Progress®
Kemp® LoadMaster®

# Deployment Guide Progress DataDirect Hybrid Data Pipeline

Generated on: 10 March 2025

# Copyright

**Visit the following page online to see Progress Software Corporation's current Product Documentation Copyright Notice/Trademark Legend:** Product Documentation Copyright Notice & Trademarks | Progress

# Table of Contents


**Chapter 1: Introduction . . . . . 5**

Document Purpose . . . . . 5

Intended Audience . . . . . 5

**Chapter 2: Template . . . . . 7**

**Chapter 3: Architecture . . . . . 8**

**Chapter 4: Configure the LoadMaster . . . . . 10**

Enable Subnet Originating Requests Globally . . . . . 10

**Chapter 5: Virtual Services . . . . . 12**

Create the DataDirect Hybrid Data Pipeline – HTTPS Offloaded Virtual Service . . . . . 12

Modify the DataDirect Hybrid Data Pipeline Default Sub Virtual Service . . . . . 13

Modify the DataDirect Hybrid Data Pipeline Notification Sub Virtual Service . . . . . 14

Modify the DataDirect Hybrid Data Pipeline OPA – Node 1 Sub Virtual Service . . . . . 14

Modify the DataDirect Hybrid Data Pipeline OPA – Node 2 Sub Virtual Service . . . . . 15

Modify the DataDirect Hybrid Data Pipeline OPA Content Rules . . . . . 15

DataDirect Hybrid Data Pipeline HTTPS Offloaded Virtual Service Recommended Settings (optional) . . . . . 15

Create the DataDirect Hybrid Data Pipeline – HTTPS Reencrypt Virtual Service . . . . . 18

Modify the DataDirect Hybrid Data Pipeline Default Sub Virtual Service . . . . . 19

Modify the DataDirect Hybrid Data Pipeline Notification Sub Virtual Service . . . . . 20

Modify the DataDirect Hybrid Data Pipeline OPA – Node 1 Sub Virtual Service . . . . . 20

Modify the DataDirect Hybrid Data Pipeline OPA – Node 2 Sub Virtual Service . . . . . 20
Modify the DataDirect Hybrid Data Pipeline OPA Content Rules . . . . . 21
DataDirect Hybrid Data Pipeline HTTPS Reencrypt Virtual Service Recommended Settings (optional). . . . . 21

# 1

# Introduction

Progress DataDirect® Hybrid Data Pipeline provides simple, secure, and scalable access to universal data connectivity.

The Progress LoadMaster delivers an exceptional, cost effective, and easy to use solution which by employing intelligent server health checking, load balancing, high availability, and security can support an always-on application experience for DataDirect Hybrid Data Pipeline.

**Related Links**

For details, see the following topics:

- Document Purpose
- Intended Audience

## Document Purpose

This document provides the recommended LoadMaster settings used when providing load balancing for DataDirect Hybrid Data Pipeline. The Progress Support team is available to provide solutions for scenarios not explicitly defined. For further details, refer to the: LoadMaster Support and Learning Hub.

## Intended Audience

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

DataDirect Hybrid Data Pipeline.

# 2

# Template

Progress 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.

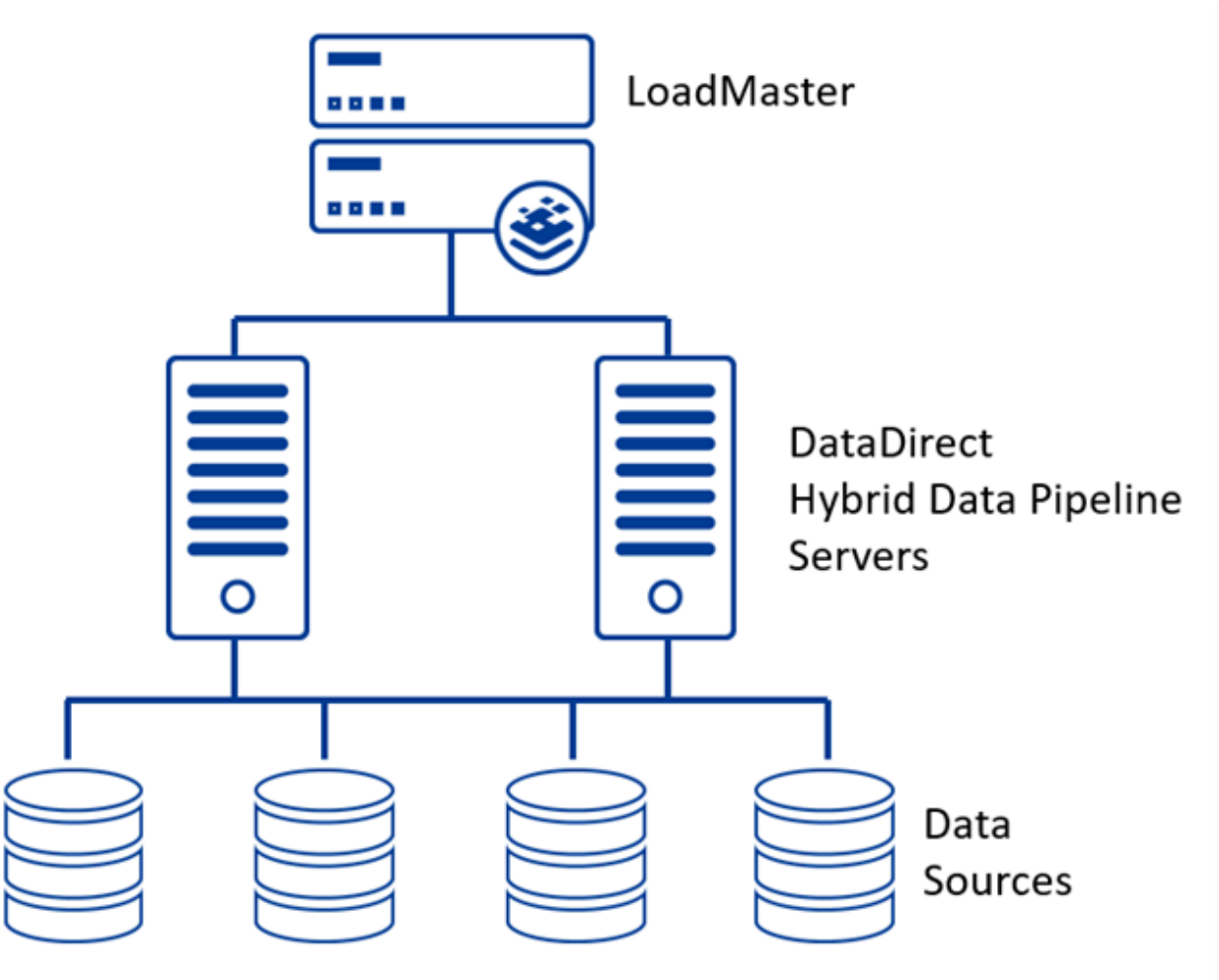
Download released templates from the following page: LoadMaster Templates.

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

# 3

# Architecture

Progress DataDirect deployments consist of multiple servers running Hybrid Data Pipeline behind a load balancer.


LoadMaster
DataDirect
Hybrid Data Pipeline
Servers
Data
Sources

# 4

# Configure the LoadMaster

Refer to the sections below for details on some recommended global settings.

**Related Links**

For details, see the following topics:

- Enable Subnet Originating Requests Globally

# 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.

# 5

# Virtual Services

This step-by-step setup of Virtual Services (VSs) leverages the Progress Kemp application template for DataDirect Hybrid Data Pipeline. This template configures the Virtual Services to publish DataDirect with HTTP, HTTPS with TLS/SSL Offloading or HTTPS with TLS/SSL Reecryption.

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 Progress LoadMaster Application Programming Interface (API) and automation tools.

**Related Links**

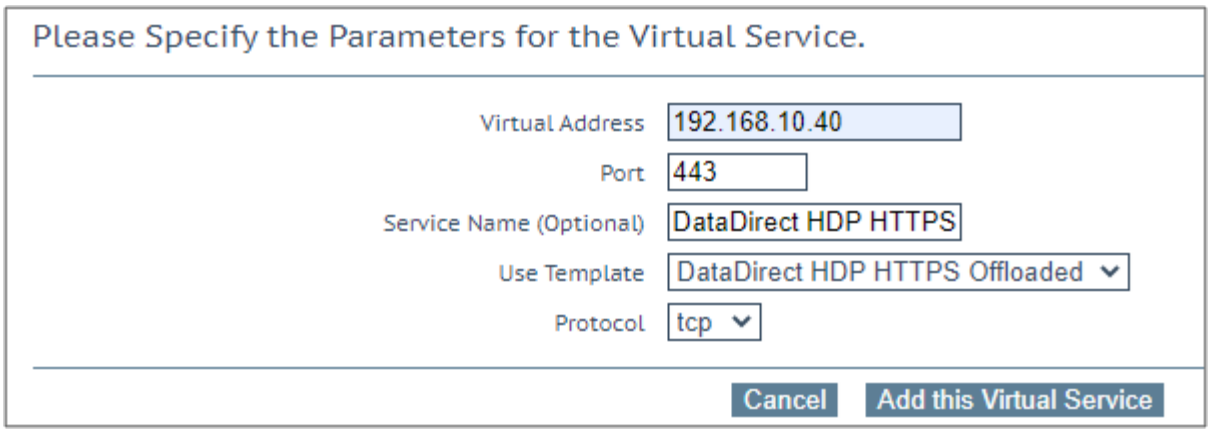
For details, see the following topics:

- Create the DataDirect Hybrid Data Pipeline – HTTPS Offloaded Virtual Service
- Create the DataDirect Hybrid Data Pipeline – HTTPS Reencrypt Virtual Service

## Create the DataDirect Hybrid Data Pipeline – HTTPS Offloaded Virtual Service

The following are the steps involved and the recommended settings to configure the DataDirect Hybrid Data Pipeline HTTPS Offloaded Virtual Service.

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




2. Type a valid **Virtual Address**.
3. Select the **DataDirect HDP HTTPS Offloaded** template in the **Use Template** drop-down list.
4. Click **Add this Virtual Service**.

# Modify the DataDirect Hybrid Data Pipeline Default Sub Virtual Service

1. Click **Virtual Services** and **View/Modify Services**.
2. Click **Modify** on the **DataDirect HDP HTTPS Offloaded** Virtual Service on port 443.
3. Expand the **SSL Properties** section.
4. Select the certificate to use from **Available Certificates** and click the arrow (>) to move it to **Assigned Certificates**.
5. Expand the **SubVSs** section.
6. Click **Modify** for the **HDP Offloaded Default** Sub Virtual Service.
7. Expand the **Real Servers** section.
8. Click **Add New**.
9. Type the **Real Server Address**.
10. Enter **8080** for the **Port**.
11. Click **Add This Real Server**.
12. Repeat these steps to add more Real Servers as needed.

## Modify the DataDirect Hybrid Data Pipeline Notification Sub Virtual Service

## Modify the DataDirect Hybrid Data Pipeline Notification Sub Virtual Service

1. Click **Virtual Services** and **View/Modify Services**.
2. Click **Modify** on the **DataDirect HDP HTTPS Offloaded** Virtual Service on port 443.
3. Expand the **SubVSs** section.
4. Click Modify for the **HDP Offloaded Notification** Sub Virtual Service.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Address**.
8. Enter **11280** for the **Port**.
9. Click **Add This Real Server**.
10. Repeat these steps to add more Real Servers as needed.

## Modify the DataDirect Hybrid Data Pipeline OPA – Node 1 Sub Virtual Service

1. Click **Virtual Services** and **View/Modify Services**.
2. Click **Modify** on the **DataDirect HDP HTTPS Offloaded** Virtual Service on port 443.
3. Expand the **SubVSs** section.
4. Click Modify for the **HDP Offloaded OPA Node 1** Sub Virtual Service.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Address**.
8. Enter **40501** for the **Port**.
9. Click **Add This Real Server**.

# Modify the DataDirect Hybrid Data Pipeline OPA – Node 2 Sub Virtual Service

1. Click **Virtual Services** and **View/Modify Services**.
2. Click **Modify** on the **DataDirect HDP HTTPS Offloaded** Virtual Service on port 443.
3. Expand the **SubVSs** section.
4. Click **Modify** for the **HDP Offloaded OPA Node 2** Sub Virtual Service.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Address** for the second DatatDirect Hybrid Data Pipeline Server.
8. Enter **40501** for the **Port**.
9. Click **Add This Real Server**.
10. Repeat these steps to add more Real Servers as needed.

**Note:** Additional OPA Sub Virtual Services can be created if more than two servers are in the environment.

# Modify the DataDirect Hybrid Data Pipeline OPA Content Rules

Content Rules are created to direct traffic based on the path of the URL. The OPA Content Rules have unique paths for each environment and must be modified.

1. Click **Rules and Checking** and **Content Rules**.
2. Click **Modify** on the **opa_Node1_xxxxx** Content Rule.
3. Change the **ADD_NODE_SERVER_IP** to the unique path for the OPA Node 1 server.
4. Click **Modify Rule** to apply changes.
5. Repeat steps for remaining OPA Content Rules.

# DataDirect Hybrid Data Pipeline HTTPS Offloaded Virtual Service Recommended Settings (optional)

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

| API Parameter | API Value | WUI Field Name | WUI Field Value |
|---|---|---|---|
| **Root Virtual Service** | | | |
| port | 443 | Port | 443 |
| prot | tcp | Protocol | tcp |
| VStype | http | Service Type | HTTP-HTTP/2-HTTPS |
| Schedule | lc | Scheduling Method | least connection |
| Persist | none | Persistence Options | None |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |
| Forcel7 | 1 | Force L4 | Disabled |
| SSLAcceleration | 1 | SSL Acceleration | Enabled |
| TLSType | 3 | Supported Protocols | TLS1.1, TLS1.2, and TLS1.3 (Enabled) |
| CipherSet | BestPractices | Cipher Set | BestPractices |
| **HDP Offloaded Default - Sub Virtual Service** | | | |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |
| Schedule | lc | Scheduling Method | least connection |
| Persist | src | Persistence Options | Source IP Address |

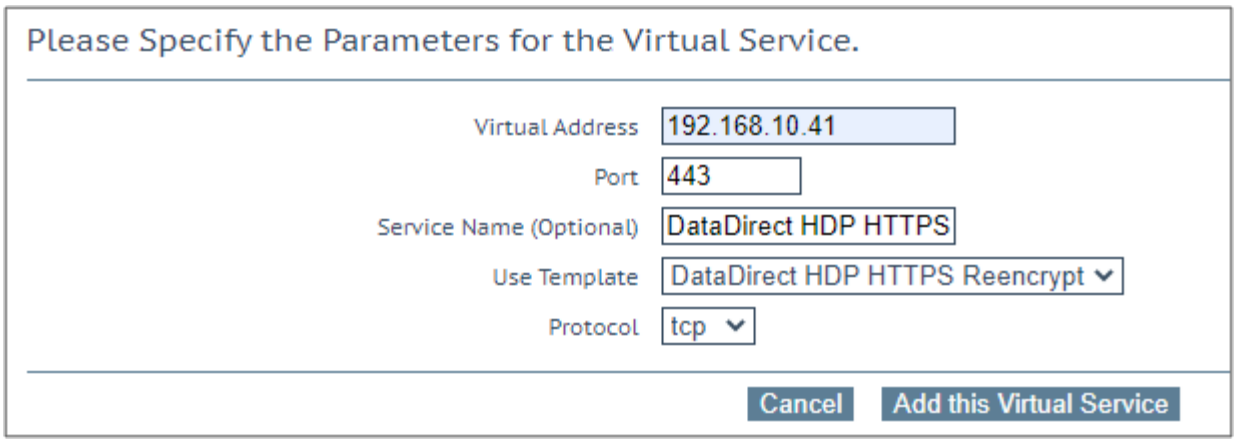
| API Parameter | API Value | WUI Field Name | WUI Field Value |
|---|---|---|---|
| PersistTimeOut | 300 | Timeout | 5 Minutes |
| CheckType | http | Real Server Check Method | HTTPS Protocol |
| CheckUseGet | 0 | HTTP Method | HEAD |
| CheckPort | 8080 | Checked Port | 8080 |
| CheckUrl | /api/healthcheck | URL | /api/healthcheck |
| **HDP Offloaded Notification - Sub Virtual Service** | | | |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |
| Schedule | lc | Scheduling Method | least connection |
| Persist | src | Persistence Options | Source IP Address |
| PersistTimeOut | 300 | Timeout | 5 Minutes |
| CheckType | http | Real Server Check Method | HTTP Protocol |
| CheckUseGet | 0 | HTTP Method | HEAD |
| CheckPort | 11280 | Checked Port | 11280 |
| **HDP Offloaded OPA Node 1 - Sub Virtual Service** | | | |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |

| API Parameter | API Value | WUI Field Name | WUI Field Value |
|---|---|---|---|
| Schedule | lc | Scheduling Method | least connection |
| CheckType | http | Real Server Check Method | HTTP Protocol |
| CheckUseGet | 0 | HTTP Method | HEAD |
| CheckPort | 40501 | Checked Port | 40501 |
| **HDP Offloaded OPA Node 2 - Sub Virtual Service** | | | |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |
| Schedule | lc | Scheduling Method | least connection |
| CheckType | http | Real Server Check Method | HTTP Protocol |
| CheckUseGet | 0 | HTTP Method | HEAD |
| CheckPort | 40501 | Checked Port | 40501 |

# Create the DataDirect Hybrid Data Pipeline – HTTPS Reencrypt Virtual Service

The following are the steps involved and the recommended settings to configure the DataDirect Hybrid Data Pipeline HTTPS Reencrypt Virtual Service.

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




2. Type a valid **Virtual Address**.
3. Select the **DataDirect HDP HTTPS Reencrypt** template in the **Use Template** drop-down list.
4. Click **Add this Virtual Service**.

## Modify the DataDirect Hybrid Data Pipeline Default Sub Virtual Service

1. Click **Virtual Services** and **View/Modify Services**.
2. Click **Modify** on the **DataDirect HDP HTTPS Reencrypt** Virtual Service on port 443.
3. Expand the **SSL Properties** section.
4. Select the certificate to use from **Available Certificates** and click the arrow (>) to move it to **Assigned Certificates**.
5. Expand the **SubVSs** section.
6. Click **Modify** for the **HDP Reencrypt Default** Sub Virtual Service.
7. Expand the **Real Servers** section.
8. Click **Add New**.
9. Type the **Real Server Address**.
10. Enter **8443** for the **Port**.
11. Click **Add This Real Server**.
12. Repeat these steps to add more Real Servers as needed.

## Modify the DataDirect Hybrid Data Pipeline Notification Sub Virtual Service

1. Click **Virtual Services** and **View/Modify Services**.
2. Click **Modify** on the **DataDirect HDP HTTPS Reencrypt** Virtual Service on port 443.
3. Expand the **SubVSs** section.
4. Click Modify for the **HDP Reencrypt Notification** Sub Virtual Service.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Address**.
8. Enter **11443** for the **Port**.
9. Click **Add This Real Server**.
10. Repeat these steps to add more Real Servers as needed.

## Modify the DataDirect Hybrid Data Pipeline OPA – Node 1 Sub Virtual Service

1. Click **Virtual Services** and **View/Modify Services**.
2. Click **Modify** on the **DataDirect HDP HTTPS Reencrypt** Virtual Service on port 443.
3. Expand the **SubVSs** section.
4. Click Modify for the **HDP Reencrypt OPA Node 1** Sub Virtual Service.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Address** for the first DataDirect Hybrid Data Pipeline Server.
8. Enter **40501** for the **Port**.
9. Click **Add This Real Server**.

## Modify the DataDirect Hybrid Data Pipeline OPA – Node 2 Sub Virtual Service

1. Click **Virtual Services** and **View/Modify Services**.
2. Click **Modify** on the **DataDirect HDP HTTPS Reencrypt** Virtual Service on port 443.

3. Expand the **SubVSs** section.
4. Click **Modify** for the **HDP Reencrypt OPA Node 2** Sub Virtual Service.
5. Expand the **Real Servers** section.
6. Click **Add New**.
7. Type the **Real Server Address** for the second DataDirect Hybrid Data Pipeline Server.
8. Enter **40501** for the **Port**.
9. Click **Add This Real Server**.
10. Repeat these steps to add more Real Servers as needed.

**Note:** Additional OPA Sub Virtual Services can be created if more than two servers are in the environment.

# Modify the DataDirect Hybrid Data Pipeline OPA Content Rules

Content Rules are created to direct traffic based on the path of the URL. The OPA Content Rules have unique paths for each environment and must be modified.

1. Click **Rules and Checking** and **Content Rules**.
2. Click **Modify** on the **opa_node1_xxxxx** Content Rule.
3. Change the **ADD_NODE_SERVER_IP** to the unique path for the OPA Node 1 server.
4. Click **Modify Rule** to apply changes.
5. Repeat steps for remaining OPA Content Rules.

# DataDirect Hybrid Data Pipeline HTTPS Reencrypt Virtual Service Recommended Settings (optional)

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

| API Parameter | API Value | WUI Field Name | WUI Field Value |
|---|---|---|---|
| **Root Virtual Service** | | | |
| port | 443 | Port | 443 |

| API Parameter | API Value | WUI Field Name | WUI Field Value |
|---|---|---|---|
| prot | tcp | Protocol | tcp |
| VStype | http | Service Type | HTTP-HTTP/2-HTTPS |
| Schedule | lc | Scheduling Method | least connection |
| Persist | none | Persistence Options | None |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |
| Forcel7 | 1 | Force L4 | Disabled |
| SSLAcceleration | 1 | SSL Acceleration | Enabled |
| SSLReencrypt | 1 | Reencrypt | Enabled |
| TLSType | 3 | Supported Protocols | TLS1.1, TLS1.2, and TLS1.3 (Enabled) |
| CipherSet | BestPractices | Cipher Set | BestPractices |
| **HDP Reencrypt Default - Sub Virtual Service** | | | |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |
| Schedule | lc | Scheduling Method | least connection |
| Persist | src | Persistence Options | Source IP Address |
| PersistTimeOut | 300 | Timeout | 5 Minutes |

| API Parameter | API Value | WUI Field Name | WUI Field Value |
|---|---|---|---|
| CheckType | https | Real Server Check Method | HTTPS Protocol |
| CheckUseGet | 0 | HTTP Method | HEAD |
| CheckPort | 8443 | Checked Port | 8443 |
| CheckUrl | /api/healthcheck | URL | /api/healthcheck |
| HDP Reencrypt Notification - Sub Virtual Service | | | |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |
| Schedule | lc | Scheduling Method | least connection |
| Persist | src | Persistence Options | Source IP Address |
| PersistTimeOut | 300 | Timeout | 5 Minutes |
| CheckType | https | Real Server Check Method | HTTPS Protocol |
| CheckUseGet | 0 | HTTP Method | HEAD |
| CheckPort | 11443 | Checked Port | 11443 |
| HDP Reencrypt OPA Node 1 - Sub Virtual Service | | | |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |
| Schedule | lc | Scheduling Method | least connection |

| API Parameter | API Value | WUI Field Name | WUI Field Value |
|---|---|---|---|
| CheckType | https | Real Server Check Method | HTTPS Protocol |
| CheckUseGet | 0 | HTTP Method | HEAD |
| CheckPort | 40501 | Checked Port | 40501 |
| HDP Reencrypt OPA Node 2 - Sub Virtual Service | | | |
| SubnetOriginating | 1 | Subnet Originating Requests | Enabled |
| Schedule | lc | Scheduling Method | least connection |
| CheckType | https | Real Server Check Method | HTTPS Protocol |
| CheckUseGet | 0 | HTTP Method | HEAD |
| CheckPort | 40501 | Checked Port | 40501 |