

VMware Horizon 7 and Horizon 8

Deployment Guide

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Table of Contents

1 Introduction **8**

1.1 Document Purpose 9

1.2 Intended Audience 9

1.3 About this Document 9

2 Template **10**

3 Architecture **12**

4 Horizon Protocols **14**

4.1 Primary Horizon Protocol 14

4.2 Secondary Horizon Protocols 14

5 Configure the LoadMaster **16**

5.1 Enable Subnet Originating Requests Globally 16

5.2 Enable Check Persist Globally 17

6 Unified Access Gateway Session Affinity Options **18**

6.1 Method 1 - Source IP Affinity 18

6.2 Method 2 - Multiple Port Number Groups 19

6.3 Method 3 - Multiple VIPs 21

7 Virtual Service - Connection Server **23**

7.1 Create the Connection Server Virtual Services 23

7.1.1 Connection Server Virtual Service Recommended API Settings (optional) 24

7.1.2 Connection Server Redirect Virtual Service Recommended API Settings (optional) 25

8 Virtual Service - Unified Access Gateway (UAG) **26**

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8.1 Source IP Affinity UAG Configuration (Method 1) 27

8.2 Source IP Affinity Virtual Services (Method 1) 27

8.2.1 Create the UAG Source IP Affinity Virtual Service 28

8.2.1.1 Configure the UAG TCP HTTPS - Source IP Affinity Virtual Service 28

8.2.1.1.1 UAG TCP HTTPS - Source IP Affinity Virtual Service Recommended API Settings (optional) 29

8.2.1.2 Configure the UAG TCP PCoIP - Source IP Affinity Virtual Service 29

8.2.1.2.1 UAG TCP PCoIP - Source IP Affinity Virtual Service Recommended API Settings (optional) 30

8.2.1.3 Configure the UAG UDP PCoIP - Source IP Affinity Virtual Service 31

8.2.1.3.1 UAG UDP PCoIP - Source IP Affinity Virtual Service Recommended API Settings (optional) 31

8.2.1.4 Configure the UAG TCP Blast - Source IP Affinity Virtual Service 32

8.2.1.4.1 UAG TCP Blast - Source IP Affinity Virtual Service Recommended API Settings (optional) 33

8.2.1.5 Configure the UAG UDP Blast - Source IP Affinity Virtual Service 33

8.2.1.5.1 UAG UDP Blast - Source IP Affinity Virtual Service Recommended API Settings (optional) 34

8.3 Multiple Port Affinity UAG Configuration (Method 2) 34

8.4 Multiple Port Affinity Virtual Services (Method 2) 35

8.4.1 Create the UAG Multiple Port Affinity Virtual Service 35

8.4.1.1 Configure the UAG TCP HTTPS - Multi-Port Affinity Virtual Service 36

8.4.1.1.1 UAG TCP HTTPS – Multi-Port Affinity Virtual Service Recommended API Settings (optional) 37

8.4.1.2 Configure the UAG1 TCP Blast - Multi Port Affinity Virtual Service 37

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8.4.1.2.1 UAG1 TCP Blast – Multi-Port Affinity Virtual Service Recommended API Settings (optional) 38

8.4.1.3 Configure the UAG1 UDP Blast - Multi Port Affinity Virtual Service 38

8.4.1.3.1 UAG1 UDP Blast – Multi-Port Affinity Virtual Service Recommended API Settings (optional) 39

8.4.1.4 Configure the UAG1 TCP PCoIP - Multi Port Affinity Virtual Service 39

8.4.1.4.1 UAG1 TCP PCoIP – Multi-Port Affinity Virtual Service Recommended API Settings (optional) 40

8.4.1.5 Configure the UAG1 UDP PCoIP - Multi-Port Affinity Virtual Service 40

8.4.1.5.1 UAG1 UDP PCoIP – Multi-Port Affinity Virtual Service Recommended API Settings (optional) 41

8.4.1.6 Configure UAG2 TCP Blast – Multi-Port Affinity Virtual Service 41

8.4.1.6.1 UAG2 TCP Blast – Multi-Port Affinity Virtual Service Recommended API Settings (optional) 41

8.4.1.7 Configure UAG2 UDP Blast – Multi-Port Affinity Virtual Service 42

8.4.1.7.1 UAG2 UDP Blast – Multi-Port Affinity Virtual Service Recommended API Settings (optional) 42

8.4.1.8 Configure UAG2 TCP PCoIP – Multi-Port Affinity Virtual Service 43

8.4.1.8.1 UAG2 TCP PCoIP – Multi-Port Affinity Virtual Service Recommended API Settings (optional) 43

8.4.1.9 Configure UAG2 UDP PCoIP – Multi-VIP Affinity Virtual Service 44

8.4.1.9.1 UAG2 UDP PCoIP – Multi-Port Affinity Virtual Service Recommended API Settings (optional) 44

8.4.2 Example LoadMaster Configuration – Multiple Port Affinity 45

8.4.3 Duplicate Virtual Service (Optional) 45

8.5 Multiple VIP Affinity UAG Configuration (Method 3) 47

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8.6 Multiple VIP Affinity Virtual Services (Method 3) 47

8.6.1 Create the UAG Multiple VIP Affinity HTTPS Virtual Service 48

8.6.1.1 Configure UAGLB TCP HTTPS – Multi-VIP Affinity Virtual Service 48

8.6.1.1.1 UAGLB TCP HTTPS – Multi-VIP Affinity Virtual Service Recommended API Settings (optional) 49

8.6.2 Create the UAG1 Multiple VIP Affinity Blast and PCoIP Virtual Service 49

8.6.2.1 Configure UAG1 TCP Blast – Multi-VIP Affinity Virtual Service 50

8.6.2.1.1 UAG1 TCP Blast – Multi-VIP Affinity Virtual Service Recommended API Settings (optional) 51

8.6.2.2 Configure UAG1 UDP Blast – Multi-VIP Affinity 52

8.6.2.2.1 UAG1 UDP Blast – Multi-VIP Affinity Virtual Service Recommended API Settings (optional) 52

8.6.2.3 Configure UAG1 TCP PCoIP – Multi-VIP Affinity Virtual Service 53

8.6.2.3.1 UAG1 TCP PCoIP – Multi-VIP Affinity Virtual Service Recommended API Settings (optional) 53

8.6.2.4 Configure UAG1 UDP PCoIP – Multi-VIP Affinity Virtual Service 54

8.6.2.4.1 UAG1 UDP PCoIP – Multi-VIP Affinity Virtual Service Recommended API Settings (optional) 54

8.6.3 Create the UAG2 Multiple VIP Affinity Blast and PCoIP Virtual Service 54

8.6.3.1 Configure UAG2 TCP Blast – Multi-VIP Affinity Virtual Service 55

8.6.3.1.1 UAG2 TCP Blast – Multi-VIP Affinity Virtual Service Recommended API Settings (optional) 56

8.6.3.2 Configure UAG2 UDP Blast – Multi-VIP Affinity Virtual Service 56

8.6.3.2.1 UAG2 UDP Blast – Multi-VIP Affinity Virtual Service Recommended API Settings (optional) 57

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8.6.3.3 Configure UAG2 TCP PCoIP – Multi-VIP Affinity Virtual Service 57

8.6.3.3.1 UAG2 TCP PCoIP – Multi-VIP Affinity Virtual Service Recommended API Settings (optional) 58

8.6.3.4 Configure UAG2 UDP PCoIP – Multi-VIP Affinity Virtual Service 58

8.6.3.4.1 UAG2 UDP PCoIP – Multi-VIP Affinity Virtual Service Recommended API Settings (optional) 59

8.6.4 Example LoadMaster Configuration – Multiple VIP Affinity 59

9 App Volume Manager 61

9.1 Create the App Volume Manager Virtual Services 61

9.1.1 App Volume Manager Virtual Service Recommended API Settings (optional) 62

9.1.2 App Volume Manager Redirect Virtual Service Recommended API Settings (optional) 63

10 Workspace One Access 64

10.1 Create the Workspace One Access Virtual Services 64

10.1.1 Workspace One Access Virtual Service Recommended API Settings (optional) 65

10.1.2 Workspace One Access Redirect Virtual Service Recommended API Settings (optional) 66

Last Updated Date 67

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1 Introduction

VMware Horizon is a virtual desktop infrastructure (VDI) solution that simplifies administration and delivery of personalized virtual desktops. It consists of several components and delivers a secure optimized virtual desktop infrastructure.

This deployment guide focuses on the load balancing requirements for the Horizon and Unified Access Gateway (UAG) use cases. It discusses the distinction between the primary and secondary Horizon protocols and describes the three methods for guaranteeing session affinity. The three methods ensure that all protocol traffic from a Horizon client session goes to the same Unified Access Gateway appliance. This article also covers health monitoring and SSL bridging for load balancers.

Unified Access Gateway (Access Point) is a Unified Gateway from VMware that comes in virtual appliance format and is designed to protect desktop and application resources to enable remote access from the internet. Unified Access Gateway is the default gateway for the following products:

- VMware Horizon
- VMware Horizon Air (DaaS)
- VMware Horizon Air Hybrid-Mode
- VMware Workspace One Access
- Airwatch Tunnel Gateway/Proxy

Connection Servers are the core component of VMware Horizon. This role defines virtual desktop pools, applications, and permissions.

App Volume Manager is a console for managing configuration, creation of AppStacks, and assignment of AppStacks and writable volumes.

Workspace One Access is a portal where users gain access to different types of applications including Software as a Service (SaaS) based, enterprise identity management to sync and extend Active Directory, and single sign on.

The Kemp LoadMaster is used to load balance the VMware Unified Access Gateway, Connection Servers, Workspace One Access, and App Volume Manager. The LoadMaster offers advanced Layer 4 and Layer 7 server load balancing, SSL Acceleration, and a multitude of other advanced Application Delivery Controller (ADC) features. The LoadMaster intelligently and efficiently distributes user traffic among the application servers so that users get the best experience possible.

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This document provides guidance and recommended settings on how to load balance Horizon 7 or Horizon 8 with a Kemp LoadMaster. The Kemp Support Team is available to provide solutions for scenarios not explicitly defined.

The Kemp support site can be found at: https://support.kemptechnologies.com.

1.1 Document Purpose

This document provides the recommended LoadMaster settings used when load balancing the VMware Horizon use cases using the Unified Access Gateway. The Kemp Support Team is available to provide solutions for scenarios not explicitly defined. The Kemp support site can be found at: https://support.kemptechnologies.com.

1.2 Intended Audience

This document is intended to be read by anyone who is interested in configuring the LoadMaster to optimize VMware Horizon workload.

1.3 About this Document

This document was written with help from Mark Benson and Vish Kalsi of VMware. Some of the content in this document is based on the following VMware document: https://communities.vmware.com/docs/DOC-32792

In addition, you can find more information at https://www.vmware.com/support/pubs/access-point-pubs.html

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2 Template

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

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.

Depending on the configuration of Horizon 7 or Horizon 8 and UAG, the following templates are provided to address the different methods outlined in this guide:

- **Horizon 7 and Horizon 8:** This template includes Virtual Services that support VMware Horizon 7 or Horizon 8 Connection Servers, App Volume Manager, and Workspace One Access.
- **UAG – Source IP Affinity:** This template includes Virtual Services that support Unified Access Gateway using Method 1 (Source IP Affinity).
    - **Advantages of Source IP Affinity:**
        - Uses standard port numbers
        - Does not require multiple virtual IP addresses
    - **Disadvantages of Source IP Affinity:**
        - Relies on source IP address affinity, which is not always possible
- **UAG – Multi-Port Affinity:** This template includes Virtual Services that support Unified Access Gateway using Method 2 (Multiple Port Affinity).
    - **Advantages of Multiple Port Number Groups:**
        - Does not rely on source IP affinity
        - Does not require multiple public virtual IP addresses

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- **Disadvantages of Multiple Port Number Groups:**
    - Uses non-standard port numbers from the internet. Although the port numbers on the Unified Access Gateway appliances themselves are standard.
- **UAG – Multi-VIP Affinity:** This template includes Virtual Services that support Unified Access Gateway using Method 3 (Multiple VIP Affinity).
    - **Advantages of Multiple VIPs:**
        - Does not rely on source IP affinity
        - Uses standard port numbers
    - **Disadvantages of Multiple VIPs:**
        - Requires an additional public-facing VIP for each Unified Access Gateway appliance in addition to the primary load-balanced VIP

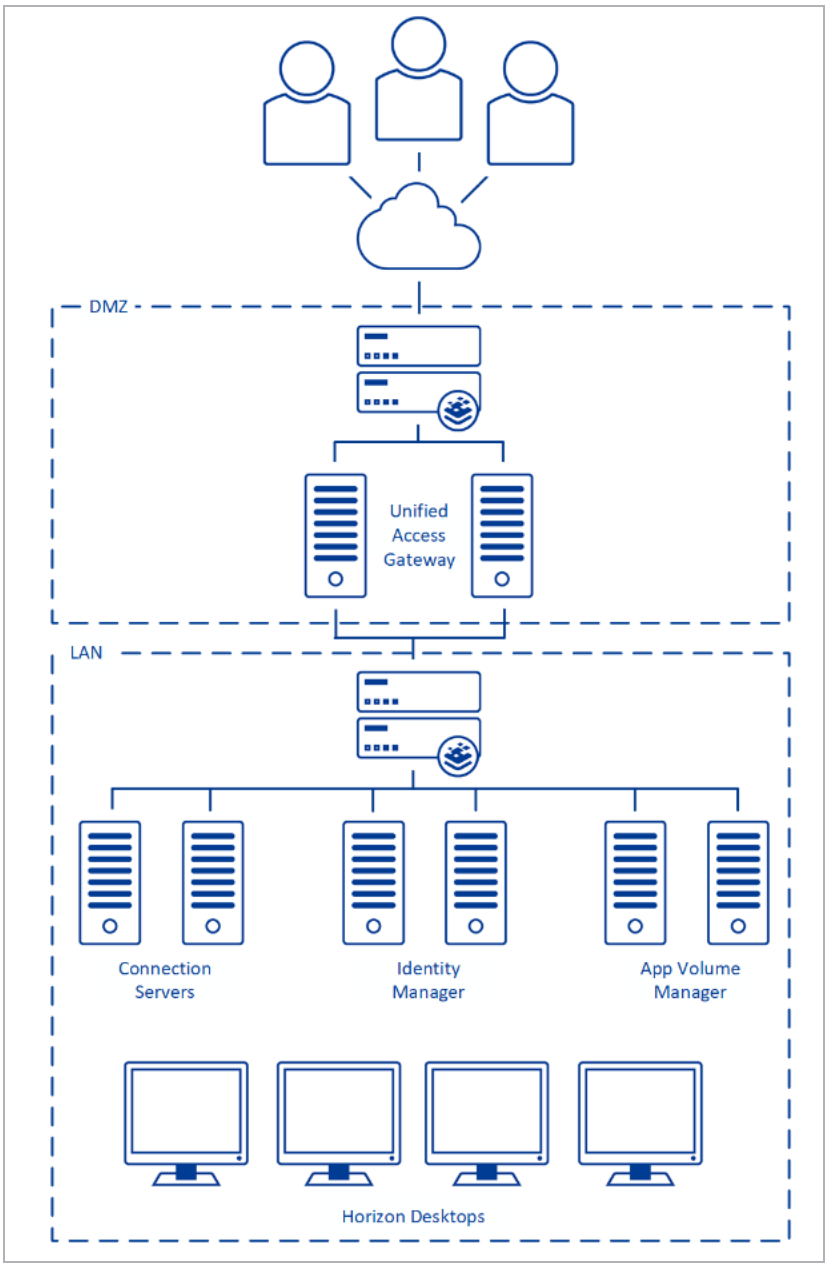
For more information and steps on how to import and use templates, refer to the Virtual Services and Templates, Feature Description on the Kemp Documentation page.

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3 Architecture

Unified Access Gateway is typically deployed in a DMZ. For high availability and scalability requirements in a production deployment, several Unified Access Gateway appliances are usually set up behind a load balancer as shown in Figure 3-1. The LoadMaster is deployed in-line as a proxy for all services including PCoIP. Alternative deployment options could have the secondary Horizon protocols bypass the LoadMaster as it is only the initial session establishment (HTTPS) that can be load balanced.

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4 Horizon Protocols

When a Horizon Client user connects to a Horizon environment, several different protocols are used. The first connection is always the primary XML-API protocol over HTTPS. Following successful authentication, one or more secondary protocols are also made.

4.1 Primary Horizon Protocol

The user enters a hostname at the Horizon Client and this starts the primary Horizon protocol. This is a control protocol for authentication, authorization and session management. It uses XML-structured messages over HTTPS (HTTP over SSL). This protocol is sometimes known as the Horizon XML-API control protocol. In a load-balanced environment as shown in the **Architecture** section, the load balancer routes this connection to one of the Unified Access Gateway appliances. The load balancer usually selects the appliance based first on availability, and then out of the available appliances that will route traffic based on the least number of current sessions. This has the effect of evenly distributing the traffic from different clients across the available set of Unified Access Gateway appliances.

4.2 Secondary Horizon Protocols

After the Horizon Client has established a secure communication to one of the Unified Access Gateway appliances, the user authenticates. If this authentication attempt is successful, then one or more secondary connections are made from the Horizon client. These secondary connections can include:

- HTTPS Tunnel used for encapsulating TCP protocols such as RDP, MMR/CDR and the client framework channel (TCP 443).
- Blast Extreme display protocol (TCP 443 or UDP 8443).
- PCoIP display protocol (TCP 4172 and UDP 4172).

These secondary Horizon protocols must be routed to the same Unified Access Gateway appliance to which the primary Horizon protocol is routed. This is so that Unified Access Gateway can authorize the secondary protocols based on the authenticated user session. An important security capability of Unified Access Gateway is that it will only forward traffic into the corporate datacenter if the traffic is on behalf of an authenticated user. If the secondary protocols were to be misrouted to a different Unified Access Gateway appliance to the primary protocol one, they would not be

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authorized and would therefore be dropped in the DMZ and the connection would fail. Misrouting the secondary protocols is a common problem if the Load Balancer is not configured correctly.

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5 Configure the LoadMaster

The deployed VMware Unified Access Gateway environment determines which of the following setups is used.

5.1 Enable Subnet Originating Requests Globally

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

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

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



When **Subnet Originating Requests** is enabled, the 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.

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5.2 Enable Check Persist Globally

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

1. Go to **System Configuration > Miscellaneous Options > L7 Configuration**.
2. Click the **Always Check Persist** drop-down arrow and select **Yes – Accept Changes**.

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6 Unified Access Gateway Session Affinity Options

There are three main configuration options for session affinity. These are:

- Source IP Affinity
- Multiple Port Number Groups
- Multiple VIPs

6.1 Method 1 - Source IP Affinity

Method 1 is recommended for all environments where source IP address affinity is possible. Where it is not possible, then either method 2 or method 3 should be used.

Method 1 is the simplest configuration for a load balancer because it uses standard port numbers and a single load balanced VIP. It relies on the load balancer to route secondary protocols to the same Unified Access Gateway appliance as was selected for the primary Horizon protocol. It does this based on repeat connections coming from the same Horizon client IP address. Unfortunately, this method does not work in all situations. For example, with certain Network Service Providers or NAT devices, the source IP address is not available for this affinity configuration. If source IP affinity cannot be used in your environment, then one of the other two methods should be used as they do not rely on source IP affinity.

Unified Access Gateway Configuration for External URLs for this configuration is shown in the following table.

In our example, the Fully Qualified Domain Name (FQDN) https://uag.myco.com resolves to 10.10.10.154.

Unified Access Gateway Appliance	Configuration Item	Value
UAG01	tunnelExternalURL	https://uag.myco.com:443
UAG01	blastExternalURL	https://uag.myco.com:443
UAG01	pcoipExternalURL	10.10.10.154:4172

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Unified Access Gateway Appliance	Configuration Item	Value
UAG02	tunnelExternalURL	https://uag.myco.com:443
UAG02	blastExternalURL	https://uag.myco.com:443
UAG02	pcoipExternalURL	10.10.10.154:4172

The use of Blast port TCP/8443 can be leveraged but is not required.

Advantages of Source IP Affinity

- Uses standard port numbers
- Does not require multiple public virtual IP addresses

Disadvantages of Source IP Affinity

- Relies on source IP address affinity, which is not always possible.

6.2 Method 2 - Multiple Port Number Groups

Multiple port group affinity does not rely on source IP address for affinity. Instead, the load balancer is configured to route the secondary Horizon protocols based on a group of unique port numbers assigned to each Unified Access Gateway appliance. The primary Horizon protocol on HTTPS port 443 is load balanced to allocate the session to a specific Unified Access Gateway appliance based on health and least loaded. The secondary connections are then routed to the correct Unified Access Gateway appliance based on the following Load Balancer configuration table.

Virtual IP Address	Primary/ Secondary	Protocol	Name	Real Servers
10.10.10.154:443	Primary	TCP	UAGLB - HTTPS	10.10.10.90:443 10.10.10.91:443
10.10.10.154:10143	Secondary	TCP	UAG01 - HTTPS	10.10.10.90:443
10.10.10.154:10143	Secondary	UDP	UAG01 - BLAST-UDP	10.10.10.90:8443
10.10.10.154:10172	Secondary	TCP	UAG01 -	10.10.10.90:4172

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Virtual IP Address	Primary/ Secondary	Protocol	Name	Real Servers
			PCOIP	
10.10.10.154:10172	Secondary	UDP	UAG01 - PCOIP-UDP	10.10.10.90:4172
10.10.10.154:10243	Secondary	TCP	UAG02 - HTTPS	10.10.10.91:443
10.10.10.154:10243	Secondary	UDP	UAG02 - BLAST-UDP	10.10.10.91:8443
10.10.10.154:10272	Secondary	TCP	UAG02 - PCOIP	10.10.10.91:4172
10.10.10.154:10272	Secondary	UDP	UAG02 - PCOIP-UDP	10.10.10.91:4172

The same port mapping scheme can be used for additional Unified Access Gateway appliances 03 > 99. For example, we use the following mapping convention in this document for Unified Access Gateway.

The Unified Access Gateway Configuration for External URLs is shown below.

In our example, the FQDN http://uag.myco.com resolves to 10.10.10.154.

Unified Access Gateway Appliance	Configuration Item	Value
UAG01	tunnelExternalURL	https://uag.myco.com:10143
UAG01	blastExternalURL	https://uag.myco.com:10143
UAG01	pcoipExternalURL	10.10.10.154:10172
UAG02	tunnelExternalURL	https://uag.myco.com:10243
UAG02	blastExternalURL	https://uag.myco.com:10243
UAG02	pcoipExternalURL	10.10.10.154:10272

Advantages of Multiple Port Number Groups:

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- Does not rely on source IP affinity
- Does not require multiple public virtual IP addresses

Disadvantages of Multiple Port Number Groups:

Uses non-standard port numbers from the Internet although the port numbers on the Unified Access Gateway appliances themselves are standard.

6.3 Method 3 - Multiple VIPs

This method is similar to the multiple port groups method except instead of dedicating a group of port numbers to each Unified Access Gateway appliance, it dedicates an individual VIP to each appliance in addition to the primary load balanced VIP. If you have two Unified Access Gateway appliances, then you would set up three VIPs. The primary Horizon protocol on HTTPS port 443 is load balanced to allocate the session to a specific Unified Access Gateway appliance based on health and least loaded. The secondary connections are then routed to the correct Unified Access Gateway appliance based on the following Load Balancer configuration table.

Unified Access Gateway Configurations for External URLs for this configuration are shown in the following table.

Virtual IP Address	Primary/Secondary	Protocol	Name	Real Servers
10.10.10.154:443	Primary	TCP	UAGLB - HTTPS	10.10.10.90:443 10.10.10.91:443
10.10.10.156:443	Secondary	TCP	UAG01 - HTTPS BLAST	10.10.10.90:443
10.10.10.156:8443	Secondary	UDP	UAG01 - BLAST-UDP	10.10.10.90:8443
10.10.10.156:4172	Secondary	TCP	UAG01 - PCOIP	10.10.10.90:4172
10.10.10.156:4172	Secondary	UDP	UAG01 - PCOIP-UDP	10.10.10.90:4172
10.10.10.157:443	Secondary	TCP	UAG02 - BLAST	10.10.10.91:443
10.10.10.157:8443	Secondary	UDP	UAG02 - BLAST-UDP	10.10.10.91:8443
10.10.10.157:4172	Secondary	TCP	UAG02 - PCOIP	10.10.10.91:4172
10.10.10.157:4172	Secondary	UDP	UAG02 - PCOIP-UDP	10.10.10.91:4172

In our example, the FQDN http://uag1.myco.com resolves to 10.10.10.156 and https://uag2.myco.com resolves to 10.10.10.157.

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Unified Access Gateway Appliance	Configuration Item	Value
UAG01	tunnelExternalURL	https://uag1.myco.com:443
UAG01	blastExternalURL	https://uag1.myco.com:8443
UAG01	pcoipExternalURL	10.10.10.156:4172
UAG02	tunnelExternalURL	https://uag2.myco.com:443
UAG02	blastExternalURL	https://uag2.myco.com:8443
UAG02	pcoipExternalURL	10.10.10.157:4172

Advantages of multiple VIPs:

- Do not rely on source IP affinity
- Uses standard port numbers

Disadvantages of multiple VIPs

Requires an additional public facing VIP for each Unified Access Gateway appliance in addition to the primary load balanced VIP.

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7 Virtual Service - Connection Server

The Connection Server is a core component of VMware Horizon. This role defines virtual desktop pools, applications, and permissions. The initial Primary Horizon Protocol is load balanced between Connection Servers in the environment. The Secondary Horizon Protocols are connected by directly bypassing the load balancer.

This step-by-step setup of Virtual Services (VSs) leverages the Kemp application template for **Horizon 7 and Horizon 8**.

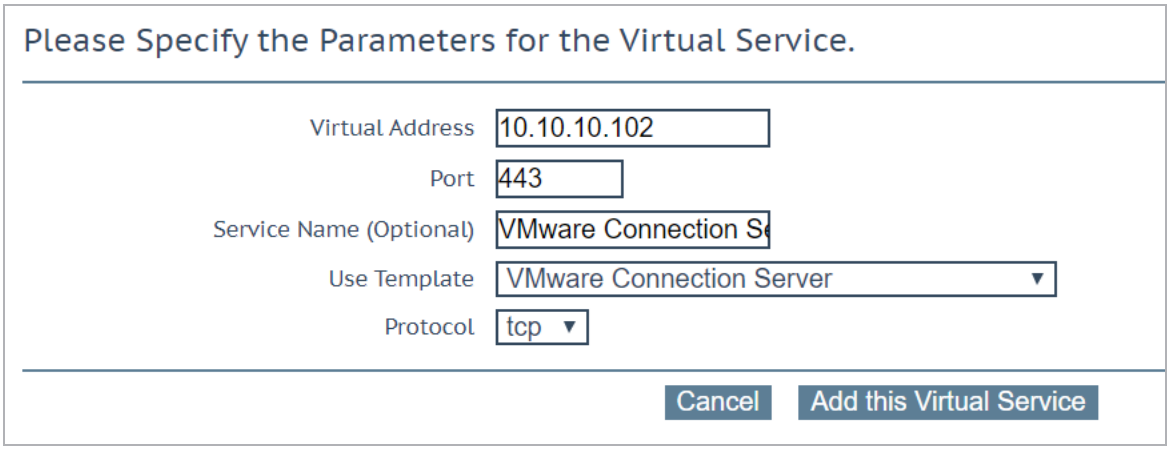
The table in each section outlines the settings configured by the application template. You can use this information to manually configure Virtual Services or use the Kemp LoadMaster Application Programming Interface (API) and automation tools.

SSL/TLS certificates should be added before creating this Virtual Service. For further information on certificates, refer to the SSL Accelerated Services Feature Description.

7.1 Create the Connection Server Virtual Services

The following are the steps involved and the recommended settings to configure the VMware Connection Server Virtual Service:

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



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2. Type a valid **Virtual Address**.
3. Select the **VMware Connection Server** template in the **Use Template** drop-down list.
4. Click **Add this Virtual Service**.
5. In the main menu, go to **Virtual Services > View/Modify Services**.
6. Click **Modify** on the relevant Virtual Service on TCP port 443.
7. Expand the **SSL Properties** section.
8. Select the certificate to use from **Available Certificates** and click the arrow (**>**) to move it to **Assigned Certificates**.
9. Expand the **Real Servers** section.
10. Click **Add New**.
11. Type the **Real Server Address**.
12. Confirm that port **443** is entered.
13. Click **Add This Real Server**.
14. Repeat the steps above to add more Real Servers as needed.

7.1.1 Connection Server Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	443
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
Persist	src

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PersistTimeout	3600
CheckType	https
Checkurl	/favicon.ico
CheckUseGet	1

7.1.2 Connection Server Redirect Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	80
prot	tcp
VStype	http
Forcel7	1
Transparent	0
ErrorCode	302
ErrorUrl	https://%h%s
CheckType	None

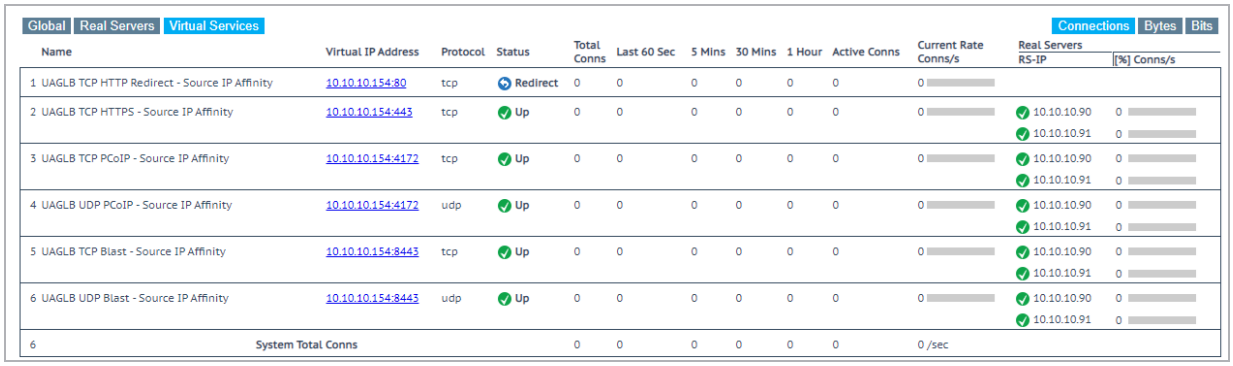
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8 Virtual Service - Unified Access Gateway (UAG)

The UAG is a core component of VMware Horizon. This role provides access to virtual desktop pools and applications for external users. The initial Primary Horizon Protocol is load balanced between UAG servers in the environment. The Secondary Horizon Protocols are directed to correct UAG based on the configuration (method) used.



The templates to support different UAG methods include different protocols to support different customer environments. In most cases, one or more Virtual Services created by the template are not used. For instance, the following Virtual Services are optional if only the Blast protocol was used in the example provided in the **Source IP Affinity UAG Configuration (Method 1)** section of this guide.



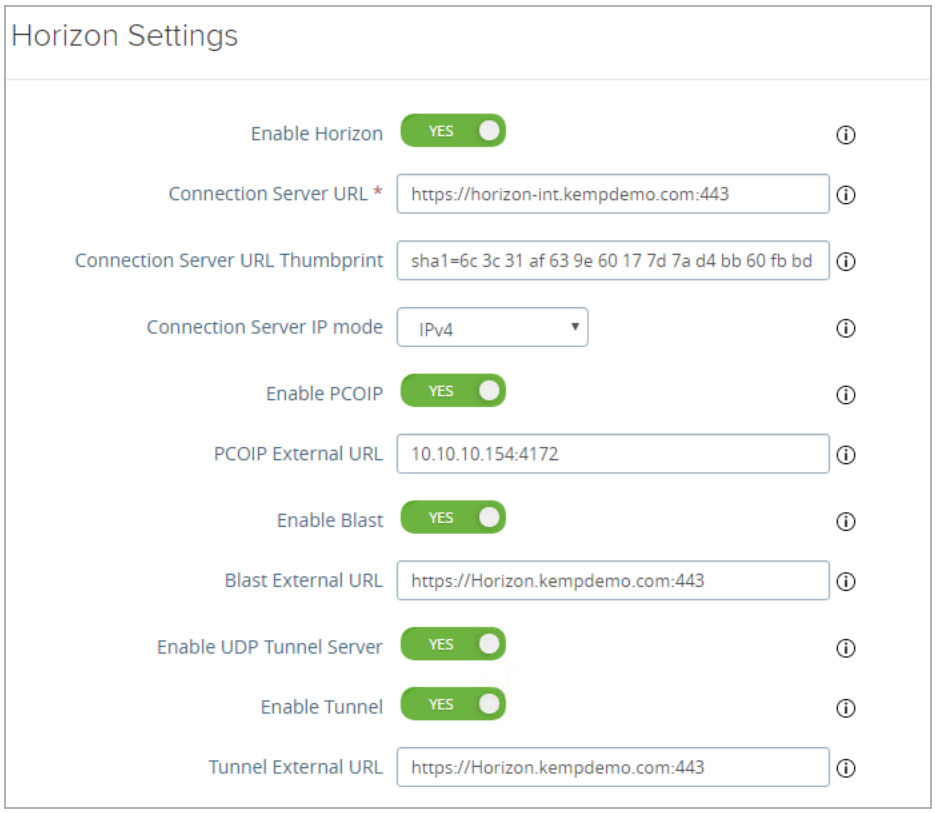
Kemp recommends all Virtual Services get configured and the connections to these be monitored using the **Real Time Statistics**. If no connections are being recorded on these optional Virtual Services, they can be disabled or deleted to clean up the LoadMaster configuration.

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8.1 Source IP Affinity UAG Configuration (Method 1)

The following is an example of a Unified Access Gateway configuration to support Source IP Affinity:

- The URL (Horizon-int.kempdemo.com) in this example points to the internal LoadMaster (10.10.10.103) publishing Connection Servers as configured in the **Create the Connection Server Virtual Services** section.
- The URL (Horizon.kempdemo.com) in this example points to the public IP address (10.10.10.154) of the external LoadMaster publishing the UAG servers.
- The IP address (10.10.10.154) in this example would be the public IP address of the external LoadMaster publishing the UAG Servers.



8.2 Source IP Affinity Virtual Services (Method 1)

This step-by-step setup of Virtual Services leverages the Kemp application template for **UAG - Source IP Affinity**.

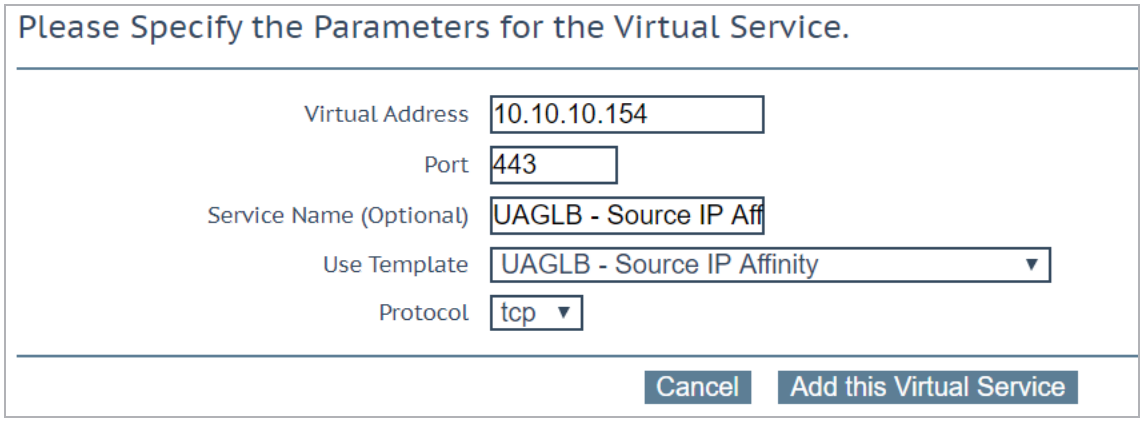
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The table in each section outlines the settings configured by the application template. You can use this information to manually configure Virtual Services or use the Kemp LoadMaster API and automation tools.

8.2.1 Create the UAG Source IP Affinity Virtual Service

The following are the steps involved and the recommended settings to configure the VMware UAG Source IP Affinity Virtual Service:

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

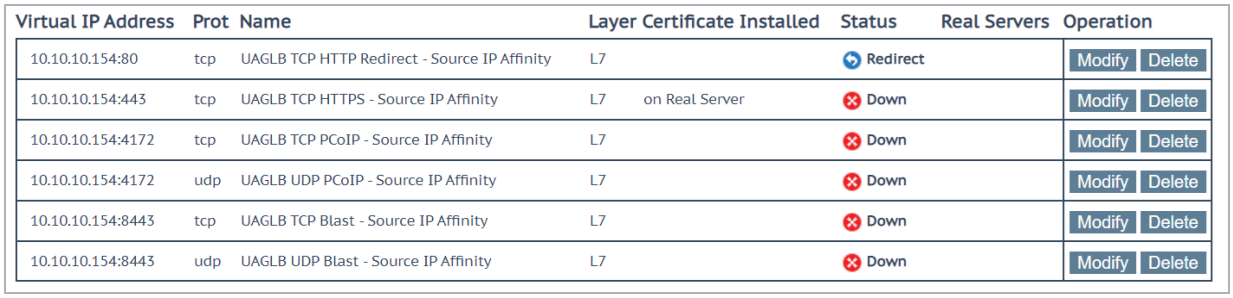


2. Type a valid **Virtual Address**.
3. Select the **UAGLB - Source IP Affinity** template in the **Use Template** drop-down list.
4. Click **Add this Virtual Service**.

8.2.1.1 Configure the UAG TCP HTTPS - Source IP Affinity Virtual Service

To configure this Virtual Service, follow the steps below:

1. In the main menu of the LoadMaster WUI, select **View/Modify Services**.



Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.10.154:80	tcp	UAGLB TCP HTTP Redirect - Source IP Affinity	L7		Redirect		Modify Delete
10.10.10.154:443	tcp	UAGLB TCP HTTPS - Source IP Affinity	L7	on Real Server	Down		Modify Delete
10.10.10.154:4172	tcp	UAGLB TCP PCoIP - Source IP Affinity	L7		Down		Modify Delete
10.10.10.154:4172	udp	UAGLB UDP PCoIP - Source IP Affinity	L7		Down		Modify Delete
10.10.10.154:8443	tcp	UAGLB TCP Blast - Source IP Affinity	L7		Down		Modify Delete
10.10.10.154:8443	udp	UAGLB UDP Blast - Source IP Affinity	L7		Down		Modify Delete

2. Click **Modify** on the **UAGLB TCP HTTPS -Source IP Affinity** Virtual Service.

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3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Confirm that port **443** is entered.
7. Click **Add This Real Server**.
8. Repeat these steps to add more Real Servers as needed.

8.2.1.1.1 UAG TCP HTTPS - Source IP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	443
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
Persist	src
PersistTimeout	3600
CheckType	https
Checkurl	/favicon.ico
CheckUseGet	0

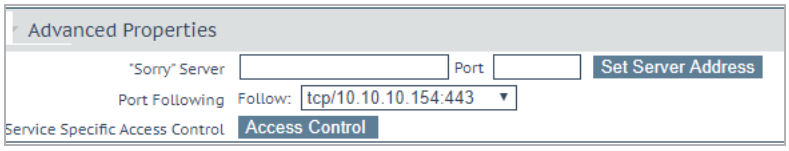
8.2.1.2 Configure the UAG TCP PCoIP - Source IP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, select **View/Modify Services**.
2. Click **Modify** on the **UAGLB TCP PCoIP -Source IP Affinity** Virtual Service.

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3. Expand the **Advanced Properties** section.



4. In the **Port Following** drop-down list, select the Virtual Service with port **443**.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Address**.
8. Confirm that port **4172** is entered.
9. Click **Add This Real Server**.
10. Repeat these steps to add more Real Servers as needed.

8.2.1.2.1 UAG TCP PCoIP - Source IP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	4172
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
Persist	src
PersistTimeout	3600
FollowVSID	<Specify Virtual Service ID>

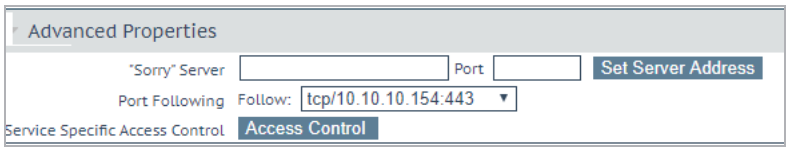
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API Parameter	API Value
CheckType	tcp
Checkport	4172

8.2.1.3 Configure the UAG UDP PCoIP - Source IP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAGLB UDP PCoIP -Source IP Affinity** Virtual Service.
3. Expand the **Advanced Properties** section.



4. In the **Port Following** drop-down list, select the Virtual Service with port **443**.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Addres**s.
8. Confirm that port **4172** is entered.
9. Click **Add This Real Server**.
10. Repeat this step to add more Real Servers as needed.

8.2.1.3.1 UAG UDP PCoIP - Source IP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	4172
prot	udp

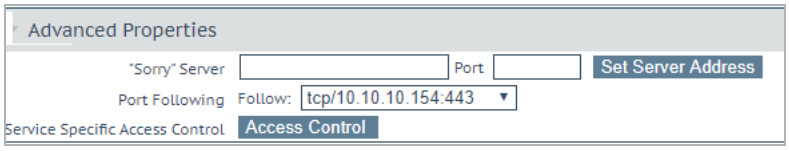
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API Parameter	API Value
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
Persist	src
PersistTimeout	3600
FollowVSID	<Specify Virtual Service ID>
CheckType	icmp

8.2.1.4 Configure the UAG TCP Blast - Source IP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAGLB TCP Blast -Source IP Affinity** Virtual Service.
3. Expand the **Advanced Properties** section.



4. In the **Port Following** drop-down list, select the Virtual Service with port **443**.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Address**.
8. Confirm that port **8443** is entered.
9. Click **Add This Real Server**.
10. Repeat these steps to add more Real Servers as needed.

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8.2.1.4.1 UAG TCP Blast - Source IP Affinity Virtual Service Recommended API Settings (optional)

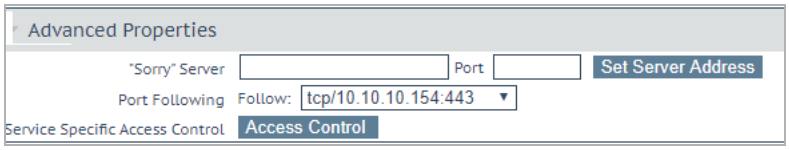
This table outlines the API parameters and values set using the Kemp application template. You can use these settings with scripts and automation tools.

API Parameter	API Value
port	8443
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
Persist	src
PersistTimeout	3600
FollowVSID	<Specify Virtual Service ID>
CheckType	tcp
Checkport	8443

8.2.1.5 Configure the UAG UDP Blast - Source IP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAGLB UDP Blast - Source IP Affinity** Virtual Service.
3. Expand the **Advanced Properties** section.



4. In the **Port Following** drop-down list, select the Virtual Service with port **443**.

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5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Address**.
8. Confirm that port **8443** is entered.
9. Click **Add This Real Server**.
10. Repeat these steps to add more Real Servers as needed.

8.2.1.5.1 UAG UDP Blast - Source IP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	8443
prot	udp
SubnetOriginating	1
ForceL7	1
Transparent	0
Schedule	lc
Persist	src
PersistTimeout	3600
FollowVSID	<Specify Virtual Service ID>
CheckType	icmp

8.3 Multiple Port Affinity UAG Configuration (Method 2)

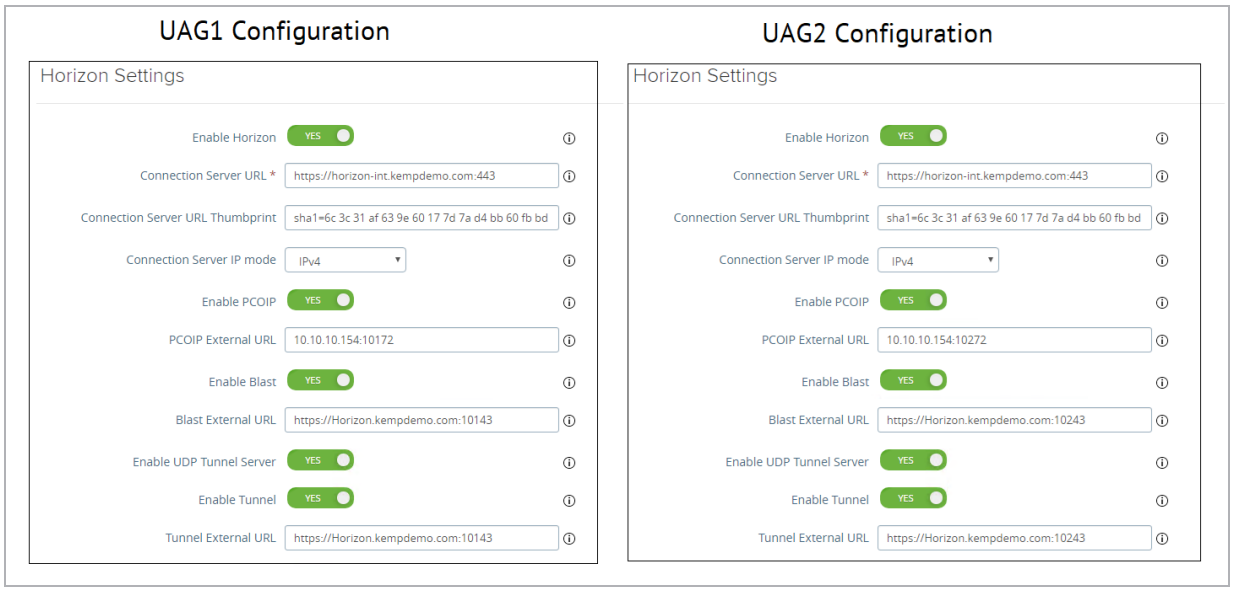
The following is an example of a Unified Access Gateway configuration to support Multiple Port Affinity. Each configuration is set with unique ports to direct clients to the correct UAG node.

- The URL (Horizon-int.kempdemo.com) in this example points to the internal LoadMaster (10.10.10.103) publishing Connection Servers as configured in the **Create the Connection**

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Server Virtual Services section.

- The URL (Horizon.kempdemo.com) in this example points to the public IP address (10.10.10.154) of the external LoadMaster publishing the UAG Servers.
- The IP address (10.10.10.154) in this example would be the public IP address of the external LoadMaster publishing the UAG Servers.



8.4 Multiple Port Affinity Virtual Services (Method 2)

This step-by-step setup of Virtual Services leverages the Kemp application template for **UAG – Multiple Port Affinity**.

> This template deploys Virtual Services to support two UAGs. If the environment requires three or more UAGs, follow the steps in the **Duplicate Virtual Service (Optional)** section.

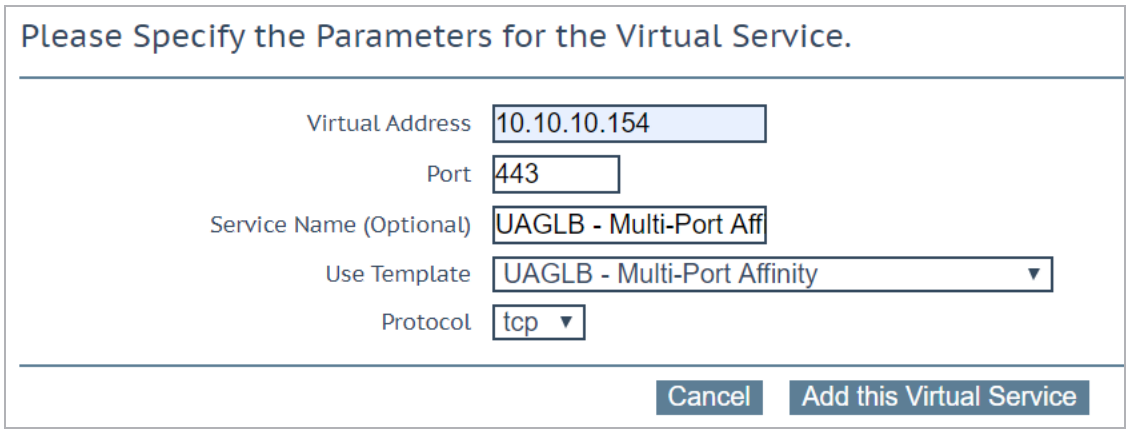
The table in each section outlines the settings configured by the application template. You can use this information to manually configure Virtual Services or use the Kemp LoadMaster API and automation tools.

8.4.1 Create the UAG Multiple Port Affinity Virtual Service

The following are the steps involved and the recommended settings to configure the VMware UAG Multi-Port Affinity Virtual Service:

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

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2. Type a valid **Virtual Address**.
3. Select the **UAGLB - Multi-Port Affinity** template in the **Use Template** drop-down list.
4. Click **Add this Virtual Service**.

8.4.1.1 Configure the UAG TCP HTTPS - Multi-Port Affinity Virtual Service

To configure this Virtual Service, follow the steps below:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.10.154:80	tcp	UAGLB TCP HTTP Redirect - Multi-Port Affinity	L7		Redirect		Modify Delete
10.10.10.154:443	tcp	UAGLB TCP HTTPS - Multi-Port Affinity	L7	on Real Server	Down		Modify Delete
10.10.10.154:10143	tcp	UAG1 TCP Blast - Multi-Port Affinity	L7		Down		Modify Delete
10.10.10.154:10143	udp	UAG1 UDP Blast - Multi-Port Affinity	L7		Down		Modify Delete
10.10.10.154:10172	tcp	UAG1 TCP PCoIP - Multi-Port Affinity	L7		Down		Modify Delete
10.10.10.154:10172	udp	UAG1 UDP PCoIP - Multi-Port Affinity	L7		Down		Modify Delete
10.10.10.154:10243	tcp	UAG2 TCP Blast - Multi-Port Affinity	L7		Down		Modify Delete
10.10.10.154:10243	udp	UAG2 UDP Blast - Multi-Port Affinity	L7		Down		Modify Delete
10.10.10.154:10272	tcp	UAG2 TCP PCoIP - Multi-Port Affinity	L7		Down		Modify Delete
10.10.10.154:10272	udp	UAG2 UDP PCoIP - Multi-Port Affinity	L7		Down		Modify Delete

2. Click **Modify** on the **UAGLB TCP HTTPS -Multi-Port Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.

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6. Confirm that port **443** is entered.
7. Click **Add This Real Server**.
8. Repeat these steps to add more Real Servers as needed.

> This Virtual Service will be the only one with multiple Real Servers.

8.4.1.1.1 UAG TCP HTTPS – Multi-Port Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	443
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	https
Checkurl	/favicon.ico
CheckUseGet	0

8.4.1.2 Configure the UAG1 TCP Blast - Multi Port Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG1 TCP Blast -Multi-Port Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.

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5. Type the **Real Server Address**.
6. Update the Real Server **Port** to **443**.
7. Click **Add This Real Server**.

> UAG1 should be the only Real Server added to this Virtual Service.

8.4.1.2.1 UAG1 TCP Blast – Multi-Port Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	10143
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	tcp
Checkport	443

8.4.1.3 Configure the UAG1 UDP Blast - Multi Port Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG1 UDP Blast – Multi-Port Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.

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6. Update the Real Server **Port** to **8443**.
7. Click **Add This Real Server**.

> UAG1 should be the only Real Server added to this Virtual Service.

8.4.1.3.1 UAG1 UDP Blast – Multi-Port Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	10143
prot	udp
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	icmp

8.4.1.4 Configure the UAG1 TCP PCoIP - Multi Port Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG1 TCP PCoIP – Multi-Port Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Confirm that port **4172** is entered.
7. Click **Add This Real Server**.

UAG1 should be the only Real Server added to this Virtual Service.

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8.4.1.4.1 UAG1 TCP PCoIP – Multi-Port Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	10172
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	tcp
Checkport	4172

8.4.1.5 Configure the UAG1 UDP PCoIP - Multi-Port Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG1 UDP PCoIP -Multi-Port Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Update the Real Server **Port** to **4172**.
7. Click **Add This Real Server**.

UAG1 should be the only Real Server added to this Virtual Service.

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8.4.1.5.1 UAG1 UDP PCoIP – Multi-Port Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	10172
prot	udp
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	icmp

8.4.1.6 Configure UAG2 TCP Blast – Multi-Port Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG2 TCP Blast -Multi-Port Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Update the Real Server **Port** to **443**.
7. Click **Add This Real Server**.

> UAG2 should be the only Real Server added to this Virtual Service.

8.4.1.6.1 UAG2 TCP Blast – Multi-Port Affinity Virtual Service Recommended API Settings (optional)

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

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API Parameter	API Value
port	10243
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	tcp
Checkport	443

8.4.1.7 Configure UAG2 UDP Blast – Multi-Port Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG2 UDP Blast – Multi-Port Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Update the Real Server **Port** to **8443**.
7. Click **Add This Real Server**.

> UAG2 should be the only Real Server added to this Virtual Service.

8.4.1.7.1 UAG2 UDP Blast – Multi-Port Affinity Virtual Service Recommended API Settings (optional)

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

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API Parameter	API Value
port	10243
prot	udp
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	icmp

8.4.1.8 Configure UAG2 TCP PCoIP – Multi-Port Affinity Virtual Service

.Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG2 TCP PCoIP – Multi-Port Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Update the Real Server **Port** to **4172**.
7. Click **Add This Real Server**.

> UAG2 should be the only Real Server added to this Virtual Service.

8.4.1.8.1 UAG2 TCP PCoIP – Multi-Port Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	10272

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API Parameter	API Value
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	tcp
Checkport	4172

8.4.1.9 Configure UAG2 UDP PCoIP – Multi-VIP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAGLB UDP PCoIP – Multi-VIP Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Update the Real Server **Port** to **4172**.
7. Click **Add This Real Server**.

> UAG2 should be the only Real Server added to this Virtual Service.

8.4.1.9.1 UAG2 UDP PCoIP – Multi-Port Affinity Virtual Service Recommended API Settings (optional)

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

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API Parameter	API Value
port	10272
prot	udp
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	icmp

8.4.2 Example LoadMaster Configuration – Multiple Port Affinity

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.10.154:80	tcp	UAGLB TCP HTTP Redirect - Multi-Port Affinity	L7		Redirect		Modify Delete
10.10.10.154:443	tcp	UAGLB TCP HTTPS - Multi-Port Affinity	L7	on Real Server	Up	10.10.10.90 10.10.10.91	Modify Delete
10.10.10.154:10143	tcp	UAG1 TCP Blast - Multi-Port Affinity	L7		Up	10.10.10.90:443	Modify Delete
10.10.10.154:10143	udp	UAG1 UDP Blast - Multi-Port Affinity	L7		Up	10.10.10.90:8443	Modify Delete
10.10.10.154:10172	tcp	UAG1 TCP PCoIP - Multi-Port Affinity	L7		Up	10.10.10.90:4172	Modify Delete
10.10.10.154:10172	udp	UAG1 UDP PCoIP - Multi-Port Affinity	L7		Up	10.10.10.90:4172	Modify Delete
10.10.10.154:10243	tcp	UAG2 TCP Blast - Multi-Port Affinity	L7		Up	10.10.10.91:443	Modify Delete
10.10.10.154:10243	udp	UAG2 UDP Blast - Multi-Port Affinity	L7		Up	10.10.10.91:8443	Modify Delete
10.10.10.154:10272	tcp	UAG2 TCP PCoIP - Multi-Port Affinity	L7		Up	10.10.10.91:4172	Modify Delete
10.10.10.154:10272	udp	UAG2 UDP PCoIP - Multi-Port Affinity	L7		Up	10.10.10.91:4172	Modify Delete

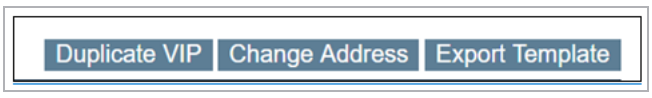
8.4.3 Duplicate Virtual Service (Optional)

To support additional UAG appliances, the Blast and PCoIP Virtual Services must be created for each. This section provides the necessary steps to add the UAG server to the configuration.

Follow the steps below to configure this Virtual Service:

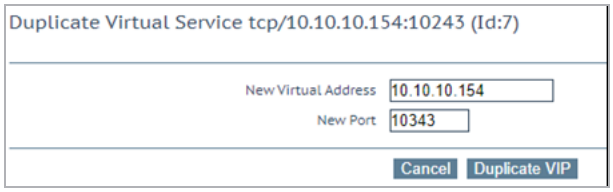
1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.

2. Click **Modify** on the **UAG2 TCP Blast – Multi-Port Affinity** Virtual Service.



3. Click **Duplicate VIP**.

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4. Keep the same Virtual Address and change the port to **10343**.

5. Click **Duplicate VIP**.

6. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.

7. Click **Modify** on the **UAG2 TCP Blast – Multi-Port Affinity [1]** Virtual Service.

8. Modify the **Service Name** (for example, **UAG3 TCP Blast – Multi-Port Affinity**)

9. Expand the **Real Servers** section.

10. Click **Delete** to remove the **Real Server** listed.

11. Click **OK** on remove Real Server confirmation.

12. Click **Add New**.

13. Type the **Real Server Address**.

14. Confirm that port **443** is entered.

15. Click **Add This Real Server**.

> UAG3 should be the only Real Server added to this Virtual Service.

16. Repeat the above steps for:

Virtual Service to Duplicate	New Virtual Service Port	Real Server Port
UAG2 UDP Blast – Multi-Port Affinity	10343	8443
UAG2 TCP PCoIP – Multi-Port Affinity	10372	1072
UAG2 UDP PCoIP – Multi-Port Affinity	10372	1072

> The same port mapping scheme can be used for additional Unified Access Gateway appliances, 103xx – 199xx.

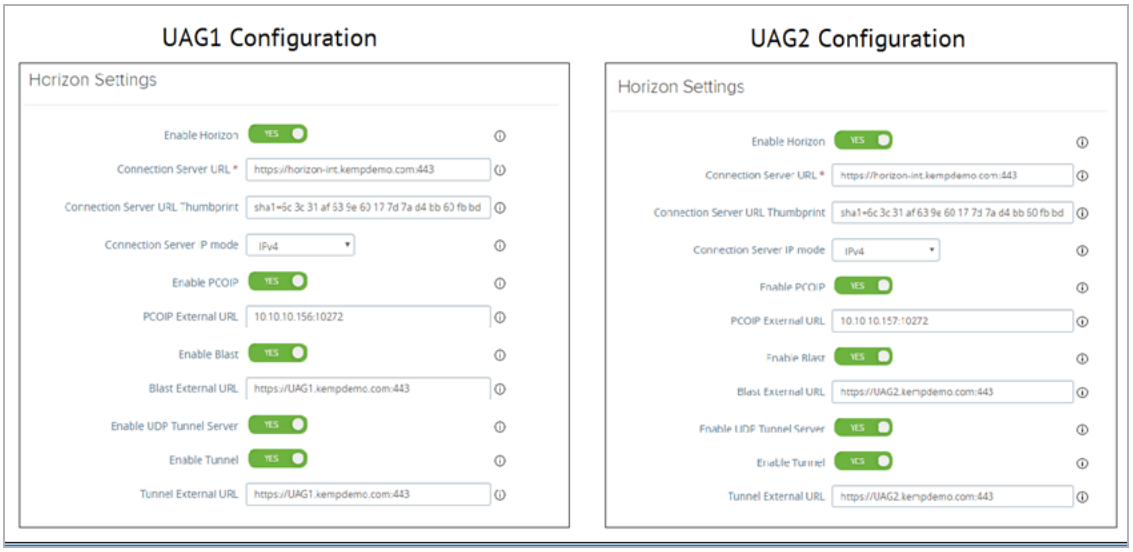
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8.5 Multiple VIP Affinity UAG Configuration (Method 3)

The following is an example of a Unified Access Gateway configuration to support Multiple VIP Affinity. Each configuration is set with a unique IP address to direct clients to the correct UAG node.

- The URL (Horizon-int.kempdemo.com) in this example points to the internal LoadMaster (10.10.10.103) publishing Connection Servers as configured in **Create the Connection Server Virtual Services**.
- The URL (Horizon.kempdemo.com) in this example points to the IP address (10.10.10.154) of the external LoadMaster publishing the UAG Servers.
- The IP address (10.10.10.156) in this example would be the public IP address of the external LoadMaster publishing UAG1.
- The IP address (10.10.10.157) in this example would be the public IP address of the external LoadMaster publishing UAG2.

> This method uses port TCP 443 for Blast. The Virtual Service can be updated to support TCP 8443 should the environment require that configuration.



8.6 Multiple VIP Affinity Virtual Services (Method 3)

This step-by-step setup of VSs leverages the Kemp application template for **UAG – Multiple VIP Affinity**.

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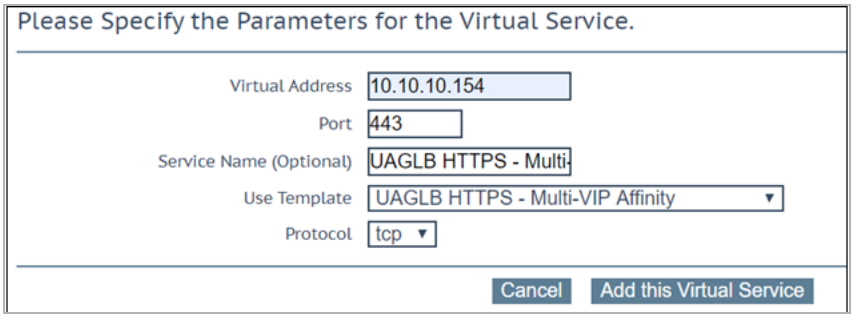
> Each template configuration can only support a single VIP. Because this method leverages multiple VIPs, two templates must be used.

The table in each section outlines the settings configured by the application template. You can use this information to manually configure Virtual Services or use the Kemp LoadMaster Application Programming Interface (API) and automation tools.

8.6.1 Create the UAG Multiple VIP Affinity HTTPS Virtual Service

The following are the steps involved and the recommended settings to configure the V**Mware UAG Multi-VIP Affinity** Virtual Service:

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



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

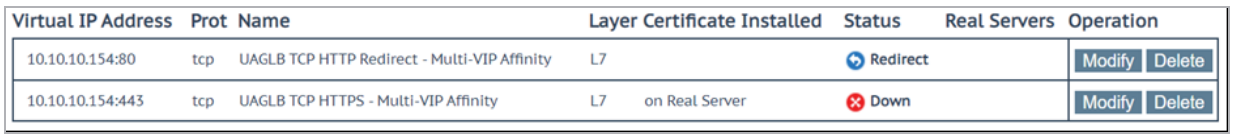
3. Select the **UAGLB HTTPS Multi-VIP Affinity** template from the **Use Template** drop-down list.

4. Click **Add this Virtual Service**.

8.6.1.1 Configure UAGLB TCP HTTPS – Multi-VIP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.



2. Click **Modify** on the **UAGLB TCP HTTPS -Multi-VIP Affinity** Virtual Service.

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3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Confirm that port **443** is entered.
7. Click **Add This Real Server**.
8. Repeat this step to add more Real Servers as needed.

> This Virtual Service will be the only one with multiple Real Servers.

8.6.1.1.1 UAGLB TCP HTTPS – Multi-VIP Affinity Virtual Service Recommended API Settings (optional)

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

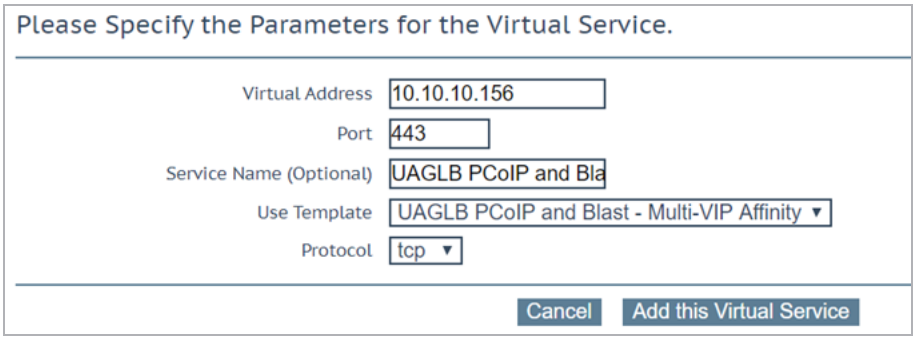
API Parameter	API Value
port	443
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	https
Checkurl	/favicon.ico
CheckUseGet	0
CheckPort	443

8.6.2 Create the UAG1 Multiple VIP Affinity Blast and PCoIP Virtual Service

The following are the steps involved and the recommended settings to configure the **VMware UAG Multi-VIP Affinity** Virtual Service:

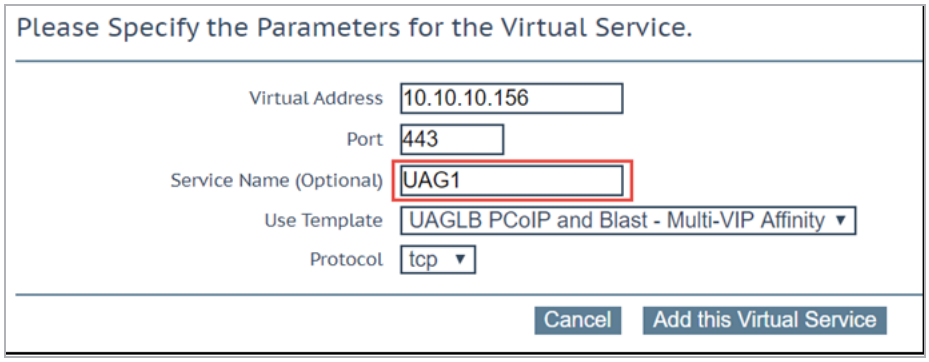
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1. In the main menu of the LoadMaster Web User Interface (WUI), go to **Virtual Services > Add New**.



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

3. Select the **UAGLB PCoIP and Blast Multi-VIP Affinity** template in the **Use Template** drop-down list.



4. Replace the **Service Name** with unique label to prevent duplicate Virtual Service names (for example, **UAG1**).

> If you skip renaming the Virtual Service, the Virtual Service creation for the remaining UAG applications later in this guide will fail.

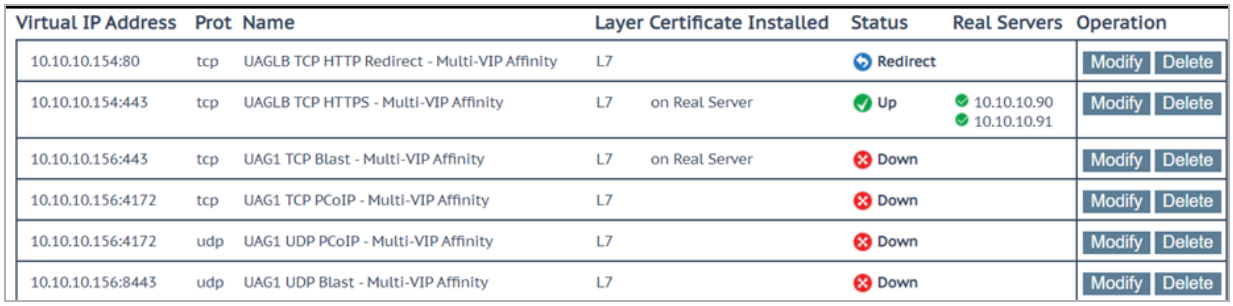
5. Click **Add this Virtual Service**.

8.6.2.1 Configure UAG1 TCP Blast – Multi-VIP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.

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Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.10.154:80	tcp	UAGLB TCP HTTP Redirect - Multi-VIP Affinity	L7		Redirect		Modify Delete
10.10.10.154:443	tcp	UAGLB TCP HTTPS - Multi-VIP Affinity	L7	on Real Server	Up	10.10.10.90 10.10.10.91	Modify Delete
10.10.10.156:443	tcp	UAG1 TCP Blast - Multi-VIP Affinity	L7	on Real Server	Down		Modify Delete
10.10.10.156:4172	tcp	UAG1 TCP PCoIP - Multi-VIP Affinity	L7		Down		Modify Delete
10.10.10.156:4172	udp	UAG1 UDP PCoIP - Multi-VIP Affinity	L7		Down		Modify Delete
10.10.10.156:8443	udp	UAG1 UDP Blast - Multi-VIP Affinity	L7		Down		Modify Delete

2. Click **Modify** on the **UAG1 TCP Blast -Multi-VIP Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Confirm that port **443** is entered.
7. Click **Add This Real Server**.

> UAG1 should be the only Real Server added to this Virtual Service.

8.6.2.1.1 UAG1 TCP Blast – Multi-VIP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	443
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	tcp

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API Parameter	API Value
Checkport	443

8.6.2.2 Configure UAG1 UDP Blast – Multi-VIP Affinity

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the on **UAG1 UDP Blast – Multi-VIP Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Confirm that port **8443** is entered.
7. Click **Add This Real Server**.

> UAG1 should be the only Real Server added to this Virtual Service.

8.6.2.2.1 UAG1 UDP Blast – Multi-VIP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	8443
prot	udp
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	icmp

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8.6.2.3 Configure UAG1 TCP PCoIP – Multi-VIP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG1 TCP PCoIP – Multi-Port Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Confirm that port **4172** is entered.
7. Click **Add This Real Server**.

> UAG1 should be the only Real Server added to this Virtual Service.

8.6.2.3.1 UAG1 TCP PCoIP – Multi-VIP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	4172
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	tcp
Checkport	4172

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8.6.2.4 Configure UAG1 UDP PCoIP – Multi-VIP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG1 UDP PCoIP -Multi-VIP Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Confirm that port **4172** is entered.
7. Click **Add This Real Server**.

> UAG1 should be the only Real Server added to this Virtual Service.

8.6.2.4.1 UAG1 UDP PCoIP – Multi-VIP Affinity Virtual Service Recommended API Settings (optional)

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

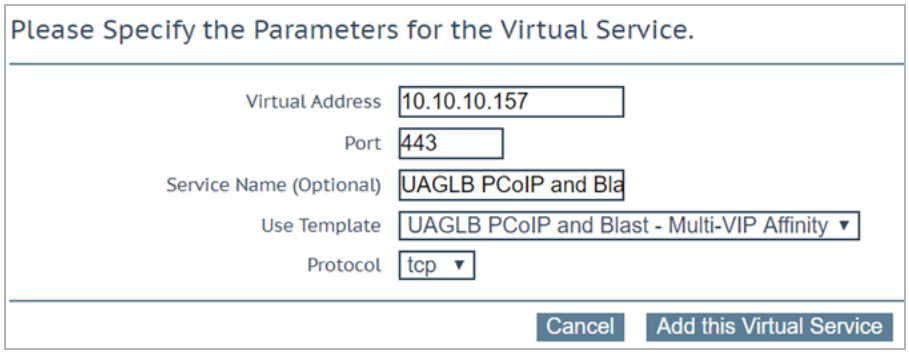
API Parameter	API Value
port	4172
prot	udp
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	icmp

8.6.3 Create the UAG2 Multiple VIP Affinity Blast and PCoIP Virtual Service

Follow the steps below to configure this Virtual Service:

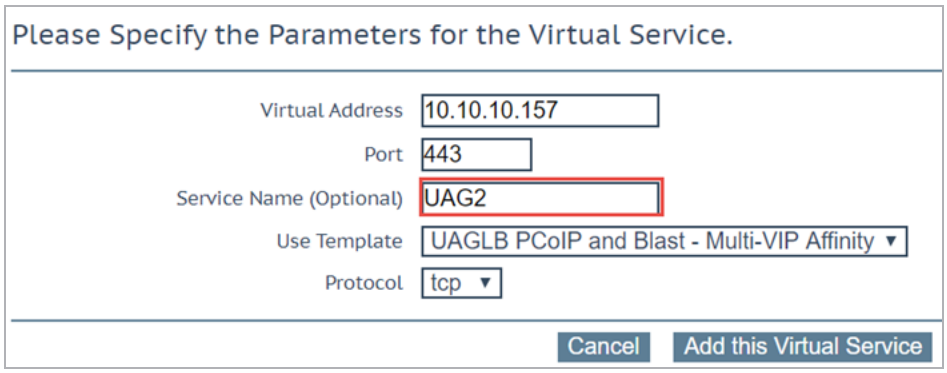
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1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.



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

3. Select the **UAGLB PCoIP and Blast Multi-VIP Affinity** template in the **Use Template** drop-down list.



4. Replace the **Service Name** with a unique label to prevent duplicate Virtual Service names (for example, **UAG2**).

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

> If the Virtual Service creation fails, it is possible that you skipped the step to rename the Virtual Service and therefore there is a name duplication error thrown.

8.6.3.1 Configure UAG2 TCP Blast – Multi-VIP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.

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2. Click **Modify** on the **UAG2 TCP Blast -Multi-VIP Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Confirm that port 443 is entered.
7. Click **Add This Real Server**.

> UAG2 should be the only Real Server added to this Virtual Service.

8.6.3.1.1 UAG2 TCP Blast – Multi-VIP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	443
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	tcp
Checkport	443

8.6.3.2 Configure UAG2 UDP Blast – Multi-VIP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG2 TCP Blast -Multi-VIP Affinity** Virtual Service.

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3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Confirm that port **8443** is entered.
7. Click **Add This Real Server**.

> UAG2 should be the only Real Server added to this Virtual Service.

8.6.3.2.1 UAG2 UDP Blast – Multi-VIP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	8443
prot	udp
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	icmp

8.6.3.3 Configure UAG2 TCP PCoIP – Multi-VIP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAG2 TCP PCoIP – Multi-VIP Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.

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6. Confirm that port **4172** is entered.
7. Click **Add This Real Server**.

> UAG2 should be the only Real Server added to this Virtual Service.

8.6.3.3.1 UAG2 TCP PCoIP – Multi-VIP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	4172
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	tcp
Checkport	4172

8.6.3.4 Configure UAG2 UDP PCoIP – Multi-VIP Affinity Virtual Service

Follow the steps below to configure this Virtual Service:

1. In the main menu of the LoadMaster WUI, go to **Virtual Services > View/Modify Services**.
2. Click **Modify** on the **UAGLB UDP PCoIP – Multi-VIP Affinity** Virtual Service.
3. Expand the **Real Servers** section.
4. Click **Add New**.
5. Type the **Real Server Address**.
6. Update the Real Server **Port** to **4172**.

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

> UAG2 should be the only Real Server added to this Virtual Service.

8.6.3.4.1 UAG2 UDP PCoIP – Multi-VIP Affinity Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	4172
prot	udp
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
CheckType	icmp

8.6.4 Example LoadMaster Configuration – Multiple VIP Affinity

Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.10.154:80	tcp	UAGLB TCP HTTP Redirect - Multi-VIP Affinity	L7		Redirect		Modify Delete
10.10.10.154:443	tcp	UAGLB TCP HTTPS - Multi-VIP Affinity	L7	on Real Server	Up	10.10.10.90 10.10.10.91	Modify Delete
10.10.10.156:443	tcp	UAG1 TCP Blast - Multi-VIP Affinity	L7	on Real Server	Up	10.10.10.90	Modify Delete
10.10.10.156:4172	tcp	UAG1 TCP PCoIP - Multi-VIP Affinity	L7		Up	10.10.10.90	Modify Delete
10.10.10.156:4172	udp	UAG1 UDP PCoIP - Multi-VIP Affinity	L7		Up	10.10.10.90	Modify Delete
10.10.10.156:8443	udp	UAG1 UDP Blast - Multi-VIP Affinity	L7		Up	10.10.10.90	Modify Delete
10.10.10.157:443	tcp	UAG2 TCP Blast - Multi-VIP Affinity	L7	on Real Server	Up	10.10.10.91	Modify Delete
10.10.10.157:4172	tcp	UAG2 TCP PCoIP - Multi-VIP Affinity	L7		Up	10.10.10.91	Modify Delete
10.10.10.157:4172	udp	UAG2 UDP PCoIP - Multi-VIP Affinity	L7		Up	10.10.10.91	Modify Delete
10.10.10.157:8443	udp	UAG2 UDP Blast - Multi-VIP Affinity	L7		Up	10.10.10.91	Modify Delete

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Additional UAG appliances can be added to the configuration by using the Blast and PCoIP template. You must use a unique Virtual Service IPaddress and name.

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9 App Volume Manager

The App Volume Manager is a console for managing configuration, creation of AppStacks, and assignment of AppStacks and writable volumes.

This step-by-step setup of VSs leverages the Kemp application template for Horizon 7 and Horizon 8.

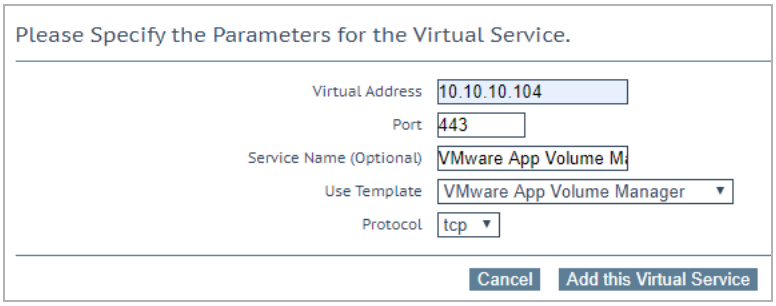
The table in each section outlines the settings configured by the application template. You can use this information to manually configure Virtual Services or use the Kemp LoadMaster Application Programming Interface (API) and automation tools.

SSL/TLS certificates should be added before creating this VS. For further information on certificates, refer to the SSL Accelerated Services Feature Description.

9.1 Create the App Volume Manager Virtual Services

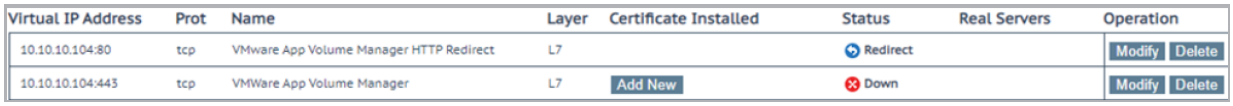
The following are the steps involved and the recommended settings to configure the VMware App Volume Manager Virtual Service:

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



2. Type a valid **Virtual Address**.
3. Select the **VMware App Volume Manager** template in the **Use Template** drop-down list.
4. Click **Add this Virtual Service**.
5. In the left-hand navigation select **View/Modify Services**.

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Virtual IP Address	Prot	Name	Layer	Certificate Installed	Status	Real Servers	Operation
10.10.10.104:80	tcp	VMware App Volume Manager HTTP Redirect	L7		Redirect		Modify Delete
10.10.10.104:443	tcp	VMWare App Volume Manager	L7	Add New	Down		Modify Delete

6. Click **Modify** on the Virtual Service on TCP port 443.
7. Expand the **SSL Properties** section.
8. Select the certificate to use from **Available Certificates** and click the arrow (>) to move it to **Assigned Certificates**.
9. Expand the **Real Servers** section.
10. Click **Add New**.
11. Type the **Real Server Address**.
12. Confirm that port **443** is entered.
13. Click **Add This Real Server**.
14. Repeat this step to add more Real Servers as needed.

9.1.1 App Volume Manager Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	443
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
Persist	src
PersistTimeout	3600

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API Parameter	API Value
CheckType	https
Checkurl	/
CheckUseGet	1

9.1.2 App Volume Manager Redirect Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	80
prot	tcp
VStype	http
Forcel7	1
Transparent	0
ErrorCode	302
ErrorUrl	https://%h%s
CheckType	None

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10 Workspace One Access

The VMware Workspace One Access provides several functions in relation to the Horizon 7 and Horizon 8 implementation such as a portal where users gain access to different types of applications including SaaS-based, enterprise identity management to sync and extend Active Directory, and single sign on. There is also a self-service app store that enables users to search and select applications in a simple way.

This step-by-step setup of VSs leverages the Kemp application template for Horizon 7 and Horizon 8.

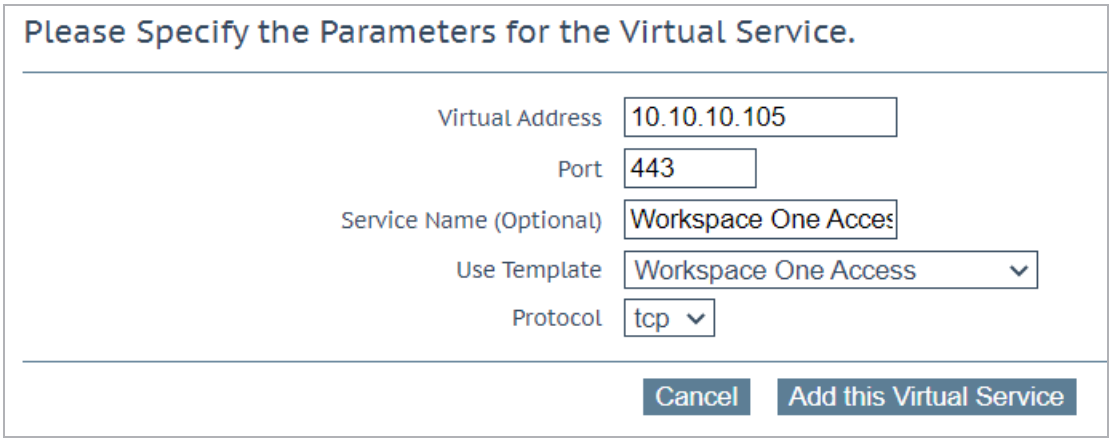
The table in each section outlines the settings configured by the application template. You can use this information to manually configure Virtual Services or use the Kemp LoadMaster Application Programming Interface (API) and automation tools.

SSL/TLS certificates should be added before creating this VS. For further information on certificates, refer to the SSL Accelerated Services Feature Description.

10.1 Create the Workspace One Access Virtual Services

The following are the steps involved and the recommended settings to configure the VMware Workspace One Access Virtual Service:

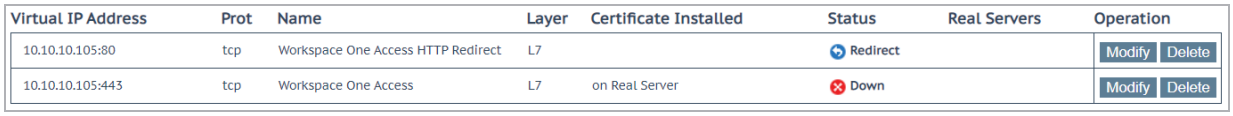
1. In the main menu of the LoadMaster Web User Interface (WUI), go to **Virtual Services > Add New**.



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

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3. Select the **Workspace One Access** template from the **Use Template** drop-down list.
4. Click **Add this Virtual Service**.
5. In the left-hand navigation select **View/Modify Services**.



6. Click **Modify** on the Virtual Service on TCP port 443.
7. Expand the **Real Servers** section.
8. Click **Add New**.
9. Type the **Real Server Address**.
10. Confirm that port **443** is entered.
11. Click **Add This Real Server**.
12. Repeat this step to add more Real Servers as needed.

10.1.1 Workspace One Access Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	443
prot	tcp
VStype	http
SubnetOriginating	1
Forcel7	1
Transparent	0
Schedule	lc
Persist	src
PersistTimeout	3600

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API Parameter	API Value
CheckType	https
Checkurl	/
CheckUseGet	1

10.1.2 Workspace One Access Redirect Virtual Service Recommended API Settings (optional)

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

API Parameter	API Value
port	80
prot	tcp
VStype	http
Forcel7	1
Transparent	0
ErrorCode	302
ErrorUrl	https://%h%s
CheckType	None

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