

Load Balancing Sectra Medical Systems

Version 1.0.0



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1. About this Guide

This guide details the steps required to configure a load balanced Sectra medical systems environment utilizing Loadbalancer.org appliances. It covers the configuration of the load balancers and also any Sectra configuration changes that are required to enable load balancing.

For more information about initial appliance deployment, network configuration and using the Web User Interface (WebUI), please also refer to the Administration Manual.

2. Loadbalancer.org Appliances Supported

All our products can be used with Sectra medical systems. For full specifications of available models please refer to https://www.loadbalancer.org/products.

Some features may not be supported in all cloud platforms due to platform specific limitations, please check with Loadbalancer.org support for further details.

3. Software Versions Supported

3.1. Loadbalancer.org Appliance

V8.7.0 and later

f Note

The screenshots used throughout this document aim to track the latest Loadbalancer.org software version. If using an older software version, note that the screenshots presented here may not match the WebUI exactly.

3.2. Sectra Medical Systems

• Sectra software version 21.2 (September 2019) and later

4. Sectra Medical Systems

Sectra provide a suite of different medical systems covering a wide array of modern medical imaging and eHealth needs.

Sectra Radiology PACS is a picture archiving and communications system (PACS) suite which provides an integrated DICOM-compliant radiology information system (RIS) in certain markets. Its backend is referred to as Sectra Healthcare Server (SHS), the core application providing PACS and database functionality. The viewer service is referred to as IDS7, a secure Microsoft Windows-compatible DICOM image viewer component which supports Microsoft Edge and Internet Explorer.

Sectra UniView is an integrated web application for medical image viewing combined with imported electronic medical record (EMR) data. It allows for viewing images across multiple PACS platforms, including via the IDS7 viewer.

Sectra Digital Pathology Solution is an integrated application for histopathology and cytopathology image review



which connects with radiology PACS and RIS, including from other vendors.

There is a high availability (HA) load balancing requirement for the Sectra applications due to their mission-critical nature in healthcare settings. The volume of traffic received by Sectra PACS, UniView, and Pathology Server in a busy clinical environment can exceed the availability provided by a single real server. Additionally, having multiple real servers allows for redundancy in the event of a server issue, either with the host itself or the Sectra application that is installed. It has been observed that Sectra PACS performs substantially better in a load balanced configuration.

5. Load Balancing Sectra Medical Systems

8 Note

It's highly recommended that you have a working Sectra medical systems environment first before implementing the load balancer.

5.1. Persistence (aka Server Affinity)

The Sectra IDS7 viewer service is stateless and does not require session affinity at the load balancing layer.

Sectra UniView traffic uses cookie-based persistence to ensure that clients stick to the same UniView server for the duration of their session.

Sectra Pathology Server traffic uses query string parameter-based persistence to stick clients to the same pathology server.

5.2. Virtual Service (VIP) Requirements

To provide load balancing and HA for Sectra medical systems, the following VIPs are usually required, depending on which elements of Sectra's medical systems are in use:

- IDS7 HTTP
- IDS7 HTTPS
- UniView HTTP
- UniView HTTPS
- Pathology HTTP
- Pathology HTTPS

5.3. Port Requirements

The following table shows the ports that are load balanced:

Port	Protocols	Use
80	TCP/HTTP	Sectra Healthcare Server (SHS), UniView, IDS7, and Sectra Digital Pathology Solution Traffic (HTTP)

Port	Protocols	Use
443		Sectra Healthcare Server (SHS), UniView, IDS7, and Sectra Digital
		Pathology Solution Traffic (HTTPS)

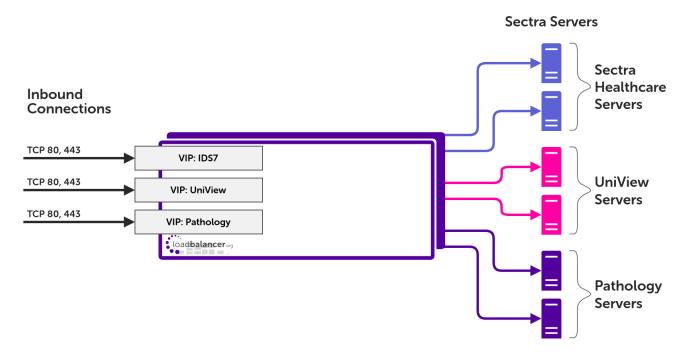
5.4. TLS/SSL Termination

The Sectra IDS7, UniView, and pathology services all require TLS termination to be performed. Some traffic requires modification of HTTP headers and some services require the use of application-layer persistence methods, which necessitates the use of TLS termination.

5.5. Health Checks

Load balancing Sectra medical services is unusual in that each of the three services require custom health checking to function correctly. As such, before defining the virtual services, it is necessary to create custom health checks for the Sectra services that will be load balanced. This process is detailed in Section 8.1, "Creating the Custom Health Checks".

6. Deployment Concept



VIPs = Virtual IP Addresses

8 Note

The load balancer can be deployed as a single unit, although Loadbalancer.org recommends a clustered pair for resilience & high availability. Please refer to the section Configuring HA - Adding a Secondary Appliance in the appendix for more details on configuring a clustered pair.

7. Loadbalancer.org Appliance – the Basics

7.1. Virtual Appliance



A fully featured, fully supported 30 day trial is available if you are conducting a PoC (Proof of Concept) deployment. The VA is currently available for VMware, Virtual Box, Hyper-V, KVM, XEN and Nutanix AHV and has been optimized for each Hypervisor. By default, the VA is allocated 2 vCPUs, 4GB of RAM and has a 20GB virtual disk. The Virtual Appliance can be downloaded here.

8 Note	The same download is used for the licensed product, the only difference is that a license key file (supplied by our sales team when the product is purchased) must be applied using the appliance's WebUI.
8 Note	Please refer to Virtual Appliance Installation and the ReadMe.txt text file included in the VA download for additional information on deploying the VA using the various Hypervisors.
8 Note	The VA has 4 network adapters. For VMware only the first adapter (eth0) is connected by default. For HyperV, KVM, XEN and Nutanix AHV all adapters are disconnected by default. Use the network configuration screen within the Hypervisor to connect the required adapters.

7.2. Initial Network Configuration

After boot up, follow the instructions on the appliance console to configure the management IP address, subnet mask, default gateway, DNS Server and other network settings.

(!) Important Be sure to set a secure password for the load balancer, when prompted during the setup routine.

7.3. Accessing the Appliance WebUI

The WebUI is accessed using a web browser. By default, users are authenticated using Apache authentication. Users can also be authenticated against LDAP, LDAPS, Active Directory or Radius - for more information, please refer to External Authentication.

8 Note	There are certain differences when accessing the WebUI for the cloud appliances. For details, please refer to the relevant Quick Start / Configuration Guide.
8 Note	A number of compatibility issues have been found with various versions of Microsoft Internet Explorer and Edge. The WebUI has been tested and verified using both Chrome & Firefox.

1. Using a browser, navigate to the following URL:

https://<IP-address-configured-during-the-network-setup-wizard>:9443/lbadmin/

You'll receive a warning about the WebUl's certificate. This is due to the default self signed certificate that is used. If preferred, you can upload your own certificate - for more information, please refer to Appliance Security Features.

2. Log in to the WebUI using the following credentials:



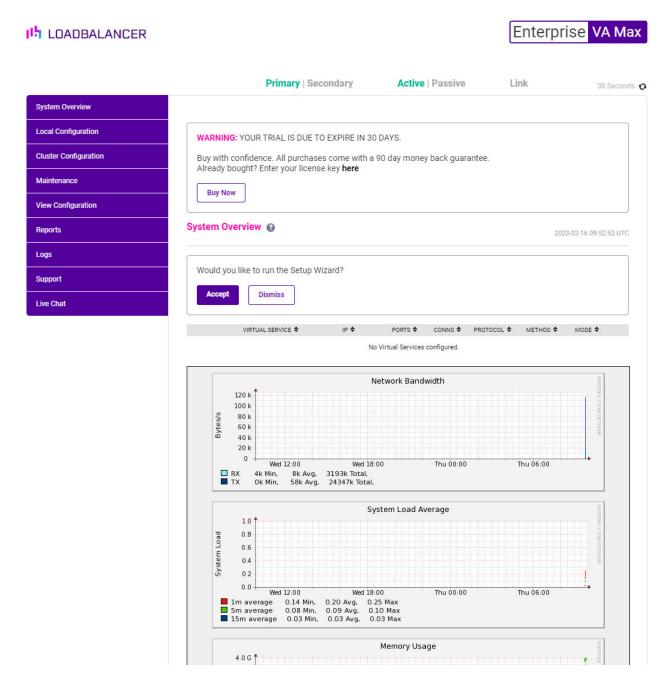
Username: loadbalancer

Password: <configured-during-network-setup-wizard>

8 Note

To change the password, use the WebUI menu option: *Maintenance > Passwords*.

Once logged in, the WebUI will be displayed as shown below:



3. You'll be asked if you want to run the Setup Wizard. Click **Dismiss** if you're following a guide or want to configure the appliance manually. Click **Accept** to start the Setup Wizard.

8 Note

The Setup Wizard can only be used to configure Layer 7 services.

Main Menu Options



System Overview - Displays a graphical summary of all VIPs, RIPs and key appliance statistics

Local Configuration - Configure local host settings such as IP address, DNS, system time etc.

Cluster Configuration - Configure load balanced services such as VIPs & RIPs

Maintenance - Perform maintenance tasks such as service restarts and taking backups

View Configuration - Display the saved appliance configuration settings

Reports - View various appliance reports & graphs

Logs - View various appliance logs

Support - Create a support download, contact the support team & access useful links

Live Chat - Start a live chat session with one of our Support Engineers

7.4. Appliance Software Update

To ensure that the appliance(s) are running the latest software version, we recommend a software update check is performed.

Determining the Current Software Version

The software version is displayed at the bottom of the WebUI as shown in the example below:

Copyright © Loadbalancer.org Inc. 2002 – 2023 ENTERPRISE VA Max - v8.9.0



Checking for Updates using Online Update

8 Note

By default, the appliance periodically contacts the Loadbalancer.org update server and checks for updates. An update check can also be manually triggered as detailed below.

- 1. Using the WebUI, navigate to: *Maintenance > Software Update*.
- 2. Select Online Update.
- 3. If the latest version is already installed, a message similar to the following will be displayed:

Information: Version v8.9.0 is the current release. No updates are available

- 4. If an update is available, you'll be presented with a list of new features, improvements, bug fixes and security related updates.
- 5. Click **Online Update** to start the update process.
 - Note Do not navigate away whilst the update is ongoing, this may cause the update to fail.
- 6. Once complete (the update can take several minutes depending on download speed and upgrade version) the following message will be displayed:

Information: Update completed successfully.

7. If services need to be reloaded/restarted or the appliance needs a full restart, you'll be prompted accordingly.

Using Offline Update

If the load balancer does not have access to the Internet, offline update can be used.

8 Note

Please contact support@loadbalancer.org to check if an update is available and obtain the latest offline update files.

To perform an offline update:

- 1. Using the WebUI, navigate to: Maintenance > Software Update.
- 2. Select Offline Update.
- 3. The following screen will be displayed:

Software Update

Offline Update

The following steps will lead you through offline update.

- 1. Contact Loadbalancer.org support to obtain the offline update archive and checksum.
- 2. Save the archive and checksum to your local machine.
- 3. Select the archive and checksum files in the upload form below.
- 4. Click Upload and Install to begin the update process.

Archive: Choose File No file chosen
Checksum: Choose File No file chosen
Upload and Install

- 4. Select the Archive and Checksum files.
- 5. Click Upload and Install.
- 6. If services need to be reloaded/restarted or the appliance needs a full restart, you'll be prompted accordingly.

7.5. Ports Used by the Appliance

By default, the appliance uses the following TCP & UDP ports:

Protocol	Port	Purpose
TCP	22	SSH
TCP & UDP	53	DNS
TCP & UDP	123	NTP



Protocol	Port	Purpose
TCP & UDP	161	SNMP
UDP	6694	Heartbeat between Primary & Secondary appliances in HA mode
TCP	7778	HAProxy persistence table replication
TCP	9080	WebUI - HTTP (disabled by default)
TCP	9081	Nginx fallback page
TCP	9443	WebUI - HTTPS

7.6. HA Clustered Pair Configuration

Loadbalancer.org recommend that load balancer appliances are deployed in pairs for high availability. In this guide a single unit is deployed first, adding a secondary unit is covered in the section Configuring HA - Adding a Secondary Appliance of the appendix.

8. Appliance Configuration for Sectra Medical Systems

8.1. Creating the Custom Health Checks

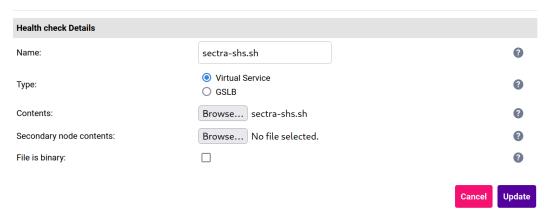
Before defining any load balanced virtual services, it is necessary to create a custom health check for each of the Sectra services that will be load balanced.

Note that **the health check naming convention is important**. The health check names **must** match the service names. This is because the health checks refer to their filenames in order to automatically configure themselves for the Sectra service being interrogated, i.e. the IDS7, UniView, or pathology service.

- Download the custom Sectra health check script from the following location: https://downloads.loadbalancer.org/sectra/sectra-multi-hc.sh
- 2. Create three copies of the health check script.
- 3. Name the health check scripts as follows:
 - sectra-shs.sh
 - sectra-uniview.sh
 - sectra-pathology.sh
- Using the load balancer's web UI, navigate to Cluster Configuration > Health Check Scripts and click Upload
 Existing Health Check.
- 5. On the *Contents* line click **Browse**.
- 6. Locate and select the first health check script file.
- 7. Re-use the filename as the health check name in the **Name** field, for simplicity.
- 8. Click **Update** to upload and add the new health check.
- 9. Upload the remaining health check files.



Health Checks - Upload Script



Full reference on uploading custom health check files can be found in the Administration Manual.

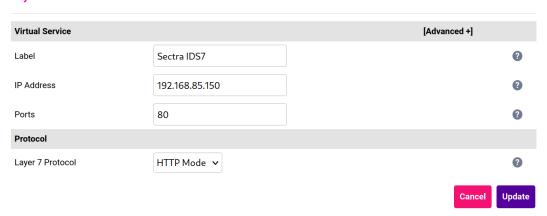
8.2. Configuring VIP 1 – Sectra IDS7

If the IDS7 service is in use then the following virtual service should be configured.

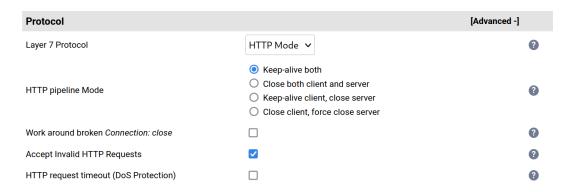
Configuring the Virtual Service (VIP)

- Using the web user interface, navigate to Cluster Configuration > Layer 7 Virtual Services and click on Add a new Virtual Service.
- 2. Define the *Label* for the virtual service as required, e.g. **Sectra IDS7**.
- 3. Set the Virtual Service IP Address field to the required IP address, e.g. 192.168.85.150.
- 4. Set the Ports field to 80.
- 5. Set the Layer 7 Protocol to HTTP Mode.
- 6. Click **Update** to create the virtual service.

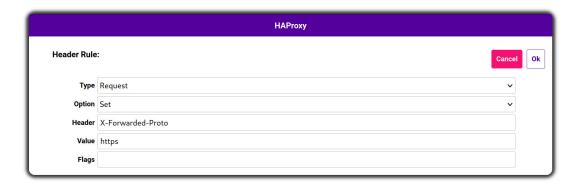
Layer 7 - Add a new Virtual Service



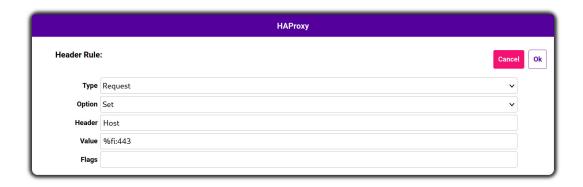
- 7. Click **Modify** next to the newly created VIP.
- 8. In the *Protocol* section click **Advanced** to expand the menu.
- 9. Check the **Accept Invalid HTTP Requests** checkbox.
- 10. Ensure that the HTTP request timeout (DoS Protection) checkbox is unchecked/disabled.



- 11. Set the Persistence Mode to None.
- 12. Set *Health Checks* to **External script**.
- 13. Set *Check Script* to **sectra-shs.sh**.
- 14. In the *Header Rules* section click **Add Rule**.
- 15. Set the *Type* to **Request**.
- 16. Set the Option to Set.
- 17. Set the *Header* to **X-Forwarded-Proto**.
- 18. Set the Value to https.
- 19. Click **Ok**.



- 20. In the Header Rules section click Add Rule.
- 21. Set the Type to Request.
- 22. Set the Option to Set.
- 23. Set the *Header* to **Host**.
- 24. Set the Value to %fi:443.
- 25. Click Ok.

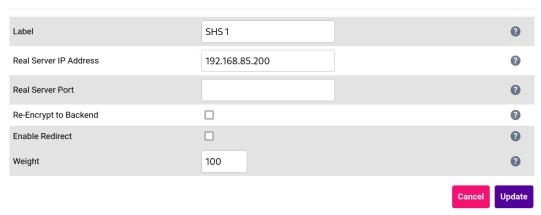


- 26. In the Other section click Advanced to expand the menu.
- 27. Set Force to HTTPS to Yes.
- 28. Set the HTTPS Redirect Code to 308 (Permanent Redirect).
- 29. Click Update.

Defining the Real Servers (RIPs)

- 1. Using the web user interface, navigate to *Cluster Configuration > Layer 7 Real Servers* and click on **Add a new Real Server** next to the newly created VIP.
- 2. Define the *Label* for the real server as required, e.g. **SHS 1**.
- 3. Set the Real Server IP Address field to the required IP address, e.g. 192.168.85.200.
- 4. Click Update.
- 5. Repeat these steps to add the remaining Sectra Healthcare Servers (SHS).

Layer 7 Add a new Real Server - Sectra_IDS7



Setting Up the TLS/SSL Termination

Uploading the Certificate

The appropriate certificate for the service in question must be uploaded to the load balancer for TLS/SSL termination to work. The process for doing this is as follows:

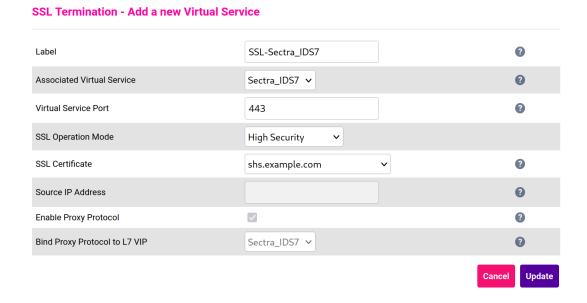
1. Using the web user interface, navigate to *Cluster Configuration > SSL Certificate* and click on **Add a new SSL Certificate**.

- 2. Press the Upload prepared PEM/PFX file radio button.
- 3. Define the *Label* for the certificate as required. It may make sense to use the domain that the certificate is associated to, e.g. **shs.example.com**.
- 4. Click on **Browse** and select the appropriate PEM or PFX style certificate.
- 5. If uploading a PFX certificate, enter the certificate's password in the PFX File Password field.
- 6. Click Upload certificate.

For more information on creating PEM certificate files and converting between certificate formats please refer to Creating a PEM File.

Creating the TLS/SSL Termination

- 1. Using the web user interface, navigate to *Cluster Configuration > SSL Termination* and click on **Add a new Virtual Service**.
- 2. From the *Associated Virtual Service* drop-down list, select the associated virtual service that was created previously, e.g. **Sectra_IDS7**.
- 3. From the *SSL Certificate* drop-down list, select the certificate for the service in question, which in this example is **shs.example.com**.
- 4. Click **Update** to create the TLS/SSL termination service.



8.3. Configuring VIP 2 - Sectra UniView

If the UniView service is in use then the following virtual service should be configured.

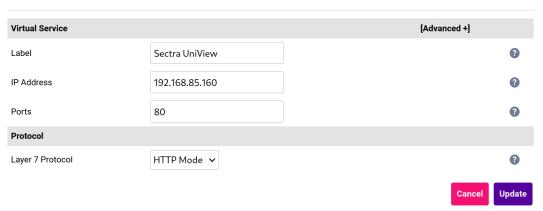
Configuring the Virtual Service (VIP)

- 1. Using the web user interface, navigate to *Cluster Configuration > Layer 7 Virtual Services* and click on **Add**a new Virtual Service
- 2. Define the Label for the virtual service as required, e.g. Sectra UniView.
- 3. Set the Virtual Service IP Address field to the required IP address, e.g. 192.168.85.160.

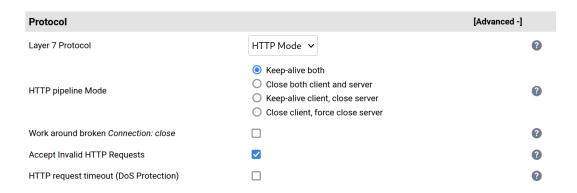


- 4. Set the Ports field to 80.
- 5. Set the Layer 7 Protocol to HTTP Mode.
- 6. Click **Update** to create the virtual service.

Layer 7 - Add a new Virtual Service



- 7. Click **Modify** next to the newly created VIP.
- 8. In the *Protocol* section click **Advanced** to expand the menu.
- 9. Check the Accept Invalid HTTP Requests checkbox.
- 10. Ensure that the HTTP request timeout (DoS Protection) checkbox is unchecked/disabled.



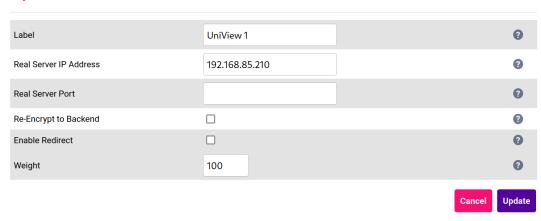
- 11. Set the Persistence Mode to HTTP Cookie.
- 12. Set *Health Checks* to **External script**.
- 13. Set *Check Script* to **sectra-uniview.sh**.
- 14. In the Other section click Advanced to expand the menu.
- 15. Set Force to HTTPS to Yes.
- 16. Set the HTTPS Redirect Code to 308 (Permanent Redirect).
- 17. Click Update.

Defining the Real Servers (RIPs)

 Using the web user interface, navigate to Cluster Configuration > Layer 7 - Real Servers and click on Add a new Real Server next to the newly created VIP.

- 2. Define the *Label* for the real server as required, e.g. **UniView 1**.
- 3. Set the Real Server IP Address field to the required IP address, e.g. 192.168.85.210.
- 4. Click Update.
- 5. Repeat these steps to add the remaining UniView servers.

Layer 7 Add a new Real Server - Sectra_UniView



Setting Up the TLS/SSL Termination

Uploading the Certificate

The appropriate certificate for the service in question must be uploaded to the load balancer for TLS/SSL termination to work. The process for doing this is as follows:

- Using the web user interface, navigate to Cluster Configuration > SSL Certificate and click on Add a new SSL Certificate.
- 2. Press the *Upload prepared PEM/PFX file* radio button.
- 3. Define the *Label* for the certificate as required. It may make sense to use the domain that the certificate is associated to, e.g. **uniview.example.com**.
- 4. Click on **Browse** and select the appropriate PEM or PFX style certificate.
- 5. If uploading a PFX certificate, enter the certificate's password in the PFX File Password field.
- 6. Click Upload certificate.

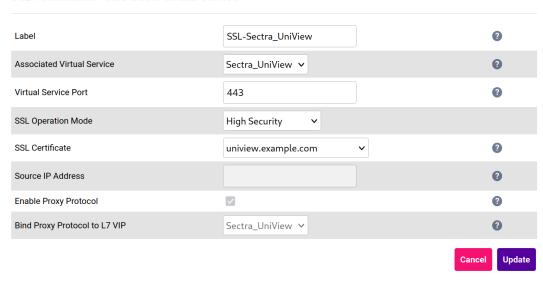
For more information on creating PEM certificate files and converting between certificate formats please refer to Creating a PEM File.

Creating the TLS/SSL Termination

- 1. Using the web user interface, navigate to *Cluster Configuration > SSL Termination* and click on **Add a new Virtual Service**.
- 2. From the *Associated Virtual Service* drop-down list, select the associated virtual service that was created previously, e.g. **Sectra_UniView**.
- 3. From the *SSL Certificate* drop-down list, select the certificate for the service in question, which in this example is **uniview.example.com**.

4. Click **Update** to create the TLS/SSL termination service.

SSL Termination - Add a new Virtual Service



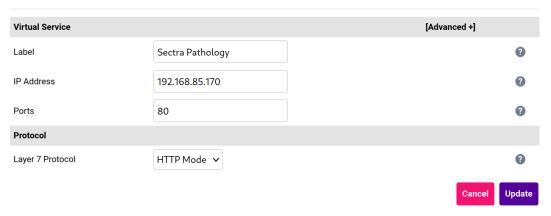
8.4. Configuring VIP 3 – Sectra Pathology

If the pathology service is in use then the following virtual service should be configured.

Configuring the Virtual Service (VIP)

- 1. Using the web user interface, navigate to *Cluster Configuration > Layer 7 Virtual Services* and click on **Add** a new Virtual Service.
- 2. Define the *Label* for the virtual service as required, e.g. **Sectra Pathology**.
- 3. Set the Virtual Service IP Address field to the required IP address, e.g. 192.168.85.170.
- 4. Set the Ports field to 80.
- 5. Set the Layer 7 Protocol to HTTP Mode.
- 6. Click **Update** to create the virtual service.

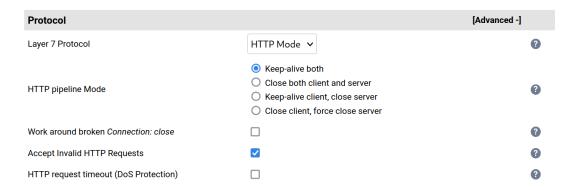
Layer 7 - Add a new Virtual Service



- 7. Click **Modify** next to the newly created VIP.
- 8. In the *Protocol* section click **Advanced** to expand the menu.



- 9. Check the Accept Invalid HTTP Requests checkbox.
- 10. Ensure that the HTTP request timeout (DoS Protection) checkbox is unchecked/disabled.



- 11. Set the **Persistence Mode** to **None**.
- 12. Set *Health Checks* to **External script**.
- 13. Set Check Script to sectra-pathology.sh.
- 14. In the ACL Rules section click Add Rule.
- 15. Set the *Type* to **Free Type**.
- 16. In the *Freetype* box, add the following two lines:

stick-table type string size 10k expire 30m stick on url_param(shardKey)



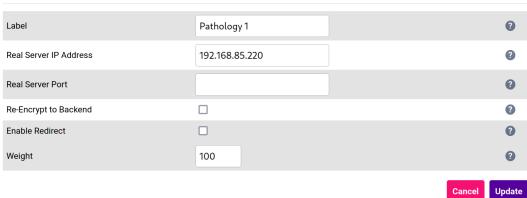
- 17. In the Other section click Advanced to expand the menu.
- 18. Set Force to HTTPS to Yes.
- 19. Set the HTTPS Redirect Code to 308 (Permanent Redirect).
- 20. Click Update.

Defining the Real Servers (RIPs)

- Using the web user interface, navigate to Cluster Configuration > Layer 7 Real Servers and click on Add a new Real Server next to the newly created VIP.
- 2. Define the *Label* for the real server as required, e.g. **Pathology 1**.
- 3. Set the Real Server IP Address field to the required IP address, e.g. 192.168.85.220.

- 4. Click Update.
- 5. Repeat these steps to add the remaining Sectra Pathology Servers (SPS).

Layer 7 Add a new Real Server - Sectra_Pathology





Setting Up the TLS/SSL Termination

Uploading the Certificate

The appropriate certificate for the service in question must be uploaded to the load balancer for TLS/SSL termination to work. The process for doing this is as follows:

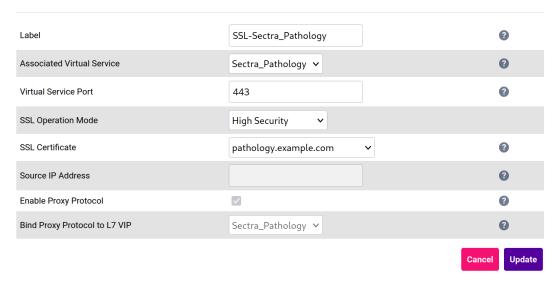
- 1. Using the web user interface, navigate to Cluster Configuration > SSL Certificate and click on Add a new SSL Certificate.
- 2. Press the *Upload prepared PEM/PFX file* radio button.
- 3. Define the Label for the certificate as required. It may make sense to use the domain that the certificate is associated to, e.g. pathology.example.com.
- 4. Click on **Browse** and select the appropriate PEM or PFX style certificate.
- 5. If uploading a PFX certificate, enter the certificate's password in the *PFX File Password* field.
- 6. Click Upload certificate.

For more information on creating PEM certificate files and converting between certificate formats please refer to Creating a PEM File.

Creating the TLS/SSL Termination

- 1. Using the web user interface, navigate to Cluster Configuration > SSL Termination and click on Add a new Virtual Service.
- 2. From the Associated Virtual Service drop-down list, select the associated virtual service that was created previously, e.g. Sectra_Pathology.
- 3. From the SSL Certificate drop-down list, select the certificate for the service in question, which in this example is pathology.example.com.
- 4. Click **Update** to create the TLS/SSL termination service.

SSL Termination - Add a new Virtual Service



8.5. Finalizing the Layer 7 Configuration

To apply the new settings, HAProxy and stunnel must be reloaded. This can be done using the button in the "Commit changes" box at the top of the screen or by using the *Restart Services* menu option:

- 1. Using the WebUI, navigate to: Maintenance > Restart Services.
- 2. Click Reload HAProxy.
- 3. Click Reload STunnel.

9. Testing & Verification

8 Note

For additional guidance on diagnosing and resolving any issues you may have, please also refer to Diagnostics & Troubleshooting.

9.1. Application Testing

To test that load balancing has been correctly configured for a deployment of Sectra medical systems, the following application tests can be carried out:

- Login test: For each Sectra application for which load balancing has been configured, test and confirm that it is possible to log in to the application. Ensure that performance is at an acceptable level.
- PACS upload test: Test that any imaging modalities are able to upload DICOM images, assuming they're communicating with Sectra PACS via the load balancer.
- Persistence test: Confirm that session persistence works as intended for the pathology and UniView services.

9.2. Using System Overview

The System Overview can be viewed in the WebUI. It shows a graphical view of all VIPs & RIPs (i.e. the various Sectra medical systems servers) and shows the state/health of each server as well as the state of the cluster as a whole. The example below shows a standard deployment where all three of the Sectra services are deployed,

and all of their respective servers are healthy and available to accept connections:



2023-09-12 16:28:13 UTC

	VIRTUAL SERVICE ♦	IP ≑	PORTS ♦	CONNS ≑	PROTOCOL ♦	METHOD	♦ MODE ♦	
1	Sectra_IDS7	192.168.85.150	80	0	НТТР	Layer 7	Proxy	9.49
	REAL SERVER	IP	PORTS	WEIGHT	CONNS			
1	SHS_1	192.168.85.200	80	100	0	Drain	Halt	9.49
1	SHS_2	192.168.85.201	80	100	0	Drain	Halt	9.41/
1	SHS_3	192.168.85.202	80	100	0	Drain	Halt	9.49
^	Sectra_UniView	192.168.85.160	80	0	НТТР	Layer 7	Proxy	NAME OF THE PERSON NAME OF THE P
	REAL SERVER	IP	PORTS	WEIGHT	CONNS			
1	UniView_1	192.168.85.210	80	100	0	Drain	Halt	9.4
1	UniView_2	192.168.85.211	80	100	0	Drain	Halt	()
Î	UniView_3	192.168.85.212	80	100	0	Drain	Halt	M
^	Sectra_Pathology	192.168.85.170	80	0	НТТР	Layer 7	Proxy	9.4
	REAL SERVER	IP	PORTS	WEIGHT	CONNS			
1	Pathology_1	192.168.85.220	80	100	0	Drain	Halt	(M
1	Pathology_2	192.168.85.221	80	100	0	Drain	Halt	()
4	Pathology_3	192.168.85.222	80	100	0	Drain	Halt	9.4

10. Technical Support

For more details about configuring the appliance and assistance with designing your deployment please don't hesitate to contact the support team using the following email address: support@loadbalancer.org.

11. Further Documentation

For additional information, please refer to the Administration Manual.

12. Appendix

12.1. Configuring HA - Adding a Secondary Appliance

Our recommended configuration is to use a clustered HA pair of load balancers to provide a highly available and resilient load balancing solution.

We recommend that the Primary appliance is configured first and then the Secondary should be added. Once the Primary and Secondary are paired, all load balanced services configured on the Primary are automatically replicated to the Secondary over the network using SSH/SCP.

8 Note

For Enterprise Azure, the HA pair should be configured first. In Azure, when creating a VIP using an HA pair, 2 private IPs must be specified – one for the VIP when it's active on the Primary and one for the VIP when it's active on the Secondary. Configuring the HA pair first, enables both IPs to be specified when the VIP is created.

The clustered HA pair uses Heartbeat to determine the state of the other appliance. Should the active device (normally the Primary) suffer a failure, the passive device (normally the Secondary) will take over.

Non-Replicated Settings

A number of settings are not replicated as part of the Primary/Secondary pairing process and therefore must be manually configured on the Secondary appliance. These are listed by WebUI menu option in the table below:

WebUI Main Menu Option	Sub Menu Option	Description		
Local Configuration	Hostname & DNS	Hostname and DNS settings		
Local Configuration	Network Interface Configuration	All network settings including IP address(es), bonding configuration and VLANs		
Local Configuration	Routing	Routing configuration including default gateways and static routes		
Local Configuration	System Date & time	All time and date related settings		
Local Configuration	Physical – Advanced Configuration	Various settings including Internet Proxy, Management Gateway, Firewall connection tracking table size, NIC offloading, SMTP relay logging and Syslog Server		
Local Configuration	Security	Appliance security settings		
Local Configuration	SNMP Configuration	Appliance SNMP settings		
Local Configuration	Graphing	Appliance graphing settings		
Local Configuration	License Key	Appliance licensing		
Maintenance	Software Updates	Appliance software update management		
Maintenance Firewall Script		Appliance firewall (iptables) configuration		
Maintenance	Firewall Lockdown Wizard	Appliance management lockdown settings		

(!) Important

Make sure that if these settings/updates have been configured on the Primary appliance, they're also configured on the Secondary appliance.

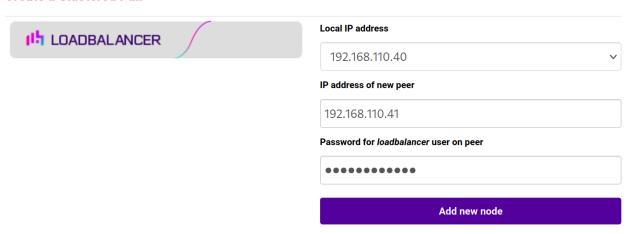
Adding a Secondary Appliance - Create an HA Clustered Pair

8 Note

If you have already run the firewall lockdown wizard on either appliance, you'll need to ensure that it is temporarily disabled on both appliances whilst performing the pairing process.

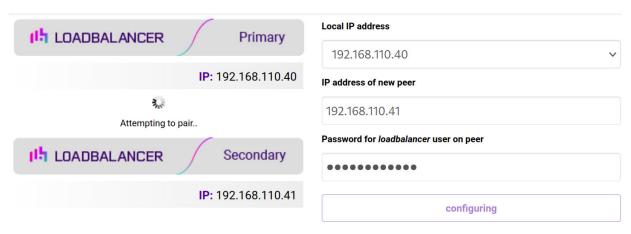
- 1. Deploy a second appliance that will be the Secondary and configure initial network settings.
- 2. Using the WebUI on the Primary appliance, navigate to: *Cluster Configuration > High-Availability Configuration*.

Create a Clustered Pair



- 3. Specify the IP address and the *loadbalancer* user's password for the Secondary (peer) appliance as shown in the example above.
- 4. Click Add new node.
- 5. The pairing process now commences as shown below:

Create a Clustered Pair



6. Once complete, the following will be displayed on the Primary appliance:



High Availability Configuration - primary



7. To finalize the configuration, restart heartbeat and any other services as prompted in the "Commit changes" message box at the top of the screen.



13. Document Revision History

Version Date		te Change		Changed By
1.0.0	13 September 2023	Initial version		NT, AH





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