

MS Skype For Business 2019

Deployment Guide

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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.

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

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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)

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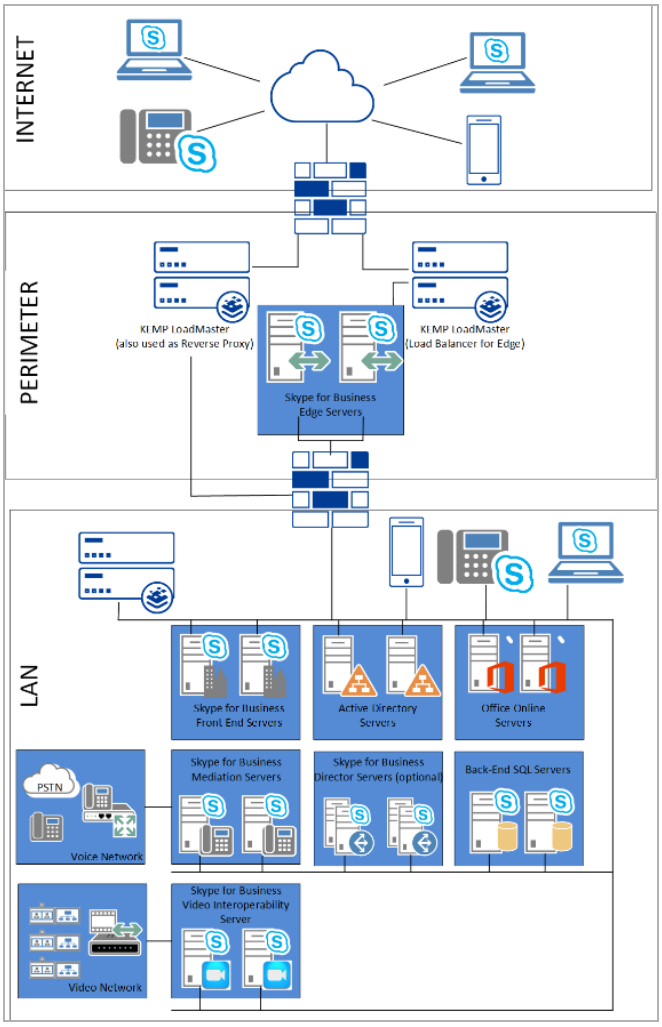
2 Load Balancing Microsoft Skype for Business 2019



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.

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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.

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3 Template

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

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

Download released templates from the following page: LoadMaster Templates.

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

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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.

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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.

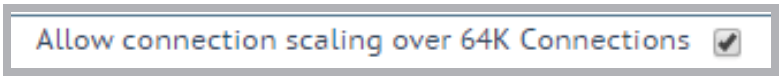
L7 Transparency must be disabled to use connection scaling.

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**.

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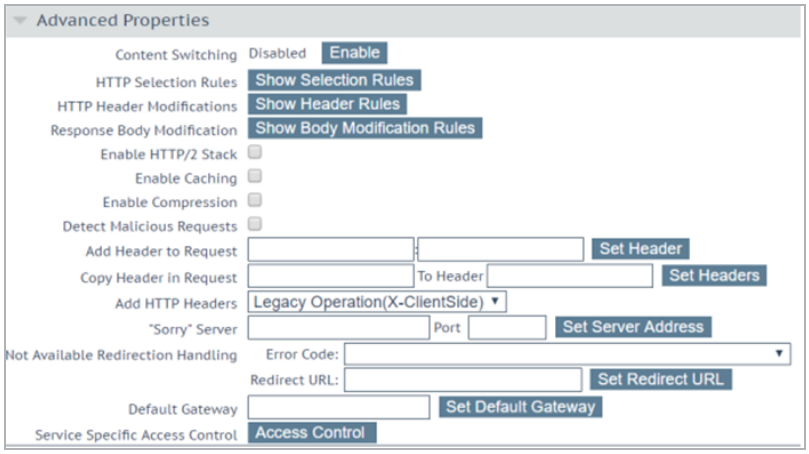
6. Click **View/Modify Services**.

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.

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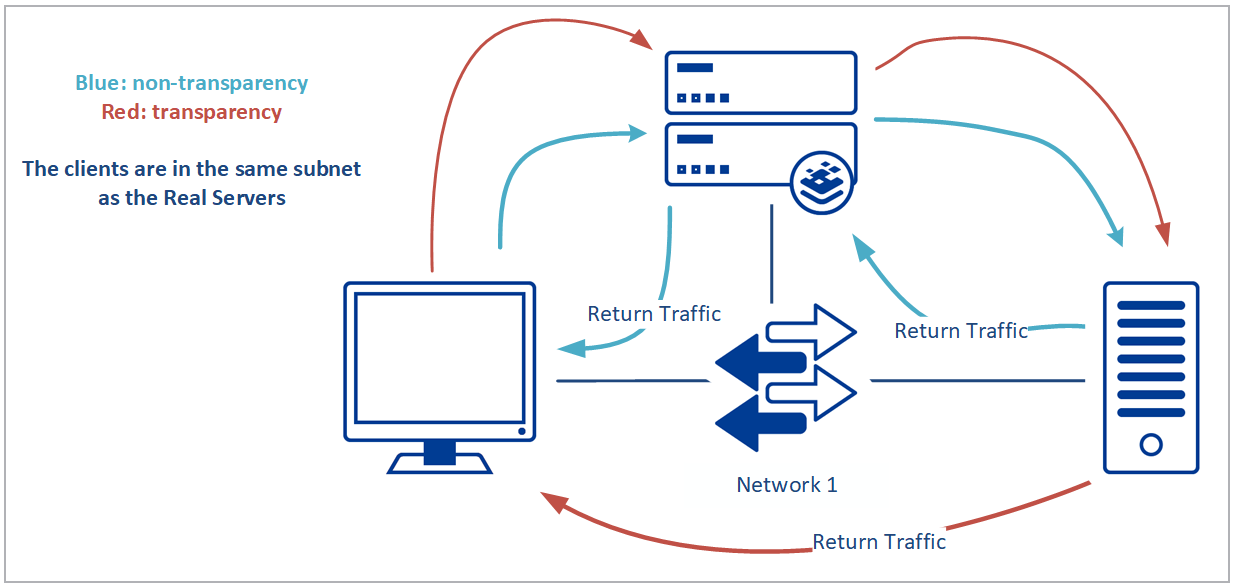
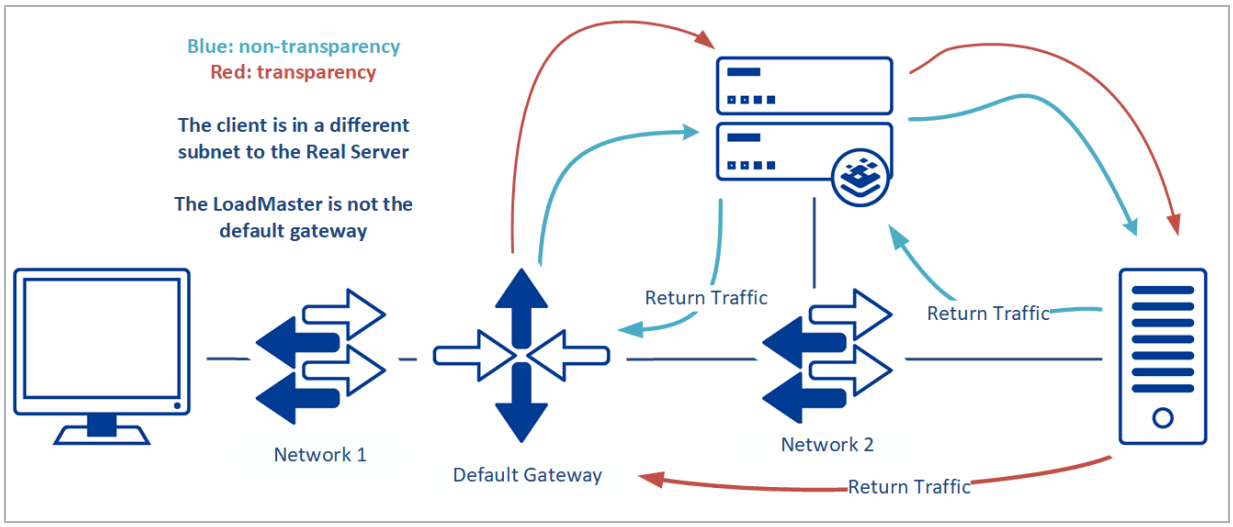


If the Real Servers' default gateway is not set to be the LoadMaster's interface (the shared IP if the LoadMasters are in HA), traffic returning to the LoadMaster is instead sent to the gateway. This is asymmetric routing and causes the connection to drop because the connection should be sent from the 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.

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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 Real Server sees traffic originating from 10.20.20.21 (LoadMaster eth1 address) and responds correctly in most scenarios.

With **Subnet Originating Requests** disabled, the Real Server sees traffic originating from 10.0.0.15 (LoadMaster Virtual Service address on **eth0**) and responds to **eth0** which could cause asymmetric routing.

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 User Interface (UI), go to **System Configuration > Miscellaneous Options > Network Options**.
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**.
2. Click the **Always Check Persist** drop-down arrow and select **Yes – Accept Changes**.

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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

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- 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

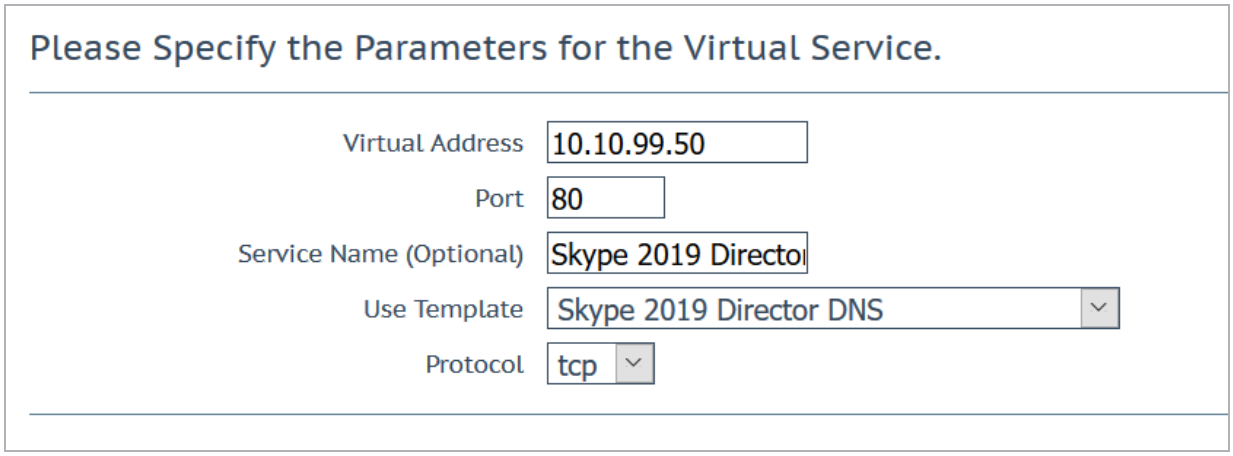
The Skype Director DNS template contains two Virtual Services:

- 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.



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.

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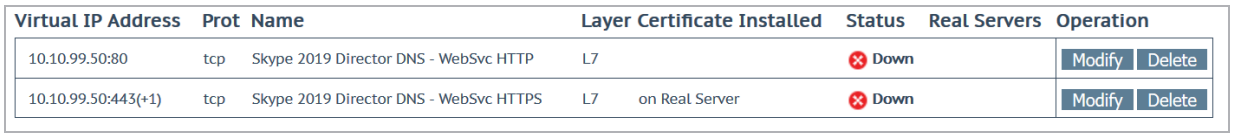

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.50:80	tcp	Skype 2019 Director DNS - WebSvc HTTP	L7		Down		Modify Delete
10.10.99.50:443(+1)	tcp	Skype 2019 Director DNS - WebSvc HTTPS	L7	on Real Server	Down		Modify Delete

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

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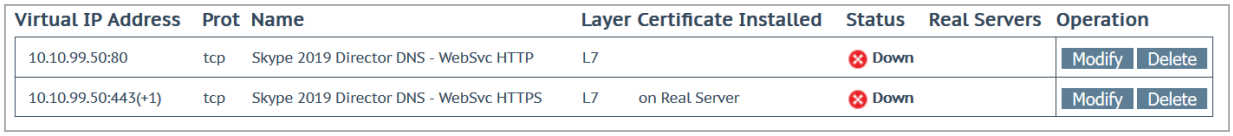
5.1.1.3 Configure Director DNS WebSvc HTTPS Virtual Service

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.



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

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

5.1.2 Front End DNS

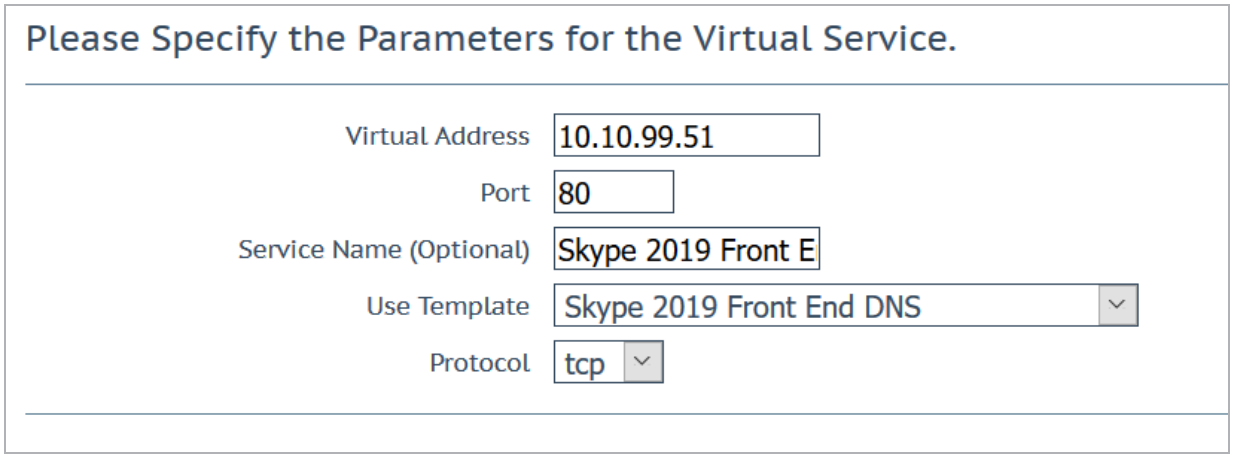
The Skype Front End DNS template contains two Virtual Services:

- 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.



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

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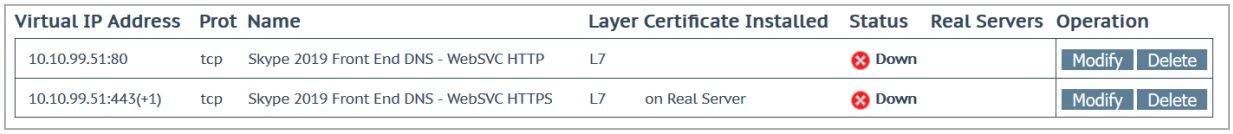
5.1.2.2 Configure Front End DNS WebSvc HTTP Virtual Service

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.



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

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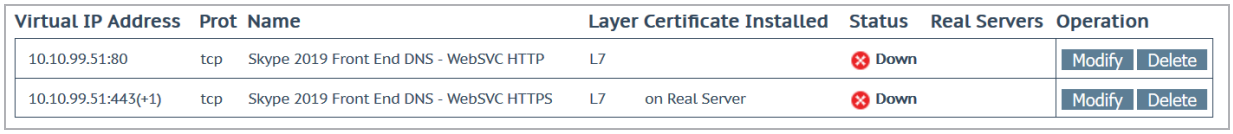
API Parameter	API Value
Idletime	1800
CheckType	tcp
CheckPort	5061

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.



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

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API Parameter	API Value
ExtraPorts	444
Persist	src
PersistTimeout	1200
Schedule	lc
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.

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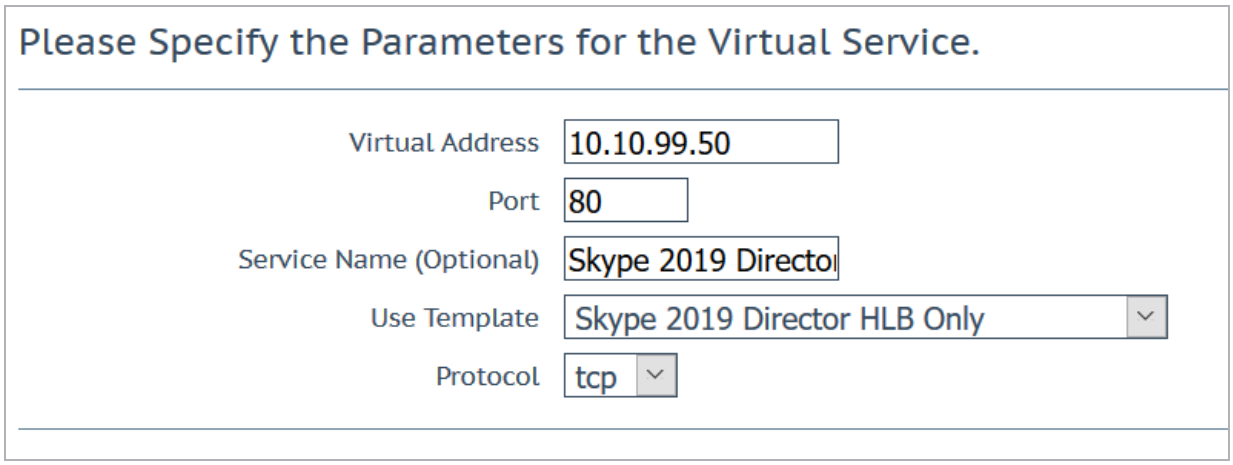


2. Enter a **Virtual Address**.

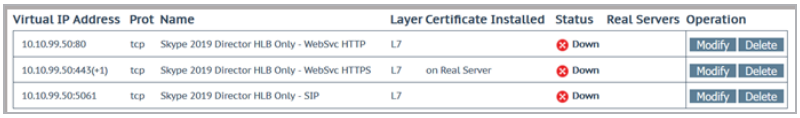
3. Select the **Skype 2019 Director HLB Only** template in the **Use Template** drop-down list.

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.

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

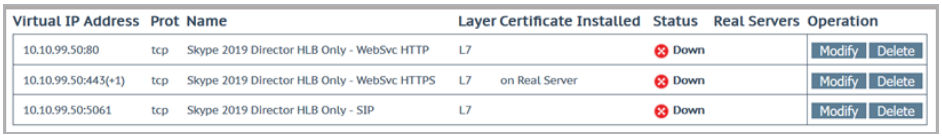
This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

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



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.

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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)

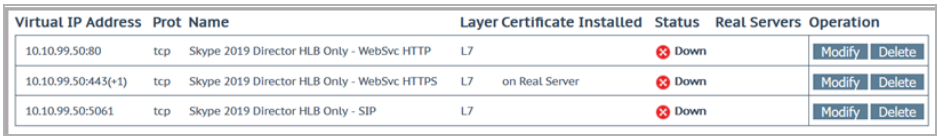
This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

API Parameter	API Value
port	443
prot	tcp
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.



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

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

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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:

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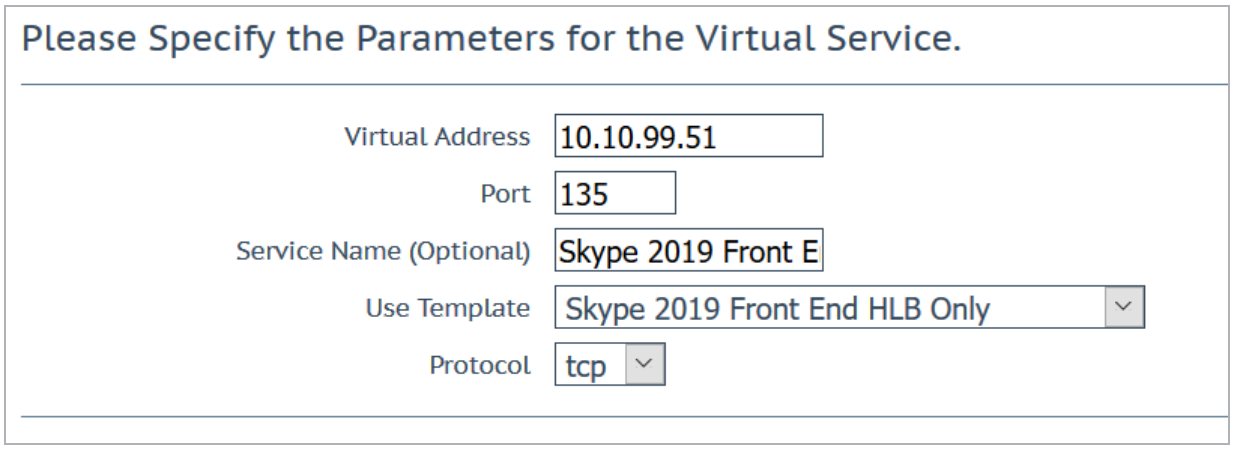
- Skype 2019 Front End HLB Only - WebSvc HTTP
- Skype 2019 Front End HLB Only - WebSvc HTTPS
- Skype 2019 Front End HLB Only - SIP
- Skype 2019 Front End HLB Only - DCOM

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.



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		Down		Modify Delete
10.10.99.51:135	tcp	Skype 2019 Front End HLB Only - DCOM	L7		Down		Modify Delete
10.10.99.51:443(+1)	tcp	Skype 2019 Front End HLB Only - WebSvc HTTPS	L7	on Real Server	Down		Modify Delete
10.10.99.51:5061(+8)	tcp	Skype 2019 Front End HLB Only - SIP	L7		Down		Modify Delete

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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.

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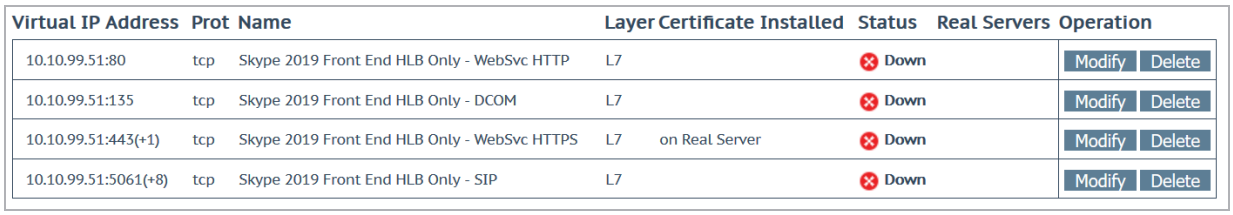

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.99.51:80	tcp	Skype 2019 Front End HLB Only - WebSvc HTTP	L7		Down		Modify Delete
10.10.99.51:135	tcp	Skype 2019 Front End HLB Only - DCOM	L7		Down		Modify Delete
10.10.99.51:443(+1)	tcp	Skype 2019 Front End HLB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

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

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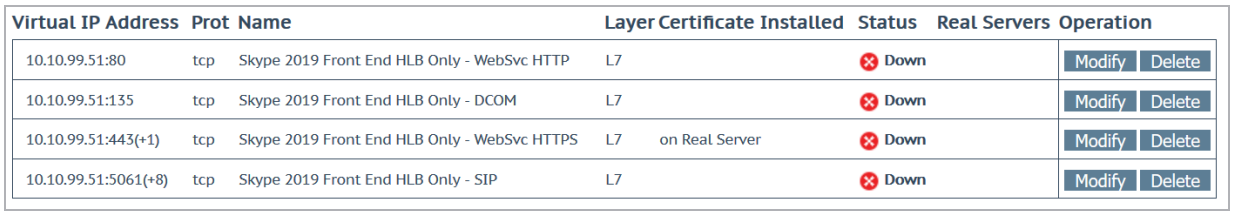
API Parameter	API Value
CheckType	tcp
CheckPort	5061

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.



2. Click **Modify** on the **Skype 2019 Front End HLB Only - DCOM** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Enter the **Real Server Address**.
6. Confirm that **Port 135** is entered.
7. Click **Add This Real Server**.
8. 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

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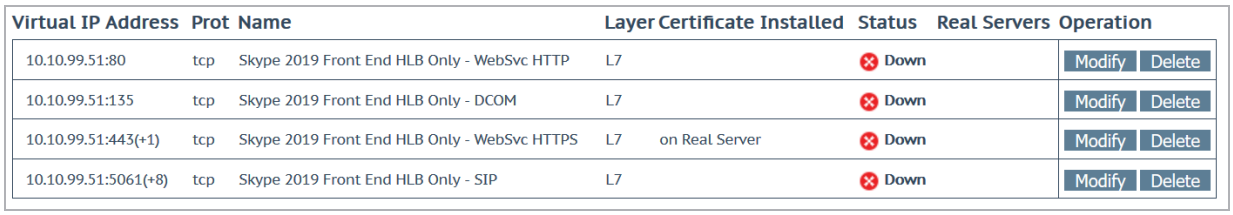
API Parameter	API Value
Transparent	0
ServerInit	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	5061

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		Modify Delete
10.10.99.51:135	tcp	Skype 2019 Front End HLB Only - DCOM	L7		Down		Modify Delete
10.10.99.51:443(+1)	tcp	Skype 2019 Front End HLB Only - WebSvc HTTPS	L7	on Real Server	Down		Modify Delete
10.10.99.51:5061(+8)	tcp	Skype 2019 Front End HLB Only - SIP	L7		Down		Modify Delete

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.

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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
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.

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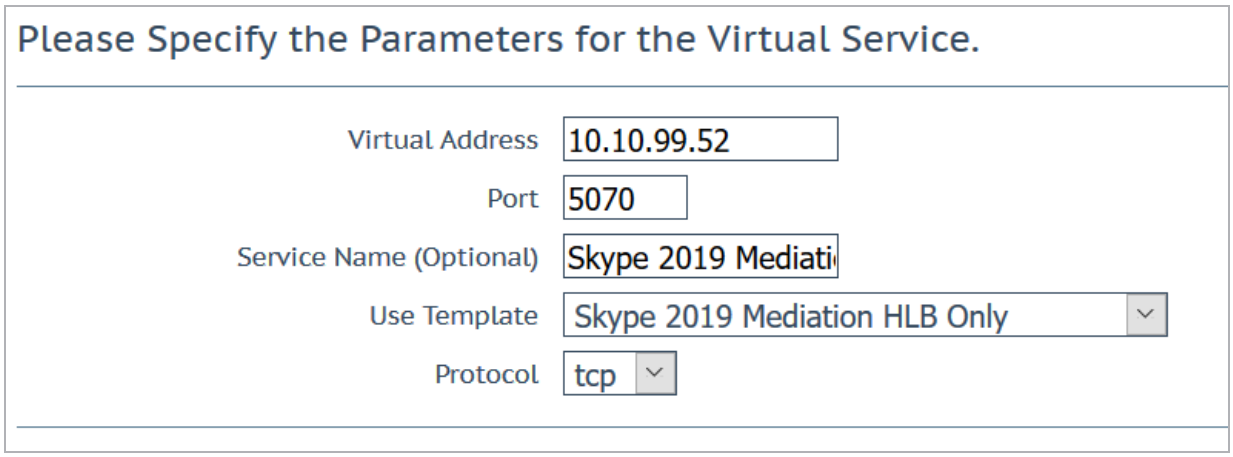

2. Enter a **Virtual Address**.
3. Select **Skype 2019 Mediation HLB Only** in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Enter the **Real Server Address**.
8. Confirm that **Port 5070** is entered.
9. Click **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

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API Parameter	API Value
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.

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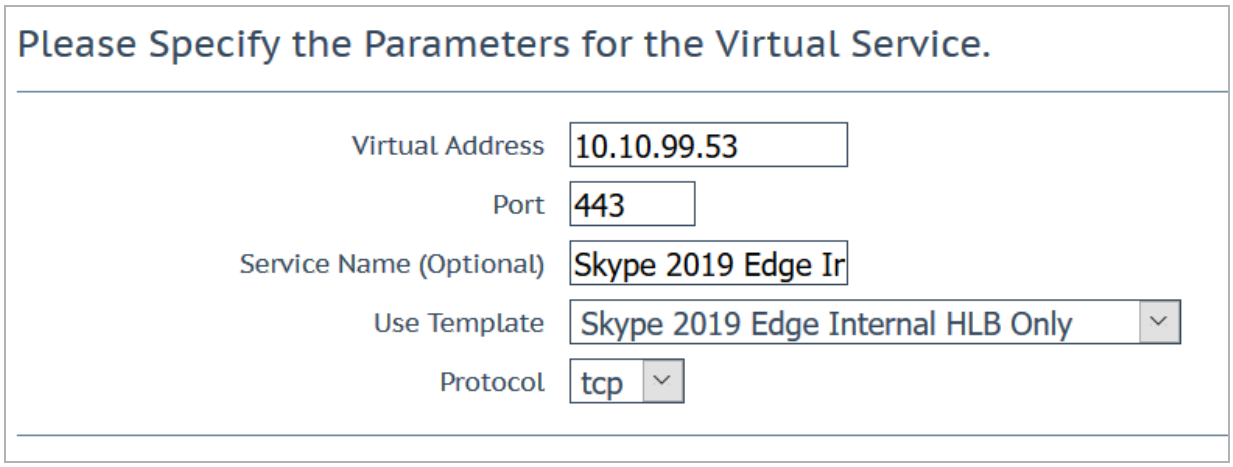


2. Enter a **Virtual Address**.

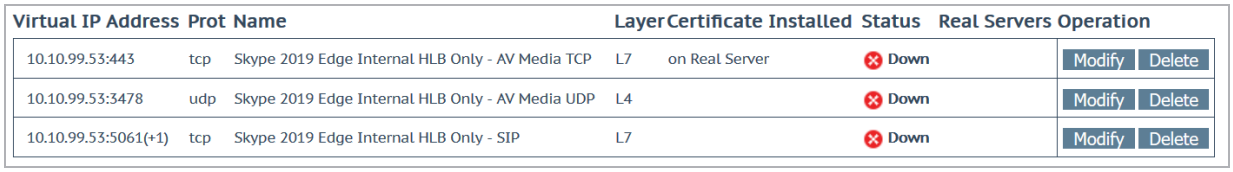
3. Select the **Skype 2019 Edge Internal HLB Only** template in the **Use Template** drop-down list.

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		Modify Delete
10.10.99.53:3478	udp	Skype 2019 Edge Internal HLB Only - AV Media UDP	L4		Down		Modify Delete
10.10.99.53:5061(+1)	tcp	Skype 2019 Edge Internal HLB Only - SIP	L7		Down		Modify Delete

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.

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

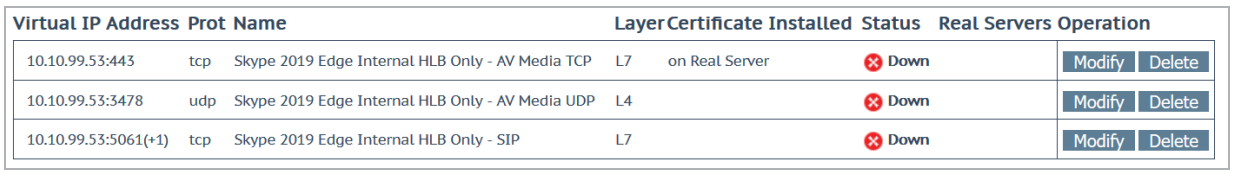
This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

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.



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

3. Expand **Real Servers** section.

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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)

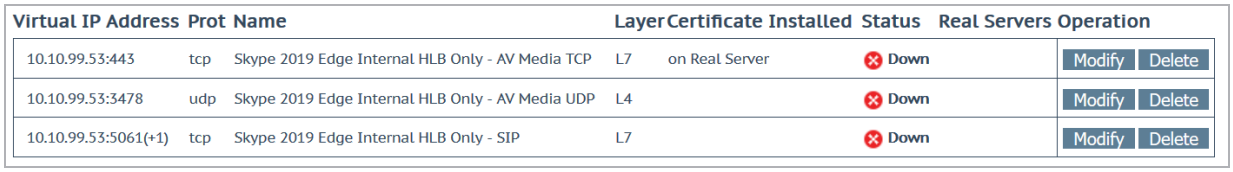
This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

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.



2. Click **Modify** on the **Skype 2019 Edge Internal HLB Only - SIP** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**

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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
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.

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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

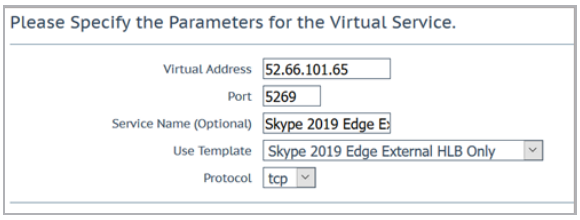
The Skype 2019 Edge External HLB Only template contains two Virtual Services:

- 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.



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.

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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)

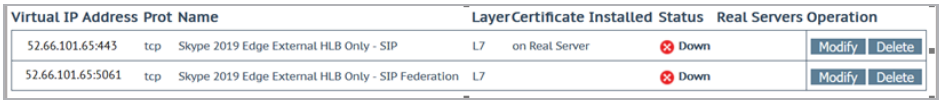
This table outlines the API parameters and values set using the Kemp application template. These settings can be used with scripts and automation tools.

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



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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.

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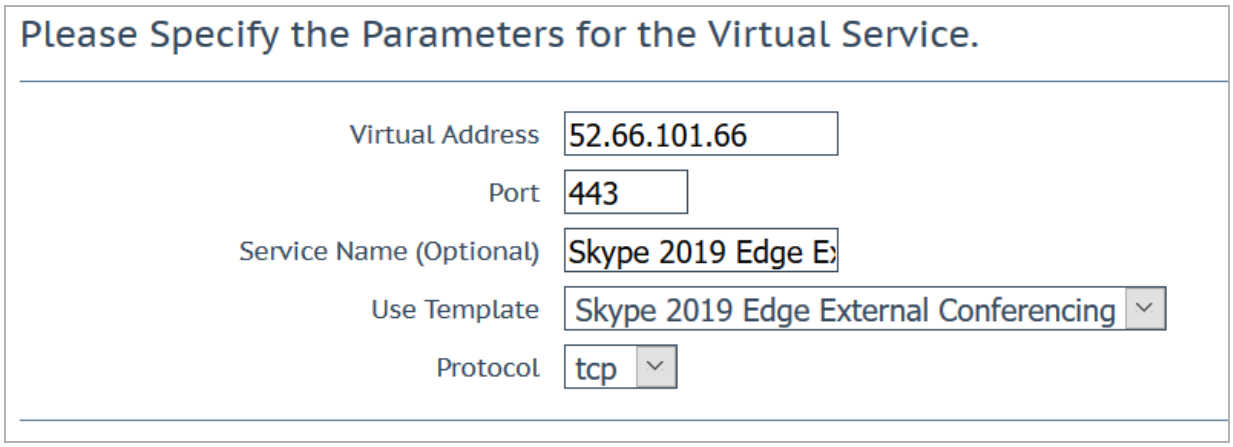

2. Enter a **Virtual Address**.

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

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API Parameter	API Value
Transparent	0
Persist	src
PersistTimeout	1200
Schedule	lc
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	443

5.3.3 Edge External AV HLB Only

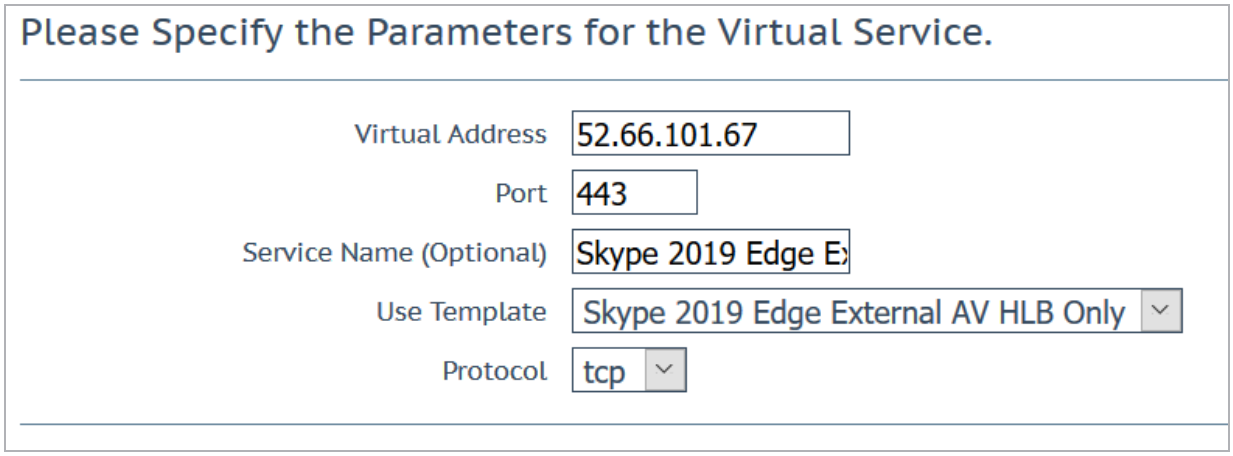
The Skype Edge External AV HLB Only template contains two Virtual Services:

- 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.



2. Enter a **Virtual Address**.

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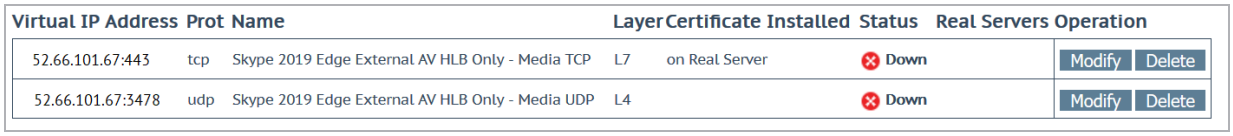
3. Select the **Skype 2019 Edge External AV HLB Only** template in the **Use Template** drop-down list.

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	Down		Modify Delete
52.66.101.67:3478	udp	Skype 2019 Edge External AV HLB Only - Media UDP	L4		Down		Modify Delete

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

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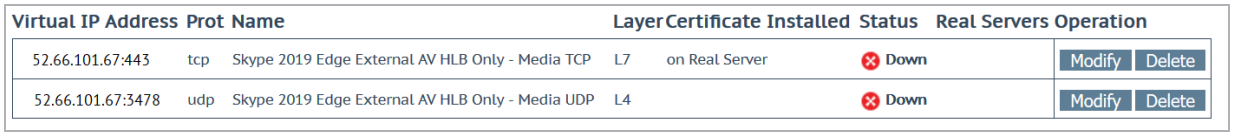
API Parameter	API Value
PersistTimeout	1200
Schedule	lc
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	443

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.



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.

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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.

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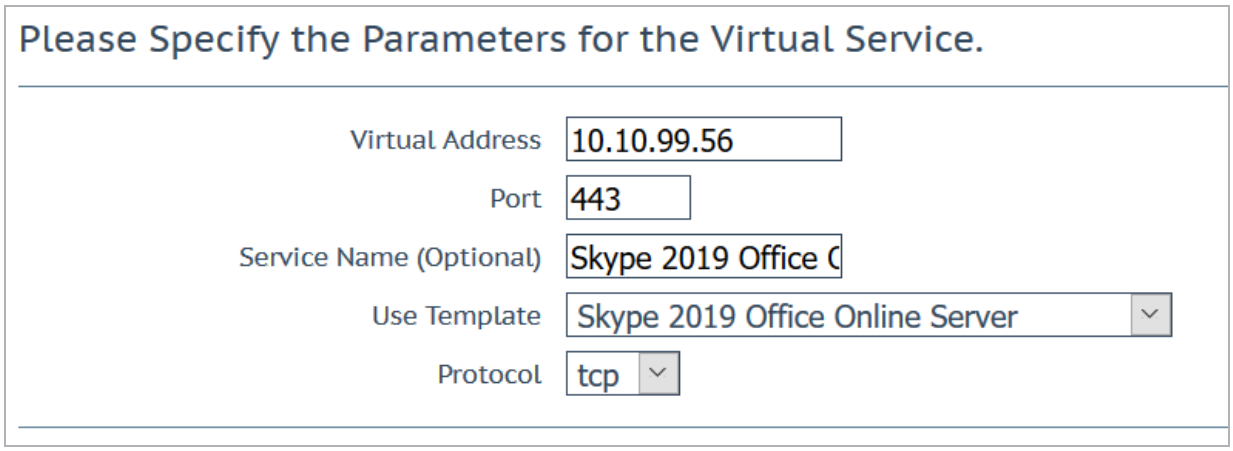
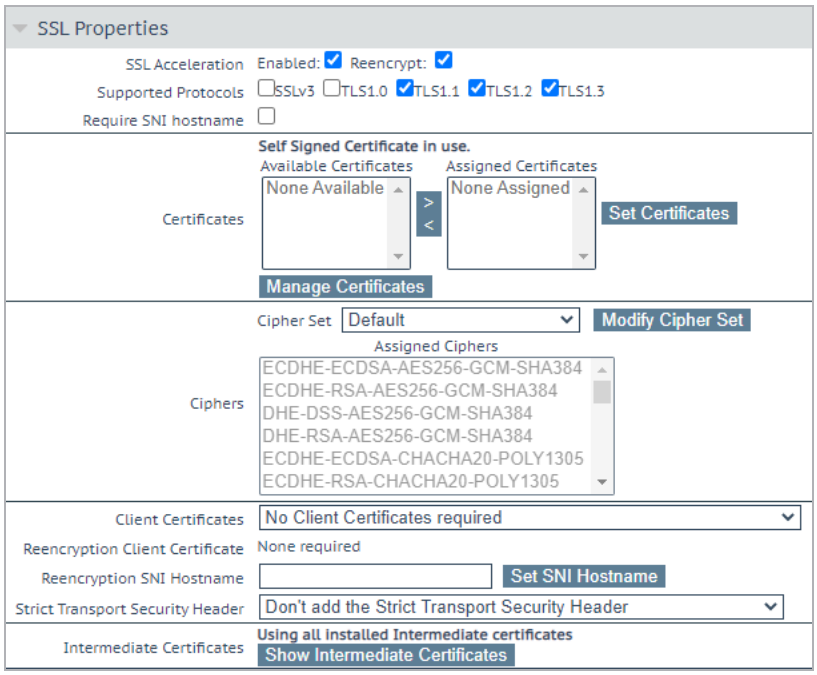


2. Enter a **Virtual Address**.
3. Select **Skype Office Online Servers** in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.
5. Expand the **SSL Properties** section.



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

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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

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5.4.2 Director Reverse Proxy

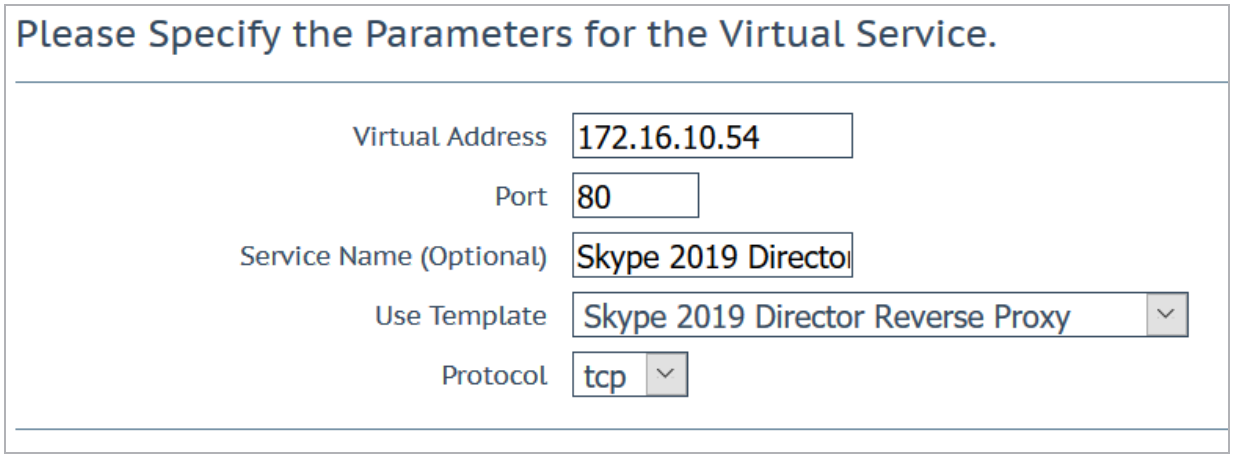
The Skype 2019 Director Reverse Proxy template contains two Virtual Services:

- 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.

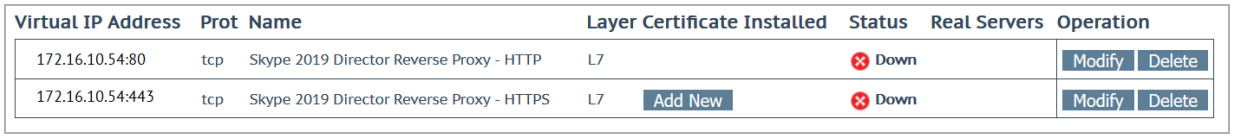


2. Enter a **Virtual Address**.
3. Select the **Skype 2019 Director Reverse Proxy** template in the **Use Template** drop-down list.
4. Click **Add This Virtual Service**.

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.



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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 **p**ort

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:

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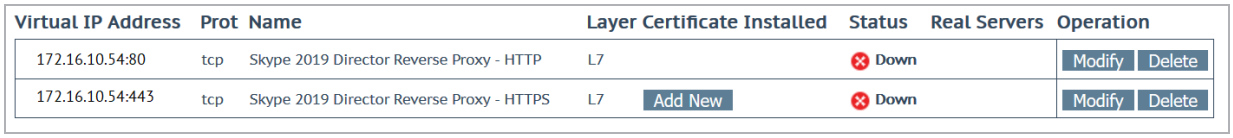
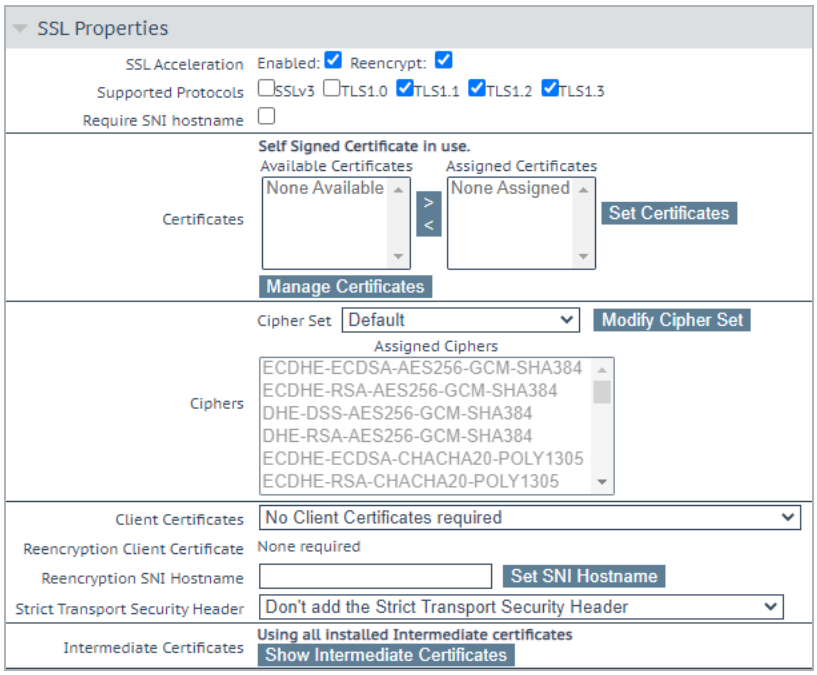
1. Select **View/Modify Services** under **Virtual Services** in the left-hand navigation.



2. Click **Modify** on the **Skype 2019 Director 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 **443** as the Real Server port.

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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.

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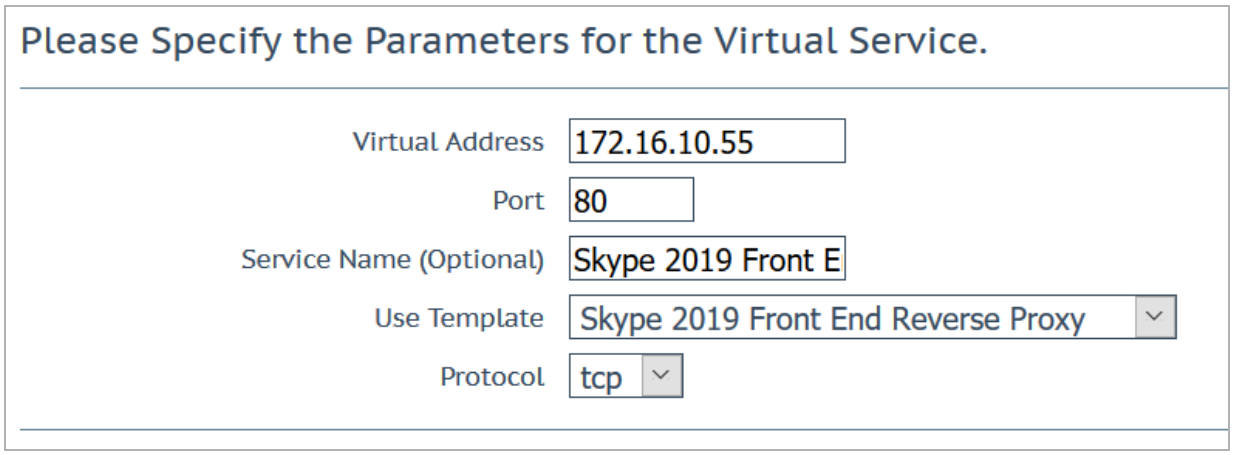


2. Enter a **Virtual Address**.

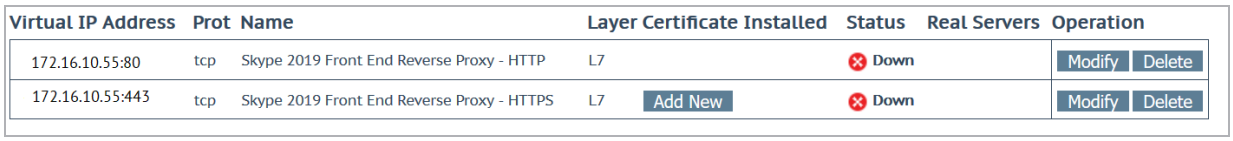
3. Select the **Skype 2019 For Business 2019 Front End Reverse Proxy** template in the **Use Template** drop-down list.

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.



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 **p**ort.

8. Add additional Real Servers as needed.

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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.

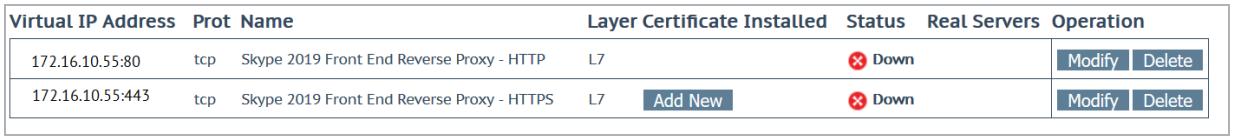
API Parameter	API Value
port	80
prot	tcp
ForceL7	1
Transparent	0
Persist	none
Schedule	lc
UseforSnat	1
Idletime	1800
CheckType	tcp
CheckPort	5061

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.



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

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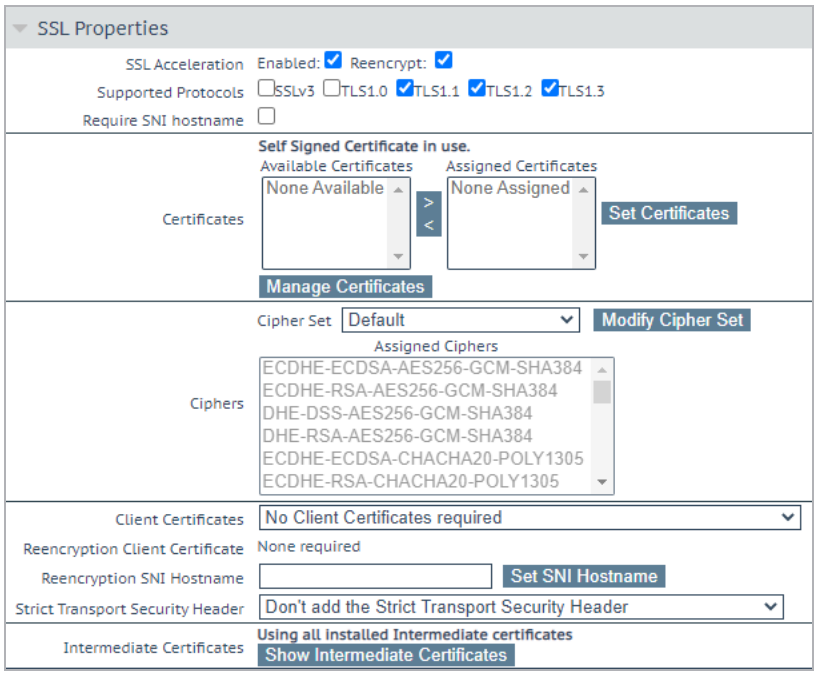

4. Select a valid certificate that was previously imported and click the **>** button to assign the certificate**.**

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.

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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.

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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

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7 References

The following sources are referred to in this document:

Kemp website

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

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Last Updated Date

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