 2019 Front End HLB Only - WebSvc HTTP	L7		<span style="color: red;">✘</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:135	tcp	Skype 2019 Front End HLB Only - DCOM	L7		<span style="color: red;">✘</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:443(+1)	tcp	Skype 2019 Front End HLB Only - WebSvc HTTPS	L7	on Real Server	<span style="color: red;">✘</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:5061(+8)	tcp	Skype 2019 Front End HLB Only - SIP	L7		<span style="color: red;">✘</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Front End HLB Only - WebSvc HTTP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 80** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

## 5.2.2.2.1 Front End HLB WebSvc HTTP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	80
prot	tcp
ForceL7	1
Transparent	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
IdleTime	1800
CheckType	tcp
CheckPort	5061

## 5.2.2.3 Configure Front End HLB WebSvc HTTPS Virtual Service

To configure the Skype 2019 Front End HLB Only - WebSvc HTTPS Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.51:80	tcp	Skype 2019 Front End HLB Only - WebSvc HTTP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:135	tcp	Skype 2019 Front End HLB Only - DCOM	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:443(+1)	tcp	Skype 2019 Front End HLB Only - WebSvc HTTPS	L7	on Real Server	⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:5061(+8)	tcp	Skype 2019 Front End HLB Only - SIP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Front End HLB Only - WebSvc HTTPS** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.



5. Enter the **Real Server Address**.
6. Confirm that **Port 443** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.2.2.3.1 Front End HLB WebSvc HTTPS Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
ForceL7	1
Transparent	0
ExtraPorts	444
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
IdleTime	1800
CheckType	tcp
CheckPort	5061

#### 5.2.2.4 Configure Front End HLB DCOM Virtual Service

To configure the Skype 2019 Front End HLB Only - DCOM Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.51:80	tcp	Skype 2019 Front End HLB Only - WebSvc HTTP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:135	tcp	Skype 2019 Front End HLB Only - DCOM	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:443(+1)	tcp	Skype 2019 Front End HLB Only - WebSvc HTTPS	L7	on Real Server	⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:5061(+8)	tcp	Skype 2019 Front End HLB Only - SIP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>

- Click **Modify** on the **Skype 2019 Front End HLB Only - DCOM** Virtual Service.
- Expand the **Real Servers** section.
- Click **Add New**.
- Enter the **Real Server Address**.
- Confirm that **Port 135** is entered.
- Click **Add This Real Server**.
- Add additional Real Servers as needed.

#### 5.2.2.4.1 Front End HLB DCOM Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	135
prot	tcp
ForceL7	1
Transparent	0
ServerInit	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
IdleTime	1800

API Parameter	API Value
CheckType	tcp
CheckPort	5061

#### 5.2.2.5 Configure Front End HLB SIP Virtual Service

To configure the Skype 2019 Front End HLB Only - SIP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.51:80	tcp	Skype 2019 Front End HLB Only - WebSvc HTTP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:135	tcp	Skype 2019 Front End HLB Only - DCOM	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:443(+1)	tcp	Skype 2019 Front End HLB Only - WebSvc HTTPS	L7	on Real Server	⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.51:5061(+8)	tcp	Skype 2019 Front End HLB Only - SIP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Front End HLB Only - SIP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 5061** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

##### 5.2.2.5.1 Front End HLB SIP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	5061
prot	tcp
VStype	gen

API Parameter	API Value
ExtraPorts	448,5070-5073,5075,5076,5080
ServerInit	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
IdleTime	1800
CheckType	tcp
CheckPort	5061

### 5.2.3 Mediation HLB Only Virtual Service

DNS-only load balancing is sufficient for Mediation pools. If using the LoadMaster instead of DNS, load balance only TCP port 5070.

To configure a Virtual Service for Skype 2019 Mediation with the template, follow the steps below:

1. Click the **Add New** button.

Please Specify the Parameters for the Virtual Service.

Virtual Address

10.10.99.52

Port

5070

Service Name (Optional)

Skype 2019 Mediat

Use Template

Skype 2019 Mediation HLB Only

Protocol

tcp

2. Enter a **Virtual Address**.
3. Select **Skype 2019 Mediation HLB Only** in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.
5. Expand the **Real Servers** section.

6. Click **Add New**.
7. Enter the **Real Server Address**.
8. Confirm that **Port 5070** is entered.
9. Click **Add This Real Server**.
10. Add additional Real Servers as needed.

#### 5.2.3.1 Mediation HLB Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	5070
prot	tcp
VStype	gen
ForceL7	1
Transparent	0
ServerInit	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
IdleTime	1800
CheckType	tcp
CheckPort	5070

#### 5.2.4 Edge Internal HLB Only

The Skype Edge Internal HLB Only template contains three Virtual Services:

- Skype 2019 Edge Internal HLB Only - AV Media TCP
- Skype 2019 Edge Internal HLB Only - AV Media UDP
- Skype 2019 Edge Internal HLB Only - SIP

#### 5.2.4.1 Deploy Edge Internal HLB Template

To add the Virtual Services for Skype for Business Edge Internal with Template, follow the steps below:

1. Click the **Add New** button.

Please Specify the Parameters for the Virtual Service.

Virtual Address

10.10.99.53

Port

443

Service Name (Optional)

Skype 2019 Edge Ir

Use Template

Skype 2019 Edge Internal HLB Only

Protocol

tcp

2. Enter a **Virtual Address**.
3. Select the **Skype 2019 Edge Internal HLB Only** template in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.

#### 5.2.4.2 Configure Edge Internal HLB AV Media TCP Virtual Service

To configure the Skype 2019 Edge Internal HLB Only - AV Media TCP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.53:443	tcp	Skype 2019 Edge Internal HLB Only - AV Media TCP	L7	on Real Server	⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.53:3478	udp	Skype 2019 Edge Internal HLB Only - AV Media UDP	L4		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.53:5061(+1)	tcp	Skype 2019 Edge Internal HLB Only - SIP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Edge Internal HLB Only - AV Media TCP** Virtual Service.

3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 443** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.2.4.2.1 Edge Internal HLB AV Media TCP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
VStype	gen
ForceL7	1
Transparent	0
ServerInit	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	5061

#### 5.2.4.3 Configure Edge Internal HLB AV Media UDP Virtual Service

To configure the Skype 2019 Edge Internal HLB Only - AV Media UDP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.53:443	tcp	Skype 2019 Edge Internal HLB Only - AV Media TCP	L7	on Real Server	⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.53:3478	udp	Skype 2019 Edge Internal HLB Only - AV Media UDP	L4		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.53:5061(+1)	tcp	Skype 2019 Edge Internal HLB Only - SIP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Edge Internal HLB Only - AV Media UDP** Virtual Service.
3. Expand **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 3478** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

##### 5.2.4.3.1 Edge Internal HLB AV Media UDP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	3478
prot	udp
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
CheckType	icmp



#### 5.2.4.4 Configure Edge Internal HLB SIP Virtual Service

To configure the Skype 2019 Edge Internal HLB Only - SIP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.53:443	tcp	Skype 2019 Edge Internal HLB Only - AV Media TCP	L7	on Real Server	⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.53:3478	udp	Skype 2019 Edge Internal HLB Only - AV Media UDP	L4		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>
10.10.99.53:5061(+1)	tcp	Skype 2019 Edge Internal HLB Only - SIP	L7		⊗ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Edge Internal HLB Only - SIP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**
5. Enter the **Real Server Address**.
6. Confirm that **Port 5061** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

##### 5.2.4.4.1 Edge Internal HLB SIP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	5061
prot	tcp
VStype	gen
Transparent	0
ExtraPorts	5062
ServerInit	0
Persist	src
PersistTimeout	1200

API Parameter	API Value
Schedule	lc
IdleTime	1800
UseforSnat	1
CheckType	tcp
CheckPort	5061

Port 5062 is used by any Front End (FE) pool and Survivable Branch Appliance (SBA).

## 5.3 Configure External Edge Virtual Services

To configure the various Edge Virtual Services with Templates, refer to the sections below.

When load balancing external interfaces of Edge pools, the shared interface IP should be used as the default gateway on all Edge interfaces. Also, a publicly routable IP with no NAT or port translation must be used.

### 5.3.1 Edge External HLB Only

The Skype 2019 Edge External HLB Only template contains two Virtual Services:

- Skype 2019 Edge External HLB Only - SIP
- Skype 2019 Edge External HLB Only - SIP Federation

#### 5.3.1.1 Deploy Edge External HLB Template

To add the Virtual Services for Skype 2019 Edge External HLB Only with the template, follow the steps below:

1. Click the **Add New** button.

Please Specify the Parameters for the Virtual Service.

Virtual Address	<input type="text" value="52.66.101.65"/>
Port	<input type="text" value="5269"/>
Service Name (Optional)	<input type="text" value="Skype 2019 Edge E"/>
Use Template	<input type="text" value="Skype 2019 Edge External HLB Only"/>
Protocol	<input type="text" value="tcp"/>

2. Enter a **Virtual Address**.
3. Select the **Skype 2019 Edge External HLB Only** template in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.

### 5.3.1.2 Configure Edge External HLB SIP Virtual Service

To configure the SfB Edge External SIP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate	Installed	Status	Real Servers	Operation
52.66.101.65:443	tcp	Skype 2019 Edge External HLB Only - SIP	L7	on Real Server		⌵ Down		Modify Delete
52.66.101.65:5061	tcp	Skype 2019 Edge External HLB Only - SIP Federation	L7			⌵ Down		Modify Delete

2. Click **Modify** on the **Skype 2019 Edge External SIP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 443** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.3.1.2.1 Edge External HLB SIP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
ForceL7	1
Transparent	0

API Parameter	API Value
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
IdleTime	1800
CheckType	tcp
CheckPort	5061

### 5.3.1.3 Configure Edge External HLB SIP Federation Virtual Service

To configure the Skype 2019 Edge External HLB Only - SIP Federation Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
52.66.101.65:443	tcp	Skype 2019 Edge External HLB Only - SIP	L7	on Real Server	⊗ Down		Modify   Delete
52.66.101.65:5061	tcp	Skype 2019 Edge External HLB Only - SIP Federation	L7		⊗ Down		Modify   Delete

2. Click **Modify** on the **Skype 2019 Edge External HLB Only - SIP Federation** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 5061** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.3.1.3.1 Edge External HLB SIP Federation Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	5061
prot	tcp
ForceL7	1
Transparent	0
Persist	src
PersistTimeout	1200
Schedule	lc
Idletime	1800
CheckType	tcp
CheckPort	5061

### 5.3.2 Edge External Conferencing

To configure a Virtual Service for Skype 2019 Edge External Conferencing with the template, follow the steps below:

1. Click the **Add New** button.

Please Specify the Parameters for the Virtual Service.

Virtual Address	<input type="text" value="52.66.101.66"/>
Port	<input type="text" value="443"/>
Service Name (Optional)	<input type="text" value="Skype 2019 Edge E"/>
Use Template	<input type="text" value="Skype 2019 Edge External Conferencing"/> ▼
Protocol	<input type="text" value="tcp"/> ▼

2. Enter a **Virtual Address**.
3. Select the **Skype 2019 Edge External Conferencing** template in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.

5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Enter the **Real Server Address**.
8. Confirm that **Port 443** is entered.
9. Click **Add This Real Server**.
10. Add additional Real Servers as needed.

#### 5.3.2.1 Edge External HLB Conferencing Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
ForceL7	1
Transparent	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
IdleTime	1800
CheckType	tcp
CheckPort	443

#### 5.3.3 Edge External AV HLB Only

The Skype Edge External AV HLB Only template contains two Virtual Services:

- Skype 2019 Edge External AV HLB Only - Media TCP
- Skype 2019 Edge External AV HLB Only - Media UDP

### 5.3.3.1 Deploy Edge External AV HLB Template

To add the Virtual Services for Skype Edge External AV with the template, follow the steps below:

1. Click the **Add New** button.

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

---

Virtual Address

52.66.101.67

Port

443

Service Name (Optional)

Skype 2019 Edge Ex

Use Template

Skype 2019 Edge External AV HLB Only ▾

Protocol

tcp ▾

2. Enter a **Virtual Address**.
3. Select the **Skype 2019 Edge External AV HLB Only** template in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.

### 5.3.3.2 Configure Edge External HLB AV Media TCP Virtual Service

To configure the Skype 2019 Edge External AV HLB Only - Media TCP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
52.66.101.67:443	tcp	Skype 2019 Edge External AV HLB Only - Media TCP	L7	on Real Server	<span style="color: red;">✖</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>
52.66.101.67:3478	udp	Skype 2019 Edge External AV HLB Only - Media UDP	L4		<span style="color: red;">✖</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Edge External AV HLB Only - Media TCP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.

6. Confirm that **Port 443** is entered.
7. Click **Add This Real Server**.
8. Add additional Real Servers as needed.

#### 5.3.3.2.1 Edge External HLB AV Media TCP Virtual Service Recommended API Settings (optional)



This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
ForceL7	1
Transparent	1
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
IdleTime	1800
CheckType	tcp
CheckPort	443

#### 5.3.3.3 Configure Edge External HLB AV Media UDP Virtual Service

To configure the Skype 2019 Edge External HLB AV Media UDP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
52.66.101.67:443	tcp	Skype 2019 Edge External AV HLB Only - Media TCP	L7	on Real Server	 Down		<a href="#">Modify</a> <a href="#">Delete</a>
52.66.101.67:3478	udp	Skype 2019 Edge External AV HLB Only - Media UDP	L4		 Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Edge External HLB AV Media UDP** Virtual Service.



3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 3478** is entered.
7. Set the **Forwarding Method** to **Direct Return**.
8. Click **Add This Real Server**.
9. Add additional Real Servers as needed.

---

Ensure the **Forwarding Method** is set to **Direct Return** when adding the Real Servers.

---

#### 5.3.3.3.1 Edge External HLB Media UDP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	3478
prot	udp
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
CheckType	icmp

---

Ensure the **Forwarding Method** is set to **Direct Return** when adding the Real Servers.

---

## 5.4 Common to Both with Templates

The Virtual Services listed below are common to both DNS and HLB configurations.

### 5.4.1 Office Online Servers Virtual Service

To configure a Virtual Service for Office Online Servers with the template, follow the steps below:

1. Click the **Add New** button.

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

Virtual Address	<input style="width: 80%;" type="text" value="10.10.99.56"/>
Port	<input style="width: 80%;" type="text" value="443"/>
Service Name (Optional)	<input style="width: 80%;" type="text" value="Skype 2019 Office C"/>
Use Template	<input style="width: 80%;" type="text" value="Skype 2019 Office Online Server"/> ▼
Protocol	<input style="width: 80%;" type="text" value="tcp"/> ▼

2. Enter a **Virtual Address**.
3. Select **Skype Office Online Servers** in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.
5. Expand the **SSL Properties** section.

**SSL Properties**

SSL Acceleration	Enabled: <input checked="" type="checkbox"/> Reencrypt: <input checked="" type="checkbox"/>
Supported Protocols	<input type="checkbox"/> SSLv3 <input checked="" type="checkbox"/> TLS1.0 <input checked="" type="checkbox"/> TLS1.1 <input checked="" type="checkbox"/> TLS1.2
Require SNI hostname	<input type="checkbox"/>
Certificates	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Self Signed Certificate In use.</p> <p>Available Certificates</p> <div style="border: 1px solid #ccc; padding: 2px; min-height: 40px;">None Available</div> </div> <div style="width: 45%;"> <p>Assigned Certificates</p> <div style="border: 1px solid #ccc; padding: 2px; min-height: 40px;">None Assigned</div> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>&gt;</span> <span>&lt;</span> <span style="border: 1px solid #000; padding: 2px 5px;">Set Certificates</span> </div> <div style="text-align: center; margin-top: 5px;"> <span style="border: 1px solid #000; padding: 2px 5px;">Manage Certificates</span> </div>
Ciphers	<p>Cipher Set: <span style="border: 1px solid #000; padding: 2px 5px;">Default</span> <span style="border: 1px solid #000; padding: 2px 5px;">Modify Cipher Set</span></p> <p>Assigned Ciphers</p> <div style="border: 1px solid #ccc; padding: 2px; min-height: 60px;">           ECDHE-RSA-AES256-GCM-SHA384            ECDHE-ECDSA-AES256-GCM-SHA384            ECDHE-RSA-AES256-SHA384            ECDHE-ECDSA-AES256-SHA384            ECDHE-RSA-AES256-SHA            ECDHE-ECDSA-AES256-SHA         </div>
Client Certificates	<span style="border: 1px solid #000; padding: 2px 5px;">No Client Certificates required</span> ▼
Reencryption Client Certificate	<span style="border: 1px solid #000; padding: 2px 5px;">None required</span>
Reencryption SNI Hostname	<span style="border: 1px solid #000; padding: 2px 5px;"></span> <span style="border: 1px solid #000; padding: 2px 5px;">Set SNI Hostname</span>

6. Select a valid certificate that was previously imported and click the **>** button to assign the certificate.
7. Click **Set Certificates**.
8. Expand the **Real Servers** section.

9. Click **Add New**.
10. Enter the **Real Server Address**.
11. Confirm that **Port 443** is entered.
12. Click **Add This Real Server**.
13. Add additional Real Servers as needed.

#### 5.4.1.1 Office Online Servers Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
SSLReencrypt	1
Persist	super-src
PersistTimeout	1800
Schedule	lc
UseforSnat	1
IdleTime	1800
SSLAcceleration	1
SSLReencrypt	1
CheckType	https
CheckURL	/hosting/discovery
CheckUse1.1	1
CheckUseGet	1

#### 5.4.2 Director Reverse Proxy

The Skype 2019 Director Reverse Proxy template contains two Virtual Services:

- Skype 2019 Director Reverse Proxy - HTTP
- Skype 2019 Director Reverse Proxy - HTTPS

#### 5.4.2.1 Deploy Director Reverse Proxy Template

To add the Virtual Services for Skype for Business Director Reverse Proxy with the template, follow the steps below:

1. Click the **Add New** button.

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

Virtual Address

Port

Service Name (Optional)

Use Template  ▼

Protocol  ▼

2. Enter a **Virtual Address**.
3. Select the **Skype 2019 Director Reverse Proxy** template in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.

#### 5.4.2.2 Configure Director Reverse Proxy HTTP Virtual Service

To configure the Skype 2019 Director Reverse Proxy - HTTP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
172.16.10.54:80	tcp	Skype 2019 Director Reverse Proxy - HTTP	L7		<span style="color: red;">✖</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>
172.16.10.54:443	tcp	Skype 2019 Director Reverse Proxy - HTTPS	L7	<a href="#">Add New</a>	<span style="color: red;">✖</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Director Reverse Proxy - HTTP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.

6. Confirm that **Port 8080** is entered.

7. Click **Add This Real Server**.

---

Do not use **80** as the Real Server **port**

---

8. Add additional Real Servers as needed.

#### 5.4.2.2.1 Director Reverse Proxy HTTP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	80
prot	tcp
ForceL7	1
Transparent	0
Persist	none
Schedule	lc
UseforSnat	1
IdleTime	1800
CheckType	tcp
CheckPort	5061

---

Do not use **80** as the Real Server **port**.

---

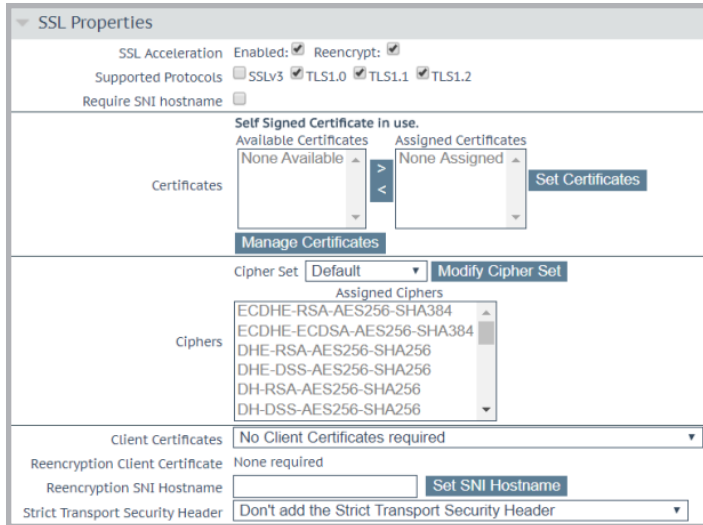
#### 5.4.2.3 Configure Director Reverse Proxy HTTPS Virtual Service

To configure the Skype 2019 Director Reverse Proxy - HTTPS Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
172.16.10.54:80	tcp	Skype 2019 Director Reverse Proxy - HTTP	L7		⛔ Down		<a href="#">Modify</a> <a href="#">Delete</a>
172.16.10.54:443	tcp	Skype 2019 Director Reverse Proxy - HTTPS	L7	<a href="#">Add New</a>	⛔ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Director Reverse Proxy - HTTPS** Virtual Service.
3. Expand the **SSL Properties** section.



The screenshot shows the 'SSL Properties' configuration window. It includes sections for 'Self Signed Certificate in use' with 'Available Certificates' (None Available) and 'Assigned Certificates' (None Assigned), a 'Ciphers' list (ECDHE-RSA-AES256-SHA384, ECDHE-ECDSA-AES256-SHA384, DHE-RSA-AES256-SHA256, DHE-DSS-AES256-SHA256, DH-RSA-AES256-SHA256, DH-DSS-AES256-SHA256), and 'Client Certificates' (No Client Certificates required). There are also buttons for 'Set Certificates', 'Manage Certificates', 'Modify Cipher Set', and 'Set SNI Hostname'.

4. Select a valid certificate that was previously imported and click the > button to assign the certificate.
5. Click **Set Certificates**.
6. Expand the **Real Servers** section.
7. Click **Add New**.
8. Enter the **Real Server Address**.
9. Confirm that **Port 4443** is entered.
10. Click **Add This Real Server**.

---

**Do not use 443 as the Real Server port.**

---

11. Add additional Real Servers as needed.

#### 5.4.2.3.1 Director Reverse Proxy HTTPS Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
Persist	none
Schedule	lc
UseforSnat	1
IdleTime	1800
SSLAcceleration	1
SSLReencrypt	1
CheckType	tcp
CheckPort	5061

Do not use port 443 as the Real Server port.

### 5.4.3 Front End Reverse Proxy

The Skype for Business 2019 Front End Reverse Proxy template contains two Virtual Services:

- Skype 2019 Front End Reverse Proxy - HTTP
- Skype 2019 Front End Reverse Proxy - HTTPS

#### 5.4.3.1 Deploy Front End Reverse Proxy Template

To add the Virtual Services for Skype Front End Reverse Proxy with the template, follow the steps below:

1. Click the **Add New** button.

Please Specify the Parameters for the Virtual Service.

Virtual Address	<input type="text" value="172.16.10.55"/>
Port	<input type="text" value="80"/>
Service Name (Optional)	<input type="text" value="Skype 2019 Front E"/>
Use Template	<input type="text" value="Skype 2019 Front End Reverse Proxy"/>
Protocol	<input type="text" value="tcp"/>

2. Enter a **Virtual Address**.
3. Select the **Skype 2019 For Business 2019 Front End Reverse Proxy** template in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.

#### 5.4.3.2 Configure Front End Reverse Proxy HTTP Virtual Service

To configure the Skype 2019 Front End Reverse Proxy - HTTP Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
172.16.10.55:80	tcp	Skype 2019 Front End Reverse Proxy - HTTP	L7		<span>⌵</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>
172.16.10.55:443	tcp	Skype 2019 Front End Reverse Proxy - HTTPS	L7	<a href="#">Add New</a>	<span>⌵</span> Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Front End Reverse Proxy - HTTP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port8080** is entered.
7. Click **Add This Real Server**.

Do not use port 80 as the Real Server port.

8. Add additional Real Servers as needed.



## 5.4.3.2.1 Front End Reverse Proxy HTTP Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	80
prot	tcp
ForceL7	1
Transparent	0
Persist	none
Schedule	lc
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	5061

Ensure to not use port 80 as the Real Server Port.

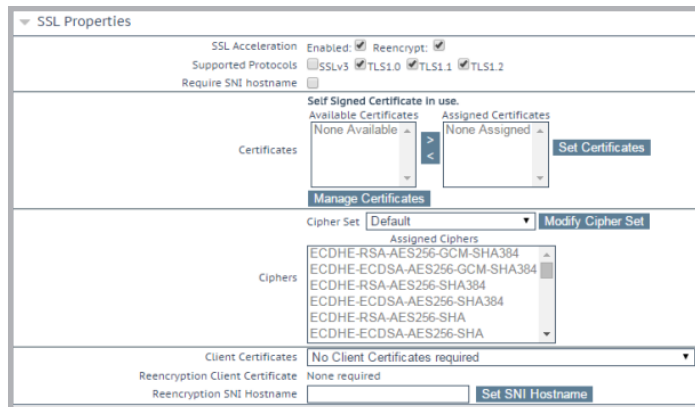
## 5.4.3.3 Configure Front End Reverse Proxy HTTPS Virtual Service

To configure the Skype 2019 Front End Reverse Proxy - HTTPS Virtual Service, follow the steps below:

1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
172.16.10.55:80	tcp	Skype 2019 Front End Reverse Proxy - HTTP	L7		⛔ Down		<a href="#">Modify</a> <a href="#">Delete</a>
172.16.10.55:443	tcp	Skype 2019 Front End Reverse Proxy - HTTPS	L7	<a href="#">Add New</a>	⛔ Down		<a href="#">Modify</a> <a href="#">Delete</a>

2. Click **Modify** on the **Skype 2019 Front End Reverse Proxy - HTTPS** Virtual Service.
3. Expand the **SSL Properties** section.



4. Select a valid certificate that was previously imported and click the > button to assign the certificate.
5. Click **Set Certificates**.
6. Expand the **Real Servers** section.
7. Click **Add New**.
8. Enter the **Real Server Address**.
9. Confirm that **Port 4443** is entered.
10. Click **Add This Real Server**.

---

Do not use port 443 as the Real Server port.

---

11. Add additional Real Servers as needed.

#### 5.4.3.3.1 Front End Reverse Proxy HTTPS Virtual Service Recommended API Settings (optional)

This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
Persist	none
Schedule	lc

API Parameter	API Value
UseforSnat	1
IdleTime	1800
SSLAcceleration	1
SSLReencrypt	1
CheckType	tcp
CheckPort	5061

Do not use port 443 as the Real Server port.

# 6 Additional Information

Some additional information that may be of use is contained within the sections below.

## 6.1 Server Maintenance

When blocking traffic to a server during maintenance, removing the server IP entry from the pool Fully Qualified Domain Name (FQDN) is not sufficient. The server entry must be removed from the DNS. As the server to server traffic is topology-aware, in order to block server to server traffic the server must be removed from the DNS topology.

## 6.2 Loss of Failover while using DNS

Loss of failover when load balancing Edge pools using DNS is possible in the following scenarios:

- Federation with organizations running Office Communications Server (OCS) versions older than Lync 2010
- Privileged Identity Management (PIM) connectivity with Skype, Windows Live, AOL, Yahoo!, and XMPP partners
- Unified Messaging (UM) Play on Phone functionality
- Transferring calls from UM Auto Attendant

## 6.3 Hardware Load Balancing

If hardware load balancing is being used, a list of the ports that must be open can be found here:

<http://technet.microsoft.com/en-us/library/gg398833.aspx>

Hardware load balancing Edge servers requires  $N+1$  Public IP addresses.

Refer to the link below for further information on hardware load balancing:

<https://technet.microsoft.com/en-us/library/gg615011.aspx>

# 7 References

The following sources are referred to in this document:

**Kemp website**

[www.kemptechnologies.com](http://www.kemptechnologies.com)

**Kemp Documentation page**

<http://kemptechnologies.com/documentation>

**Web User Interface (WUI), Configuration Guide**

<http://kemptechnologies.com/documentation>

**Virtual Services and Templates, Feature Description**

<http://kemptechnologies.com/documentation>

**Ports and Protocols for Internal Servers**

<https://docs.microsoft.com/en-us/skypeforbusiness/plan-your-deployment/network-requirements/ports-and-protocols>

**Edge Deployments**

<https://docs.microsoft.com/en-us/skypeforbusiness/plan-your-deployment/edge-server-deployments/edge-environmental-requirements>

# Last Updated Date

This document was last updated on 27 July 2023.