Alteon and Advanced Analytics

DEMO LAB GUIDE

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Version 7.0

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GUIDE OVERVIEW

The document covers steps for demonstrating the following scenarios:

1. GSLB - global load balancing between two sites
- **Round robin load sharing –** Both sites are active.
- **Main\DR sites scenario -** Ability to failover to the remote site.

2. SSL Offloading and Layer 7 modification
    - Redirect HTTP to HTTPS.
    - Perform SSL\TLS by Alteon instead of the server.
    - Perform HTTP compression by Alteon and not by server.
    - HTTP header modification.
    - HTTP body modification.

3. Content based load balancing
    - HTTP access - server group selection based on the HTTP hostname.
    - HTTPS access - server group selection based on the SNI header.

4. HTTP/2.0 GW – Operating as HTTP2 gateway.

5. Advanced Analytics – Overview Logs and Statistics collected by Cyber controller Advanced Analytics engine. In order to provide data for this scenario, all the components of the environment are set to send HTTP and HTTPS requests.

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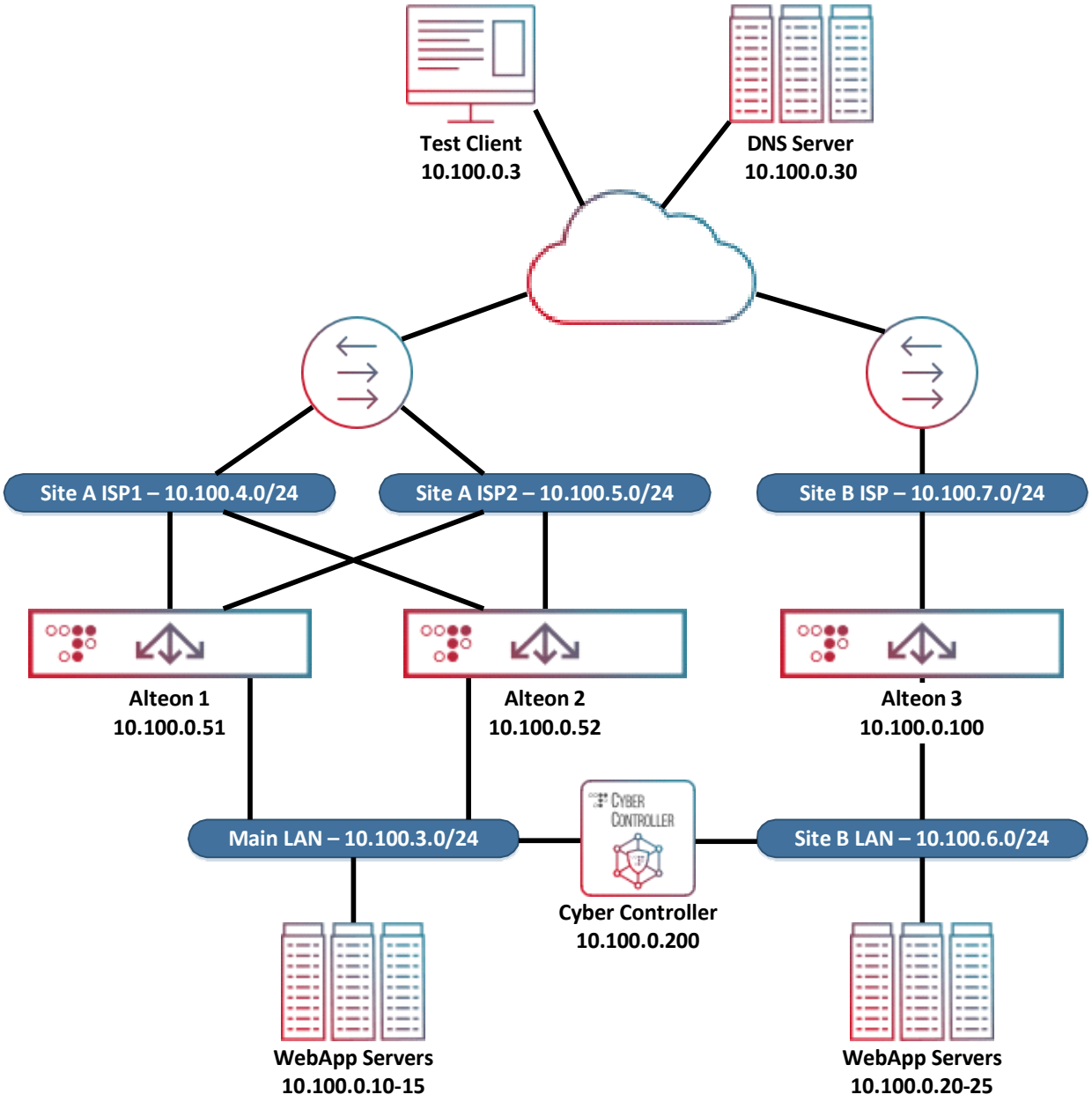
LAB TOPOLOGY



The demo lab is comprised of several components:

- Windows Client

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- DNS Server
- Two routers
- Cyber controller server
- Three Alteons for GSLB\SLB
- Two sets of web servers

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THE MANAGEMENT STATION

The windows client in the diagram is our management station, from it you run the entire demo and have access to:

- Cyber controller
- Web-App Servers
- Alteons

a.

The station is connected to three networks:

- External Network – Used for external connectivity via RDP.
- Internal Network – Used for running the demo scenarios
- Management Network – Gives us access to the management vlan.

Credentials:

- Windows Client – radware:radware
- Cyber Controller – radware:Radware1!
- Alteons – radware:Radware1!
- Web Servers – radware:radware
- DNS Server – radware:radware

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RUNNING THE DEMO

GSLB and HA Scenarios

In this section we will demonstrate global site load balancing and different HA scenarios.

Please note Main site has two links and DR site has one link:

- Site A ISP link 1 is represented by VIP 10.100.4.54
- Site A ISP link 2 is represented by VIP 10.100.5.54
- Site B ISP link is represented by VIP 10.100.7.103

Note:

For the GSLB configuration walkthrough refer to Appendix 1 – General GSLB Configuration

1 Round Robin Global Load Balancing

In this scenario we will demonstrate equal DNS distribution between the three VIPs (Site A ISP1, Site A ISP2, and Site B), each query should get an IP from the three possible VIPs.

- Using Chrome browser navigate to "App1", use the bookmark in "Scenario1" directory.
- Note the “Served By” indicating the responsible Alteon and Wanlink indicating the ISP.
- Refresh the page (using ctrl+f5) several times to verify that load balancing takes place.

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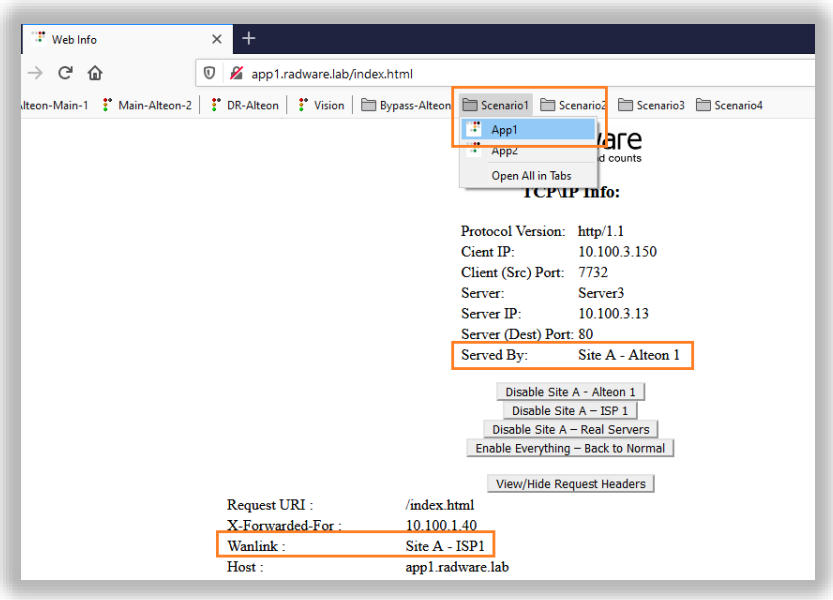

Note:

For the scenario configuration walkthrough refer to Appendix 1 – GSLB Configuration – Scenario 1

2 Local and Global High Availability

In this scenario, Site 2 functions as a Disaster Recovery (DR) site, traffic will be sent to it only in case Site 1 is unavailable.

We are going to demonstrate the following HA scenarios:

- Failure of Alteon 1 in Site A (failover to Alteon 2).
- Failure of ISP 1 in Site A.
- Failure of Site A and failover to Site B.
- Return everything back to normal.

Note:

For the scenario configuration walkthrough refer to Appendix 1 – GSLB Configuration – Scenario 2

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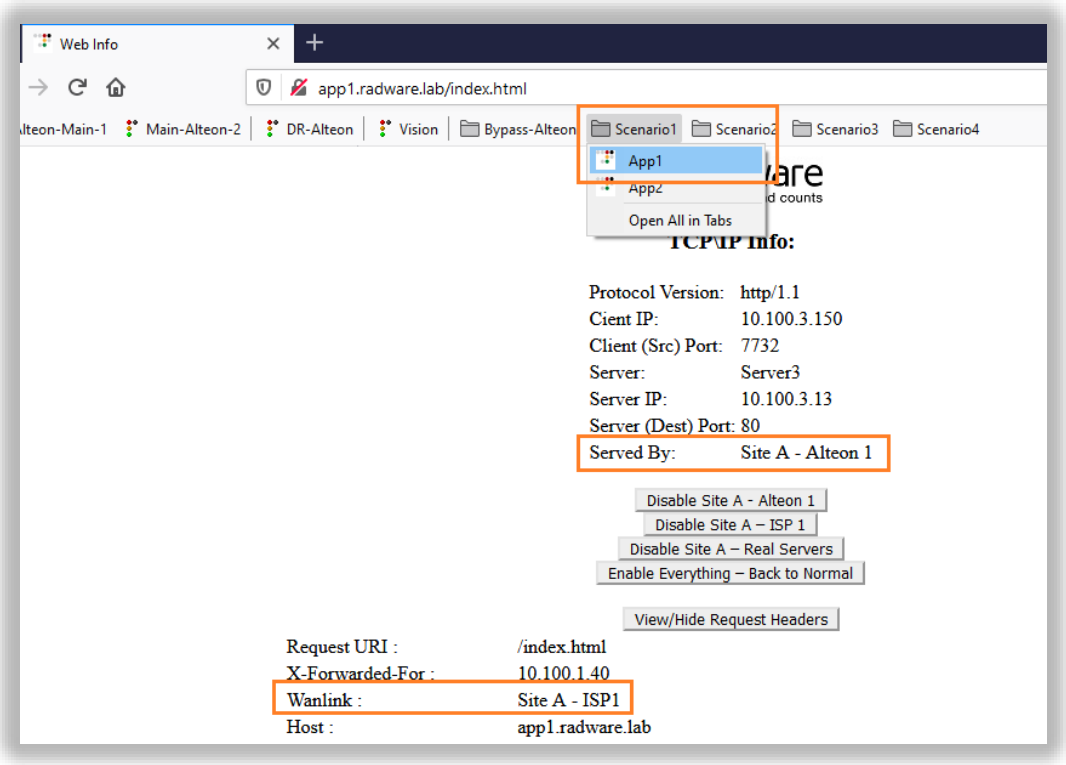
Establish Baseline

In this scenario we will demonstrate equal DNS distribution between the two VIPs in Site A each query should get an IP from the two possible VIPs (ISP 1 or ISP 2).

- Using Chrome browser navigate to "App-2", use the bookmark in "Scenario1" directory.
- Note the "Served By" indicating the responsible Alteon and Wanlink indicating the ISP
- Refresh the page several times to verify load balancing take place



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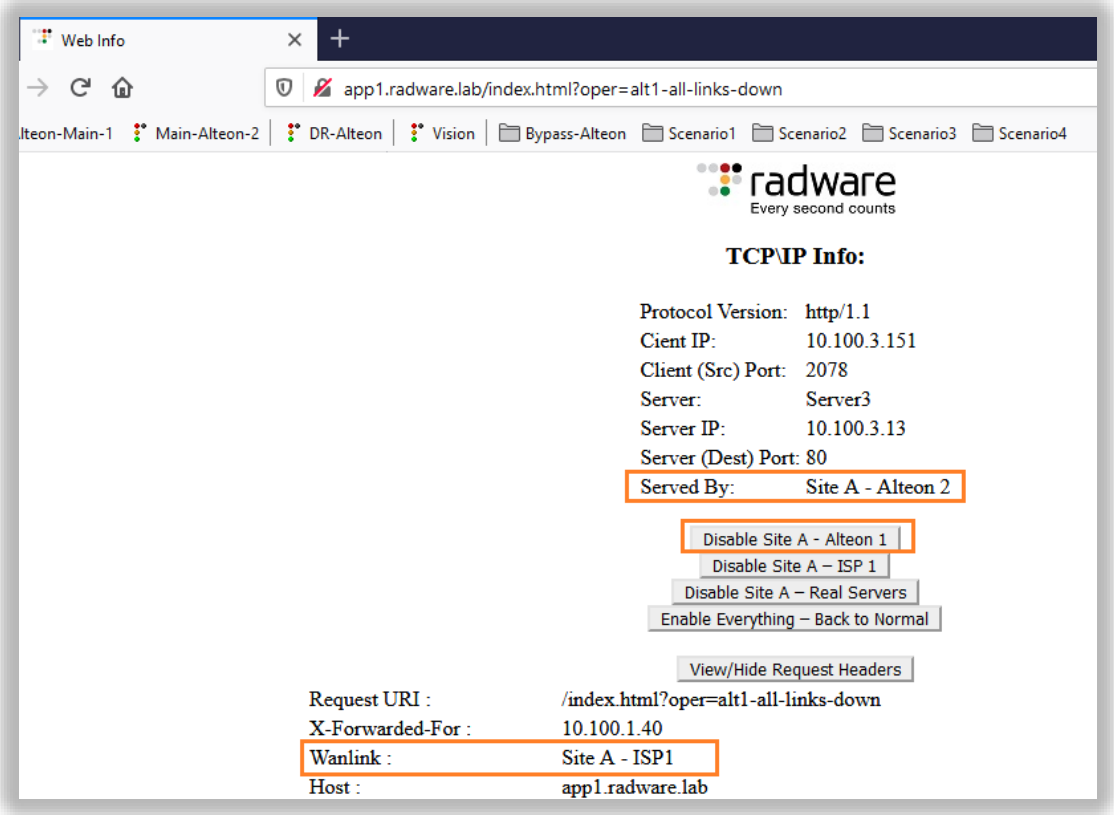
Main Alteon failover

Alteon-1 and Alteon-2 are configured with High-Availability, failover to Alteon-2 does not impact the service. disable all interfaces of Alteon-1 to simulate the failover.

- Using Chrome browser navigate to "App-2", use the bookmark in "Scenario1" directory.
- Click "Disable Site A – Alteon 1" button
- Note the "Served By" indicating the responsible Alteon and Wanlink indicating the ISP
- Refresh the page several times to verify load balancing



- <u>OPTIONALY:</u> verify links are disabled and Alteon 2 is the Master
  - Logon to Alteon 1 and Alteon 2
  - Navigate to Monitoring > *Network > Physical Ports*
  - Note "Operational Status" for each link
  - Navigate to Monitoring > *Network > High Availability*

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- Note “State”

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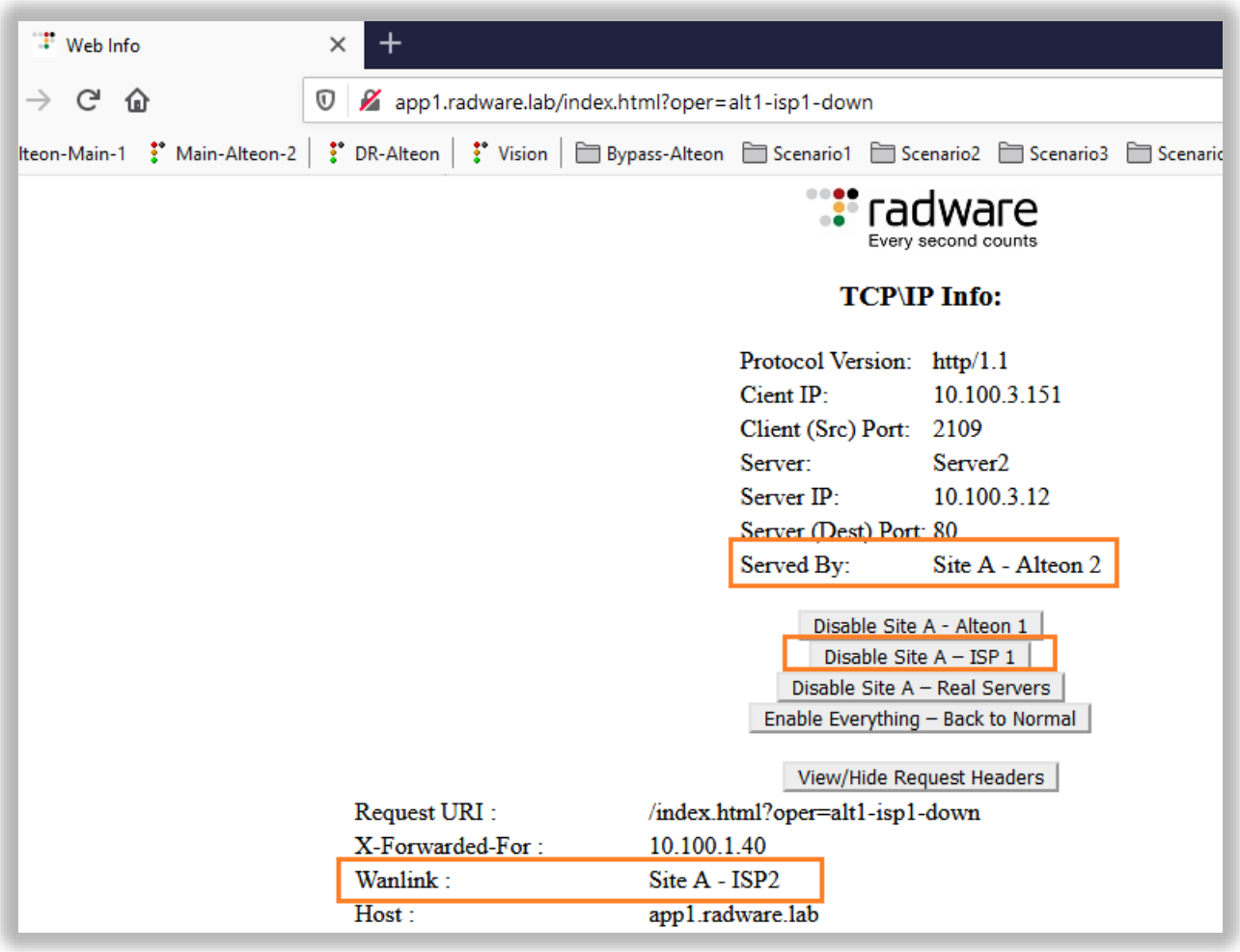
ISP Link failure

In this scenario we disable ISP 1 in Site A forcing the traffic to go through ISP 2 only.

- Using Chrome browser navigate to "App2", use the bookmark in "Scenario1" directory.
- Click "Disable Site A – ISP 1" button
- Note the "Served By" indicating the responsible Alteon and Wanlink indicating the ISP
- Refresh the page several times to verify load balancing



- **OPTIONALY:** Logon to Alteon 2 and verify ISP link 1 (port 2) is disabled
  - Logon to Alteon 2
  - Navigate to Monitoring > *Network > Physical Ports*

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- Note “Operational Status” for each link

Note:

It may take some time for the client to issue a new DNS request to reach the service

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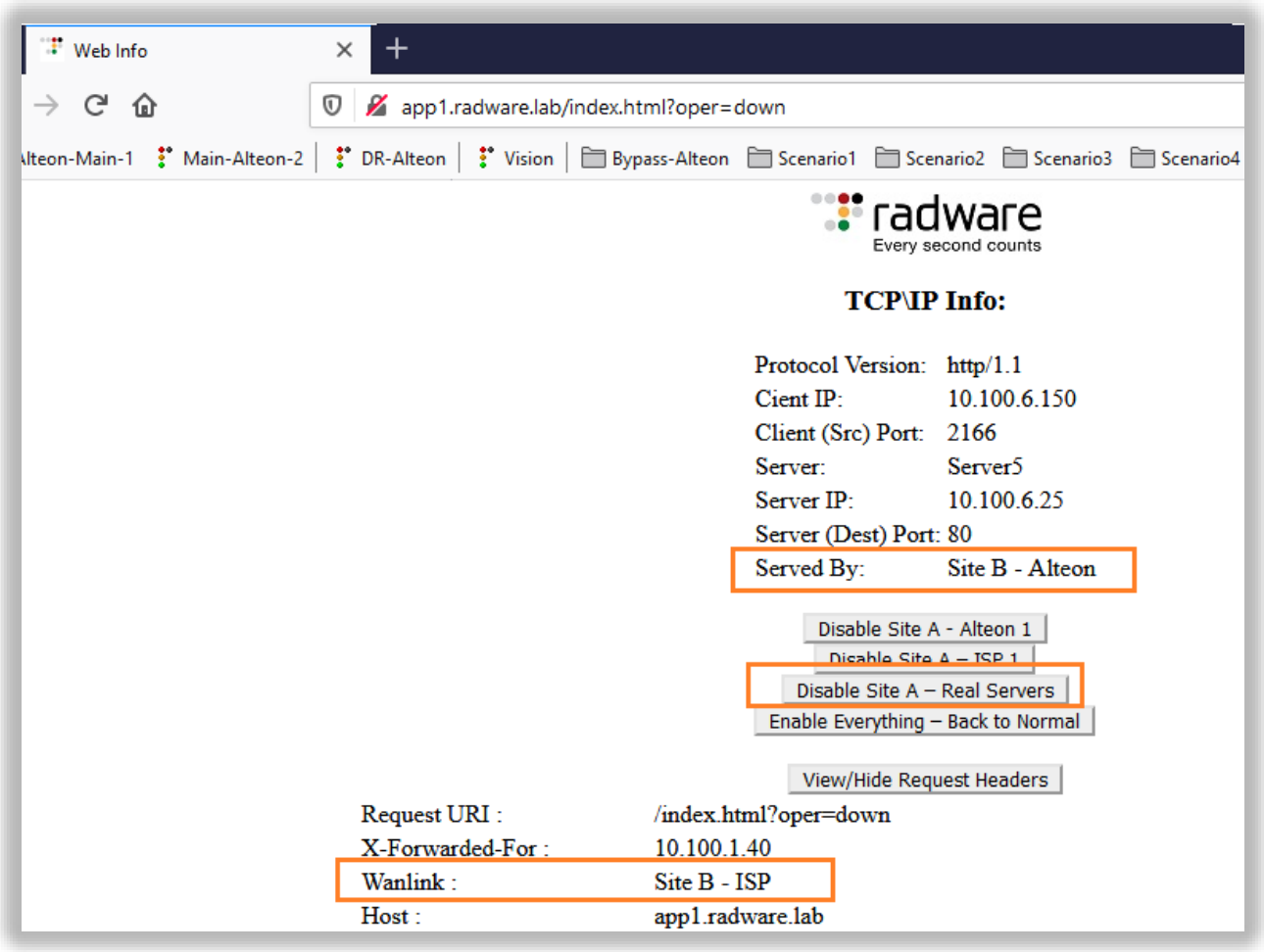
Failover to DR site

In this scenario we disable all local servers of Site A forcing the traffic to go to Site B.

- Using Chrome browser navigate to "App2", use the bookmark in "Scenario1" directory.
- Click "Disable Site A – Real Servers" button
- Note the "Served By" indicating the responsible Alteon and Wanlink indicating the ISP
- Refresh the page several times to verify load balancing



- <u>OPTIONALY:</u> Logon to Alteon 2 and verify real servers are down
  - Logon to Alteon 2
  - Navigate to Monitoring > *Application Delivery > Server Resources > Real Servers*

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- Note “Server Status” of each server

Note:

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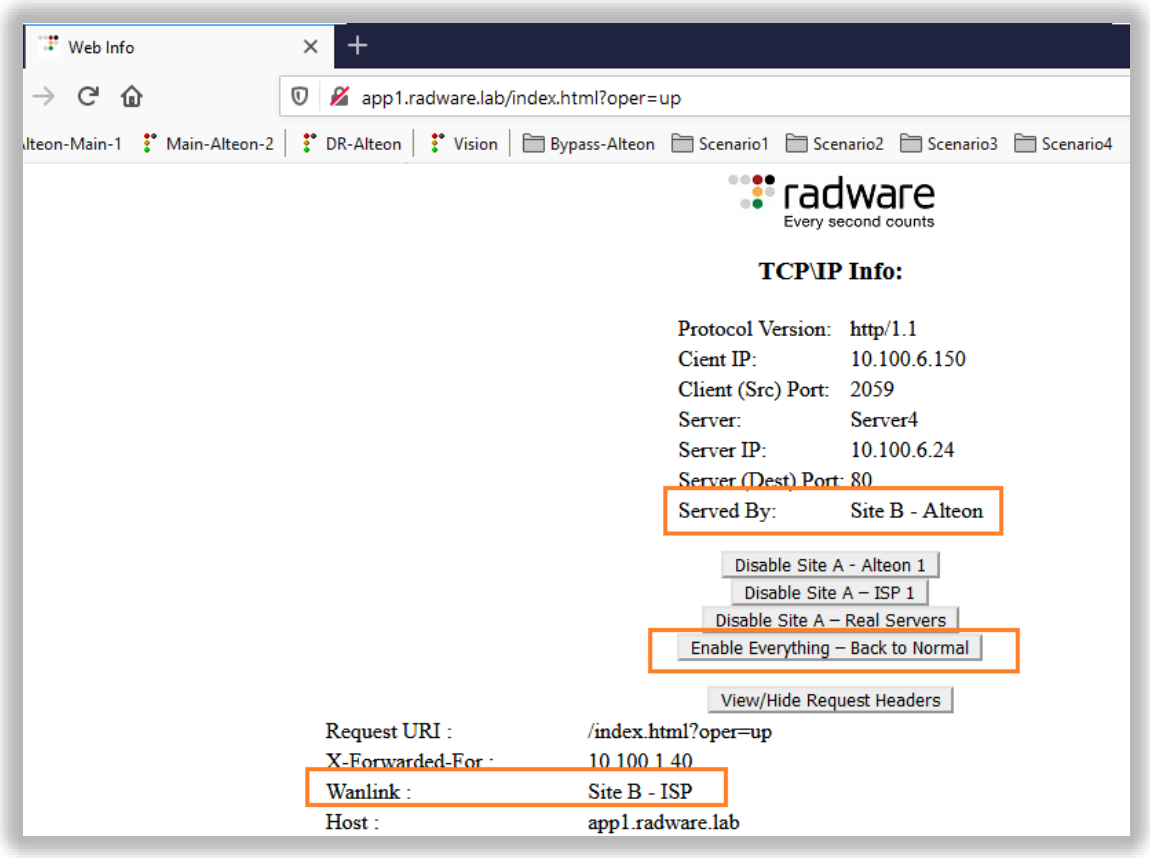
Failback to Original Status

- Using Chrome browser navigate to "App2", use the bookmark in "Scenario1" directory.
- Click "Enable Everything – Back to Normal" button
- Note the "Served By" indicating the responsible Alteon and Wanlink indicating the ISP
- Refresh the page several times to verify load balancing



- **OPTIONALY:** Logon to Alteon 1 and verify it is the Master, links and real servers are up
  - Logon to Alteon 1 and Alteon 2
  - Navigate to Monitoring > *Network > Physical Ports*
  - Note "Operational Status" for each link
  - Navigate to Monitoring > *Network > High Availability*
  - Note "State"

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- Navigate to Monitoring > *Application Delivery > Server Resources > Real Servers*
- Note "Server Status" of each server

Note:

It may take some time for the client to issue a new DNS request to reach the service

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SSL Offloading and Layer 7 Modification Scenarios

In this section we will demonstrate HTTP header and body modification as well as SSL and Compression offloading by the Alteon.

1. Browse Directly to Web Server

In this scenario we show the server response to client request.

- Using Chrome browser Navigate to the application bypassing the Alteon, Use "HTTPS" bookmark in the "Bypass-Alteon" directory.
- Note the following:
  - SSL alert in the address bar
  - Server port is 443
  - No SSL information found in request headers
  - No X-Forwarded-For, X-Cipher-Suite and X-SSL headers
  - GZIP encoding is allowed
  - Statement "Served by Apache"

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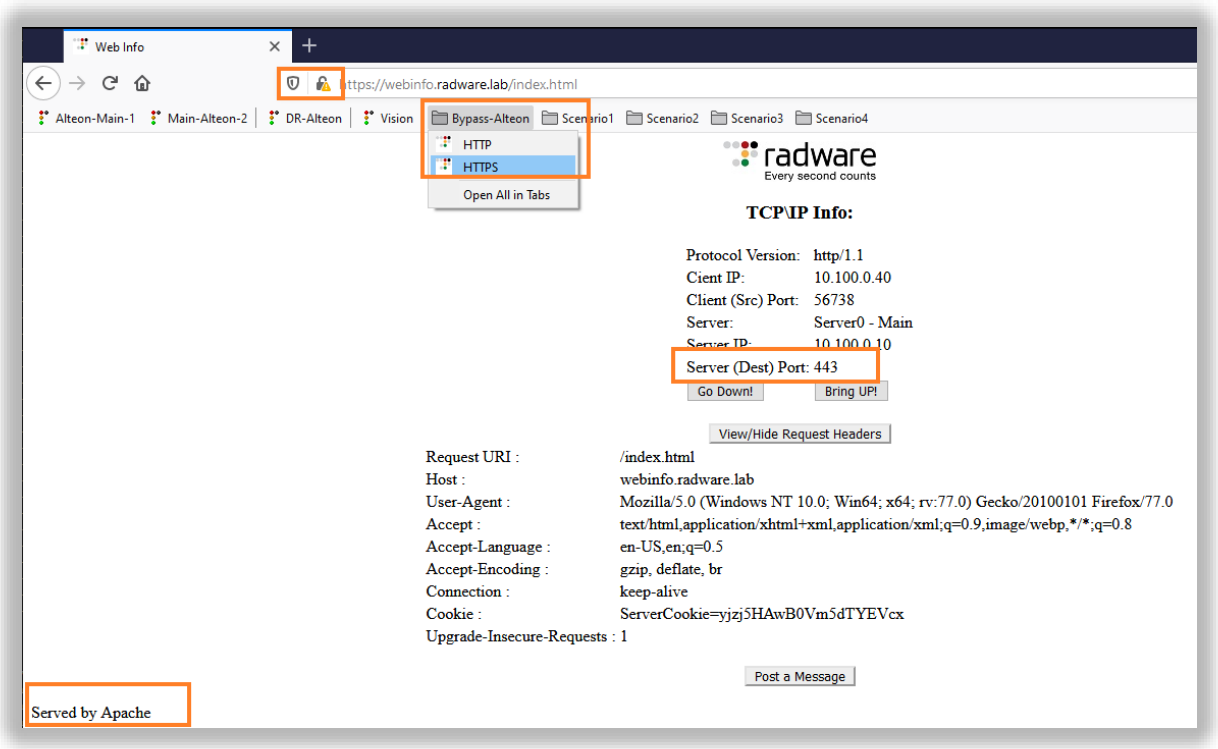

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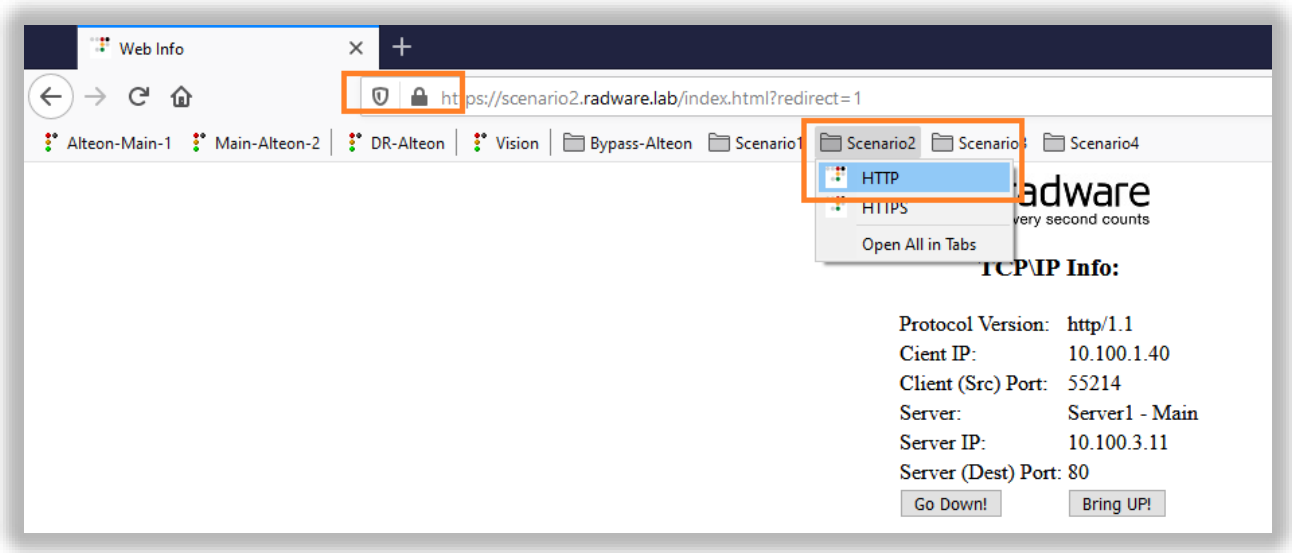
Redirect HTTP to HTTPS

In this scenario we demonstrate how the Alteon modifies HTTP requests to HTTPS using 307 redirect.

- Using Chrome browser Navigate to the application through the Alteon, Use "HTTP" bookmark in the "Scenario 2" directory.
- Note the bookmark is for HTTP, but the connection is HTTPS.



OPTIONAL: to view the redirect use Chrome debugger (F12) Network tab

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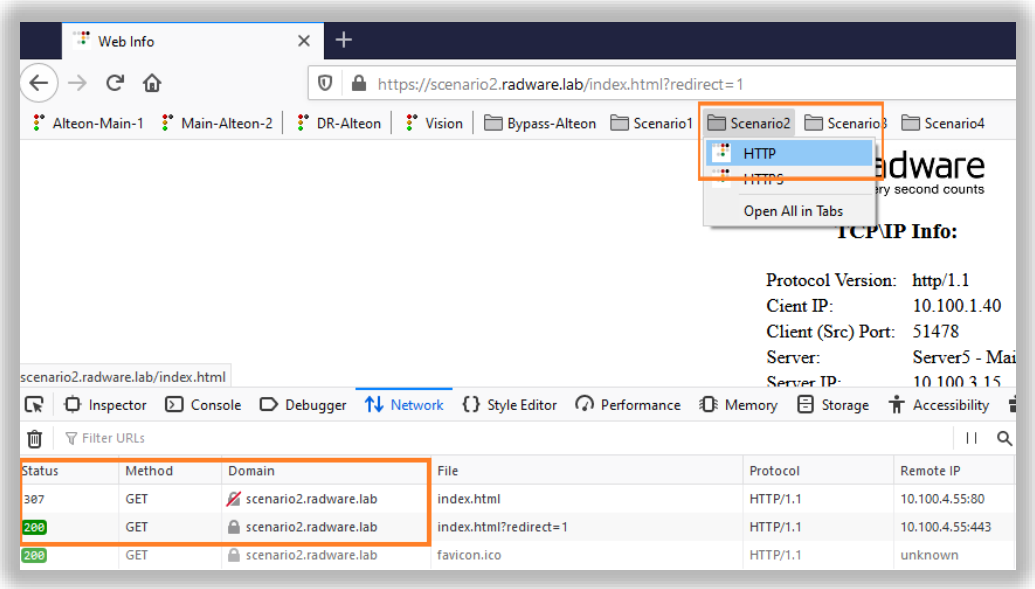

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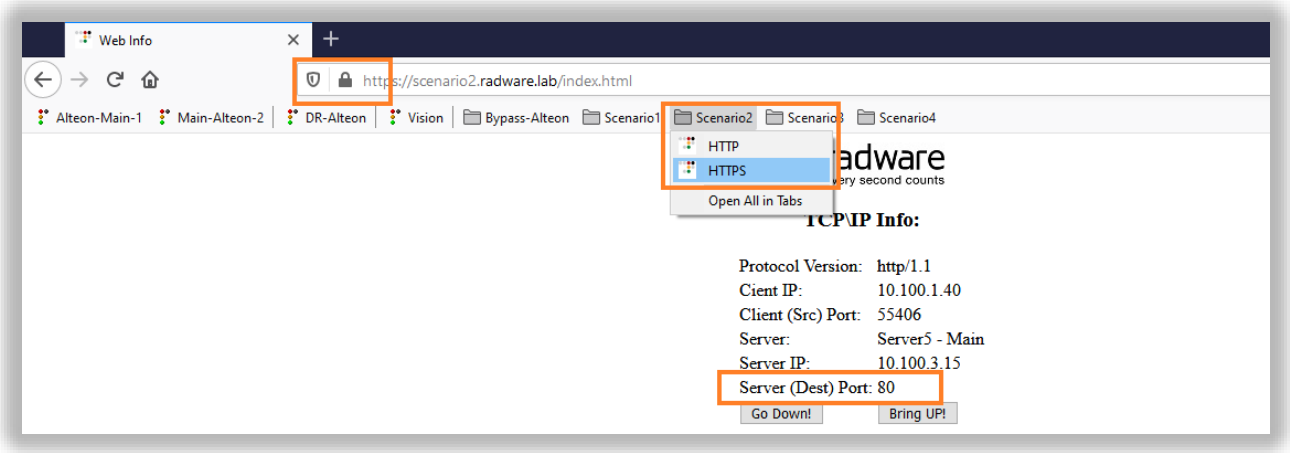
SSL Offloading

In this scenario we demonstrate the SSL offloading feature.

- Using Chrome browser Navigate to the application through the Alteon, Use "HTTPS" bookmark in the "Scenario 2" directory.
- Note even though the connection is secure the Server got a connection on port 80



Note:

For the scenario configuration walkthrough refer to Appendix 2 – SSL Offloading and L7 Modification – Scenario 1

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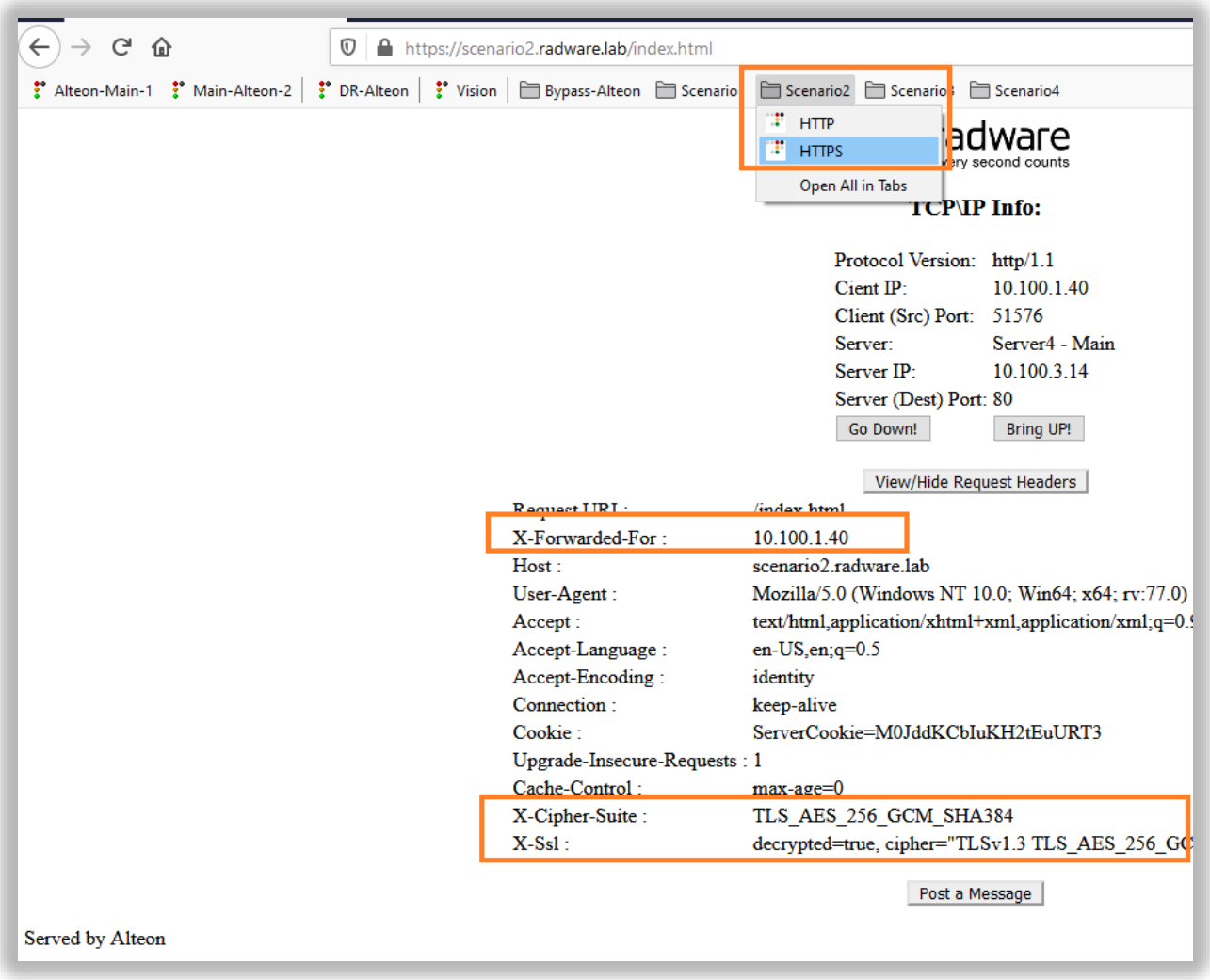
2. HTTP Header Injection

In this scenario we demonstrate multiple headers injection by the Alteon.

- Using Chrome browser Navigate to the application through the Alteon, Use "HTTPS" bookmark in the "Scenario 2" directory
- Note X-Forwarded-For, X-Cipher-Suite and X-SSL headers were added (Was not there when browsing directly to the server in scenario 1).



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For the scenario configuration walkthrough refer to Appendix 2 – SSL Offloading and L7 Modification – Scenario 2

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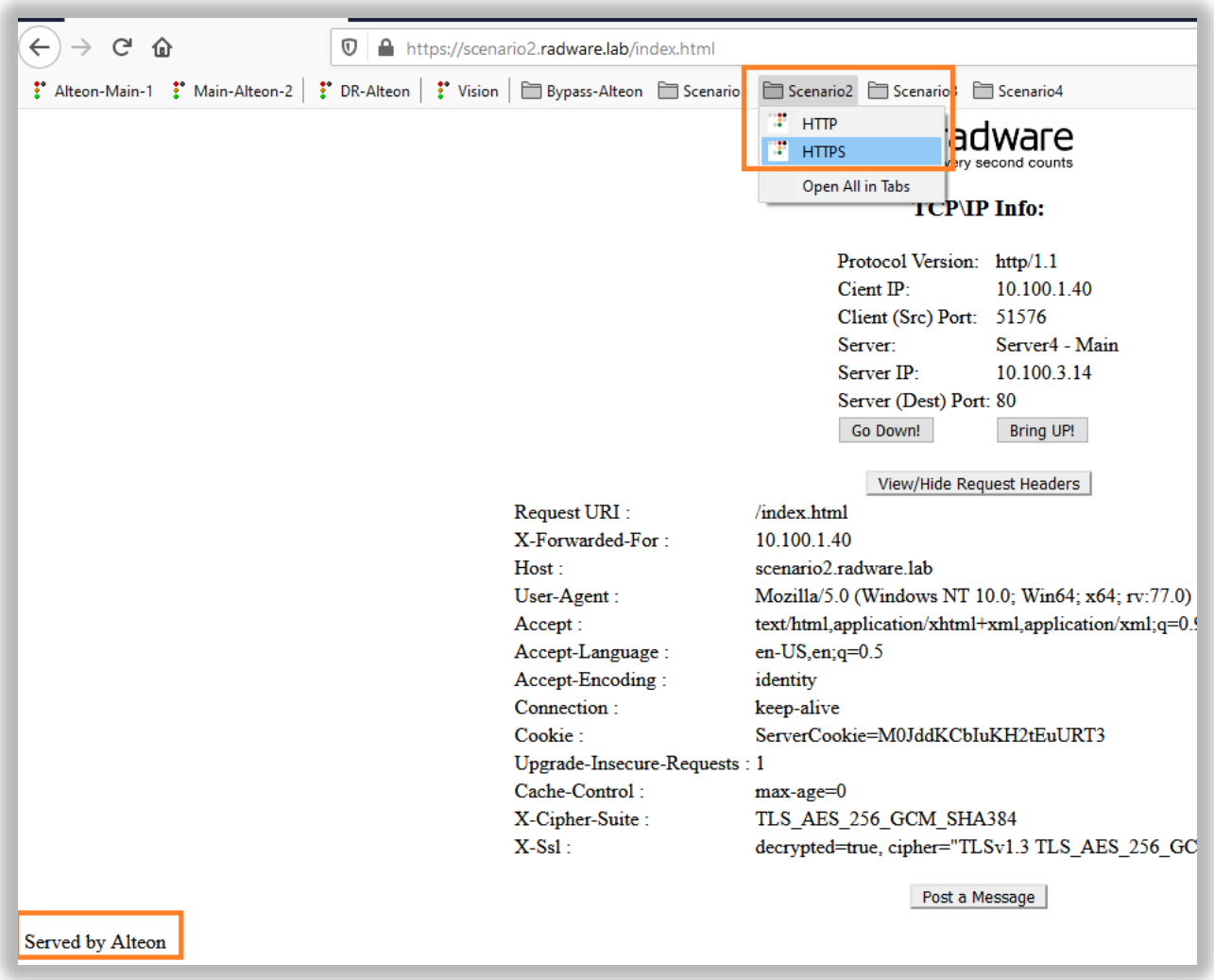
3. HTTP Body Modification

In this scenario we demonstrate HTTP content modification by the Alteon.

- Using Chrome browser Navigate to the application through the Alteon, Use "HTTPS" bookmark in the "Scenario 2" directory.
- Note bottom statement states "Served by Alteon" (Was “Server by Apache” when browsing directly to the server in scenario 1)



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For the scenario configuration walkthrough refer to Appendix 2 – SSL Offloading and L7 Modification – Scenario 3

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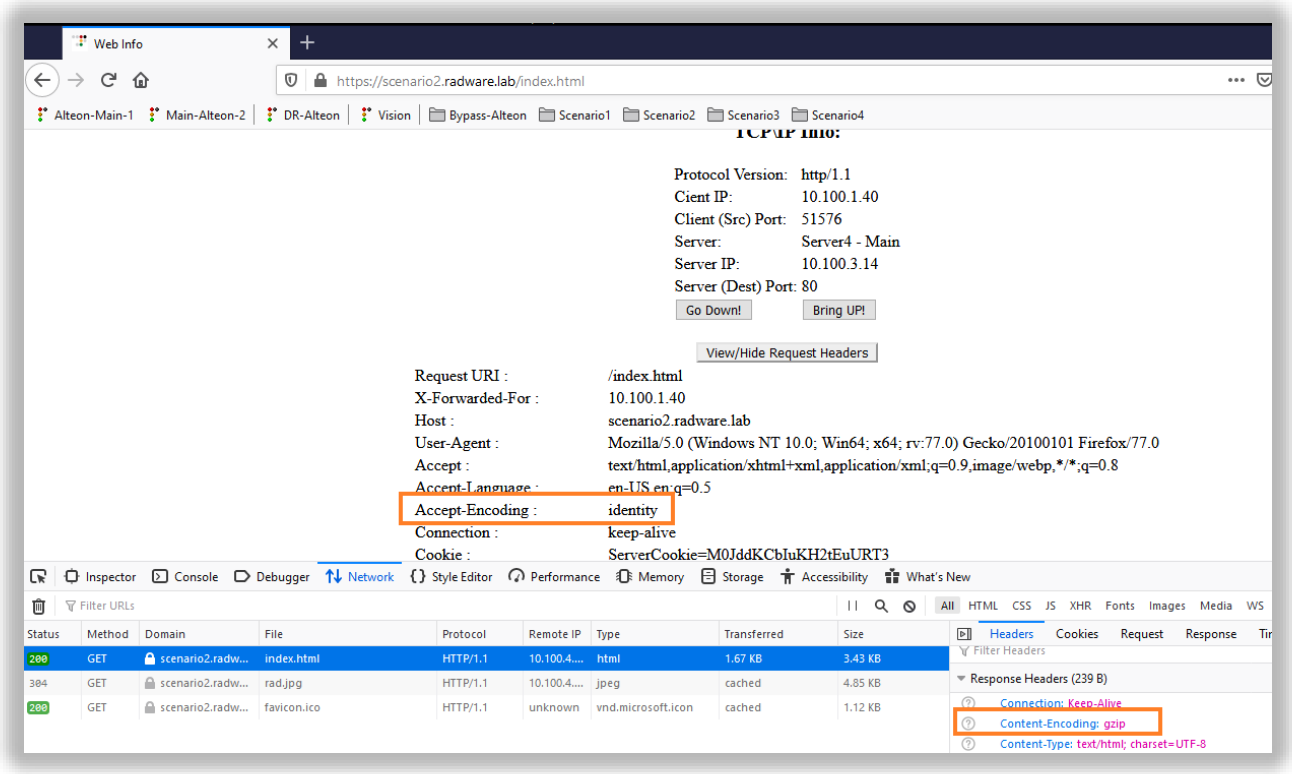
4. Compression Offloading

In this scenario we demonstrate the Compression offloading feature.

- Use Chrome debugger (F12) Network tab, Refresh the page and select "scenario2.radware.lab" to view request and response headers
- Note "Accept-Encoding" header received by the server is set to identity (meaning compression is not allowed) but "Content-Encoding" in the response to the client is set to 'GZIP' Meaning the traffic between Client and Alteon is compressed but traffic between Alteon and server is not compressed.



Note:

For the scenario configuration walkthrough refer to Appendix 2 – SSL Offloading and L7 Modification – Scenario 4

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Content Based Load Balancing Scenarios

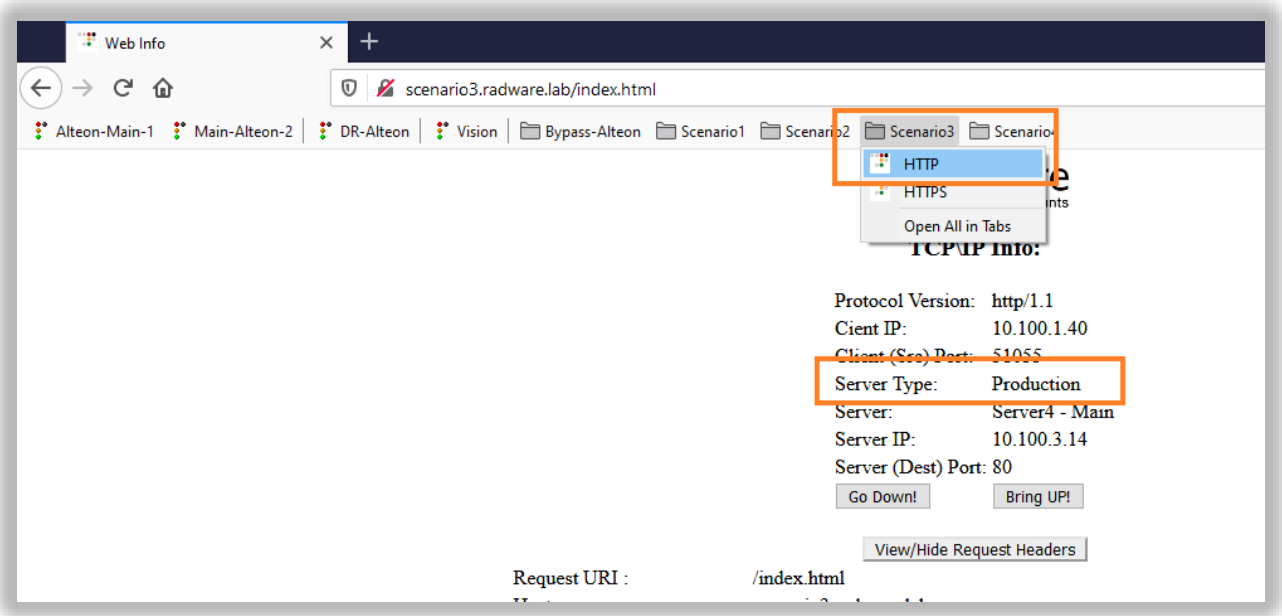
In this section we will demonstrate server group selection based on host name as follows:

Hostname	Group Name	Group Members
Scenario3-dev.radware.lab	Scenario3-dev	Server #1 (10.100.3.11)
Scenario3-stg.radware.lab	Scenario3-stg	Server #2 and Server #3 (10.100.3.12-13)
Scenario3.radware.lab	Scenario3-prod	Server #4 and Server #5 (10.100.3.14-15)

1. HTTP Content Based Rules

In this scenario the Alteon reads the HTTP headers and performs the decision based on the host header.

- Use Chrome browser and navigate to "Scenario3 – **Prod** – HTTP" found in "Scenario 3" directory.
- Note the server type is **production**.



Note:

For the scenario configuration walkthrough refer to Appendix 3 – Content Based Rules – Scenario 1

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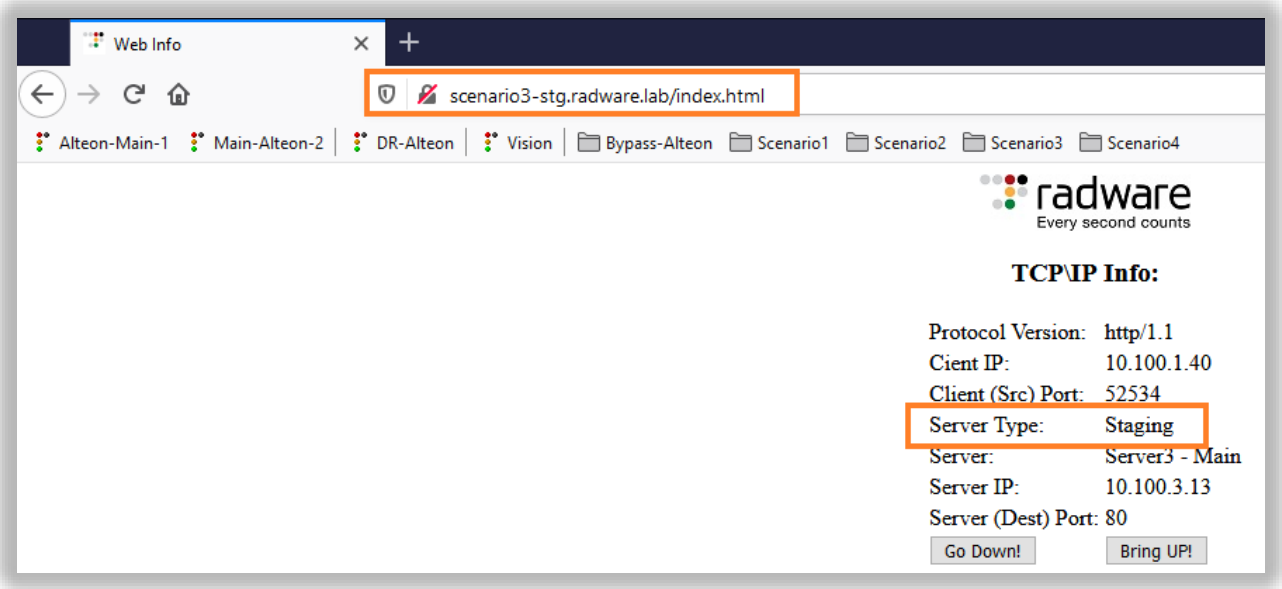
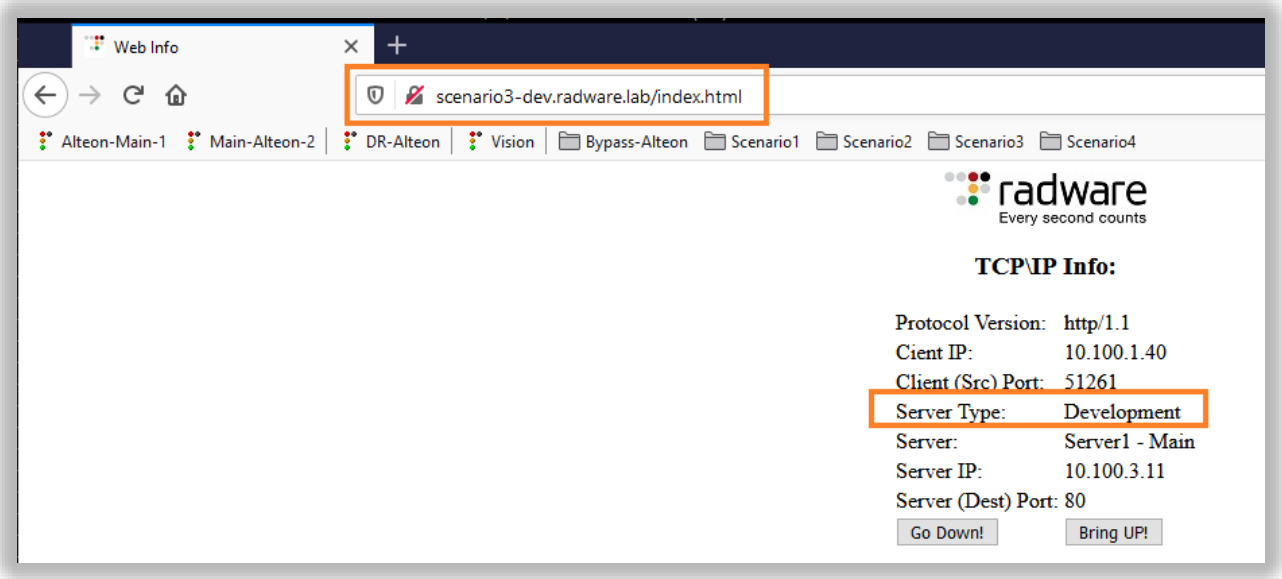
- Add "-**stg**" to change the URL to: "http://scenario3-stg.radware.lab/"
- Note the server type is **Staging**.



- Change "stg" in the URL to "**dev**" to get "http://scenario3-dev.radware.lab/"
- Note the server type is **Development**.



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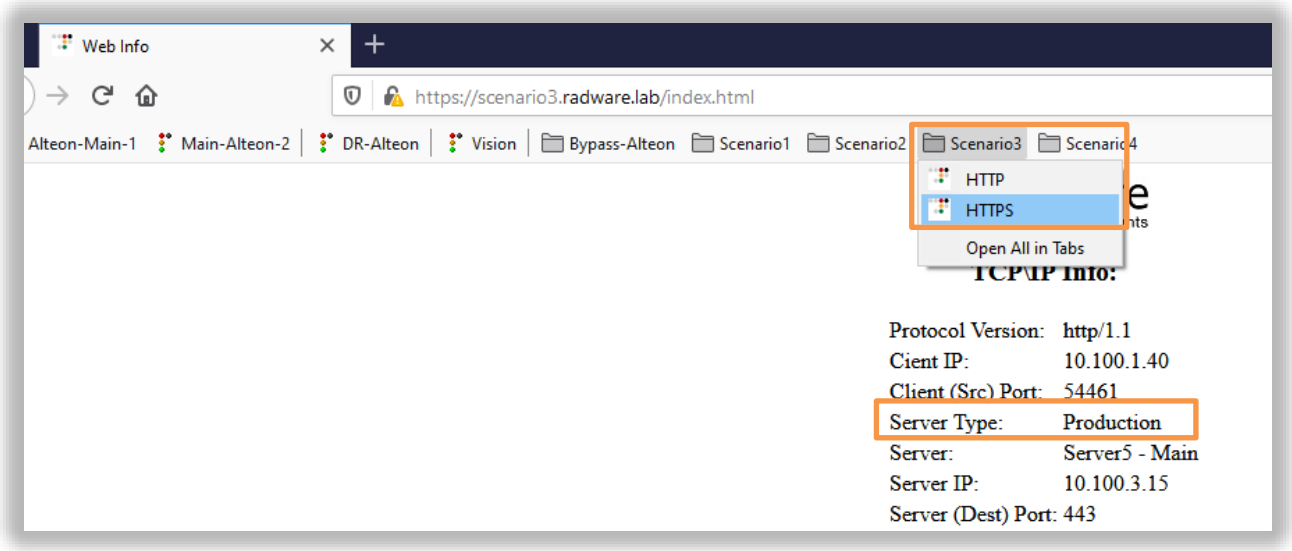
2. HTTPS Content Based Rules

In this scenario the Alteon selects the server group based on the value of the Server Name Indication (SNI) header without SSL\TLS offloading.

- Use Chrome browser and navigate to "Scenario3 – **Prod** – HTTPS" found in "Scenario 3" directory
- Note that the server port is 443
- Note the server type is **Production**.



Note:

For the scenario configuration walkthrough refer to Appendix 3 – Content Based Rules – Scenario 2

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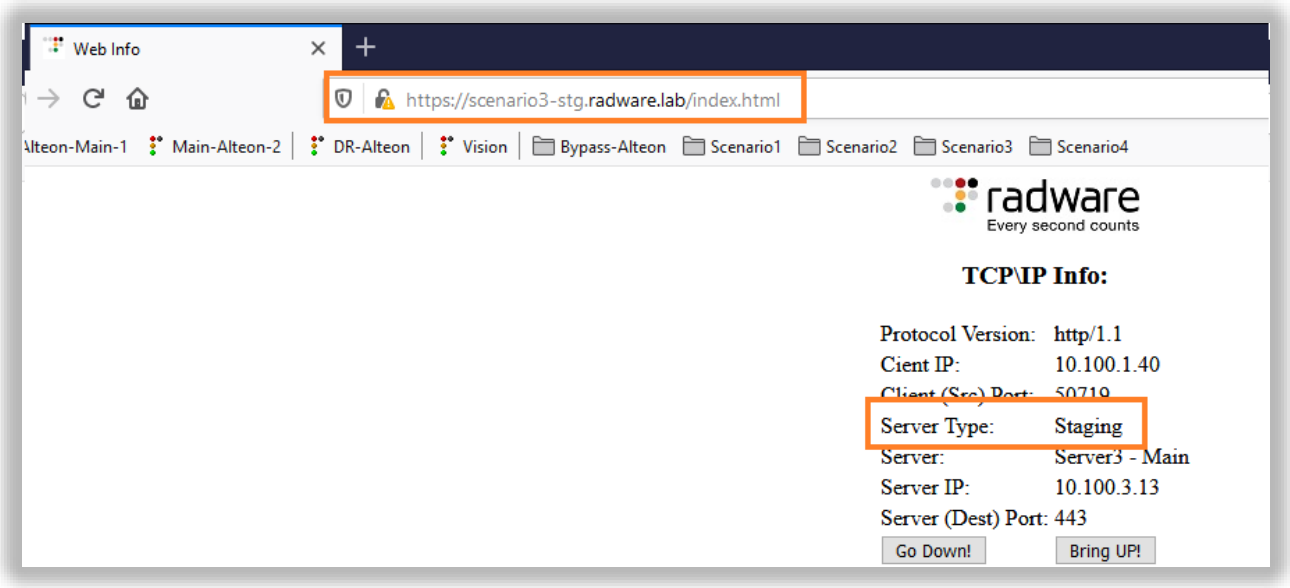
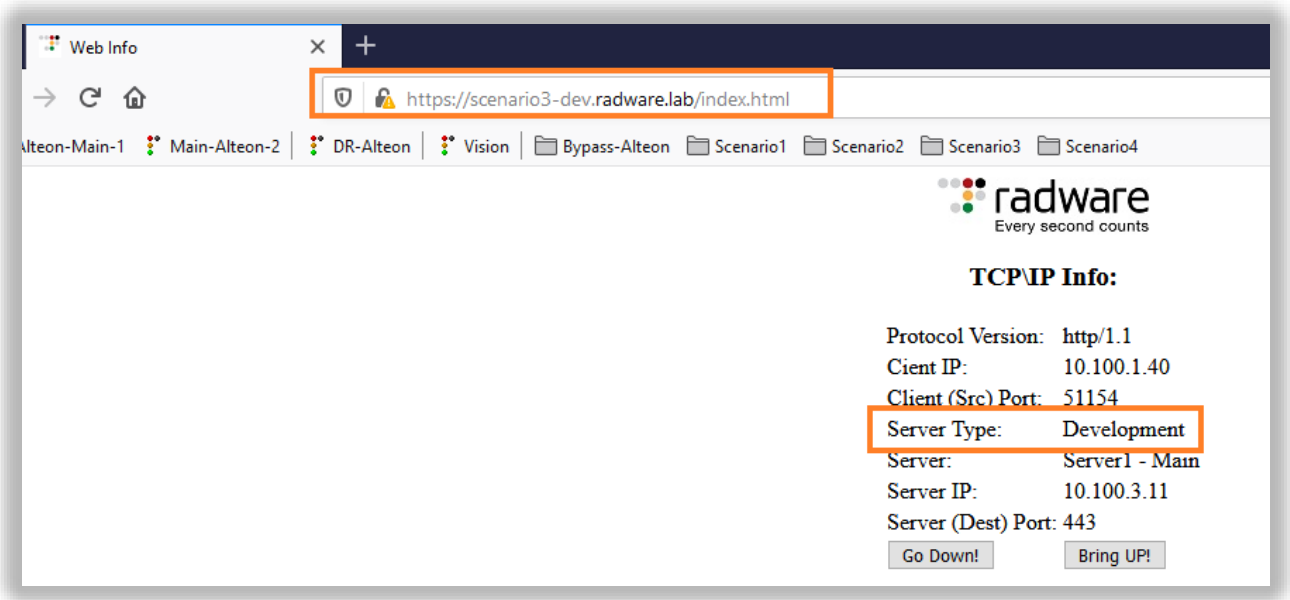
- Add "-**stg**" to change the URL to: "http://scenario3-stg.radware.lab/"
- Note the server type is **Staging**.



- Change "stg" in the URL to "**dev**" to get "http://scenario3-dev.radware.lab/"
- Note the server type is **Development**.



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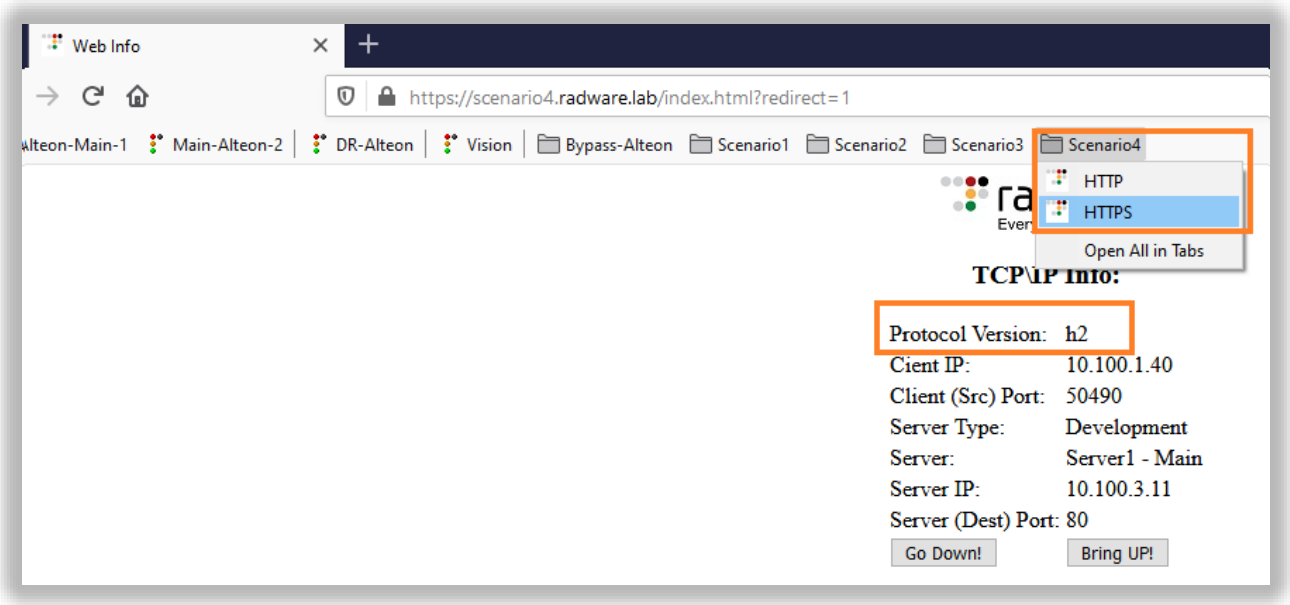
HTTP2 Gateway Scenario

In this scenario we will demonstrate using the Alteon as an HTTP2 gateway, traffic from client to Alteon is HTTP/2.0 and from Alteon to server is HTTP/1.1

Note:

For the scenario configuration walkthrough refer to Appendix 4 - HTTP/2.0 GW

- Using Chrome navigate to the application use the "HTTPS" bookmark located in the "Scenario 4" directory
- Note protocol is H2 meaning HTTP/2.0 – In order to visualize the protocol webpage is embedded with a JavaScript displaying the HTTP version of the browser (between client and Alteon) same information can be viewed via Chrome debugger (F12)



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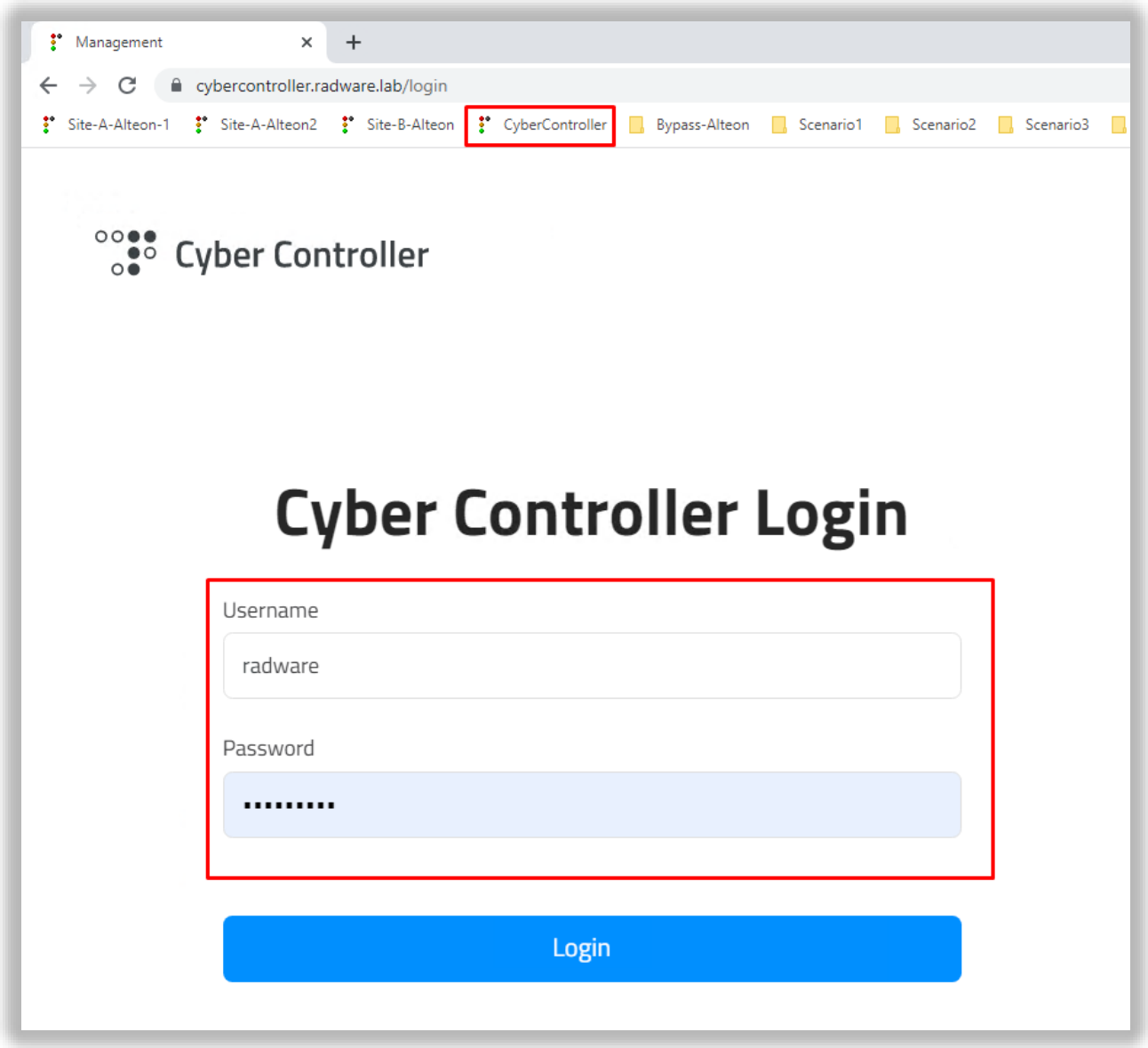
Scenario – 5 – Advanced Analytics

In this scenario we will demonstrate logs collected by the Cyber controller analytics engines, show different information ranging from L4 through L7.

- Login to Cyber controller (radware:Radware1!)



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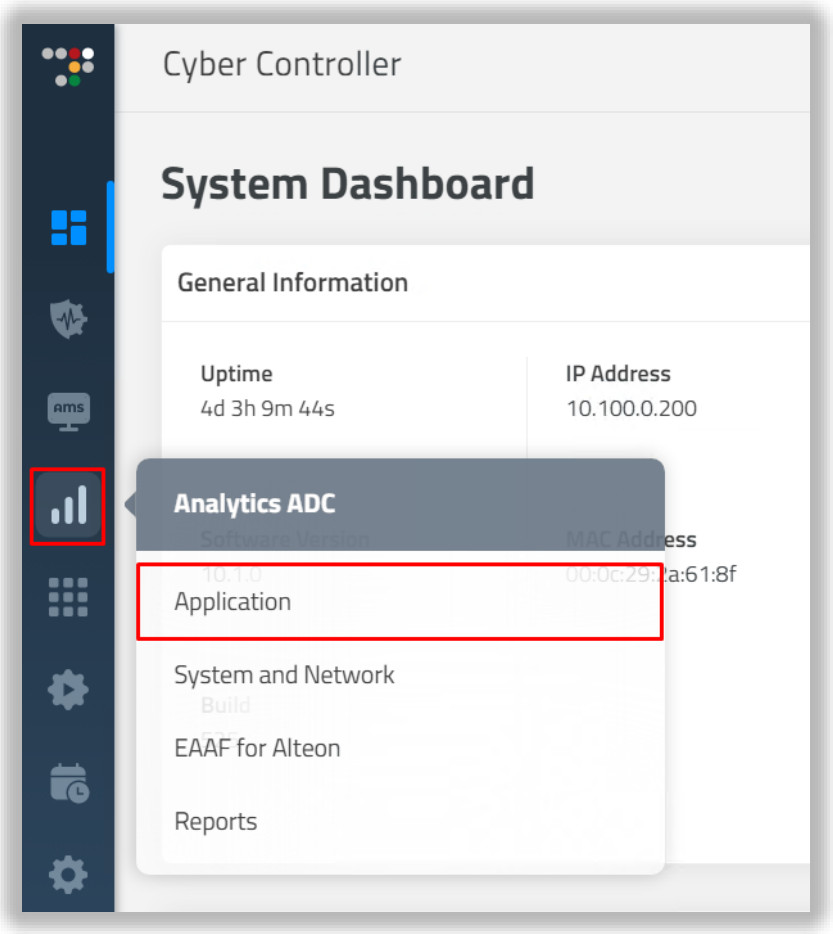
Navigate to “Analytics ADC” and click Application



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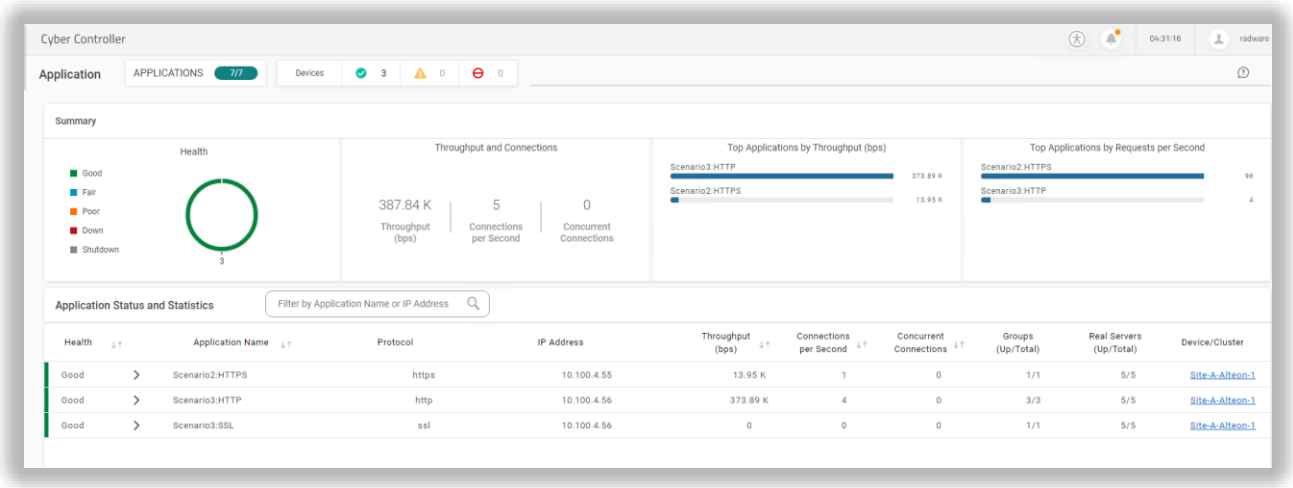
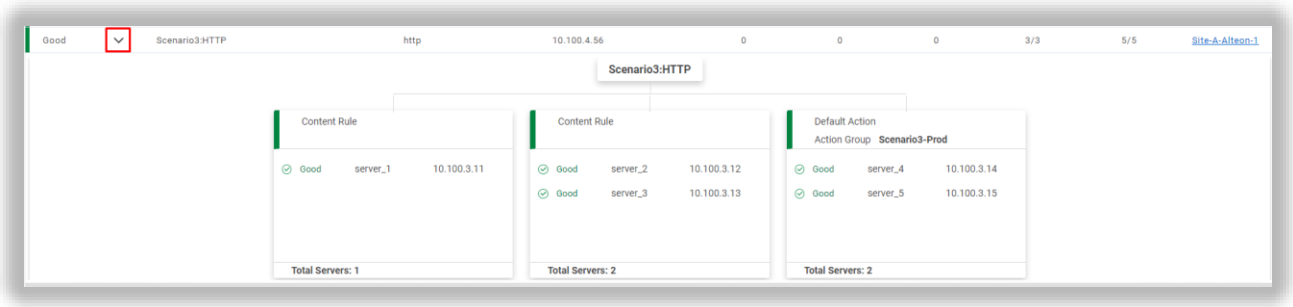
The following window opens



Note "Top-Talkers" and other layer4 information about the services.

- Expand "Scenario3:HTTP" by clicking the Arrow near it



Note the content rules, service and servers' status visualization

- Drill down into "Scenario3:HTTP" by clicking it

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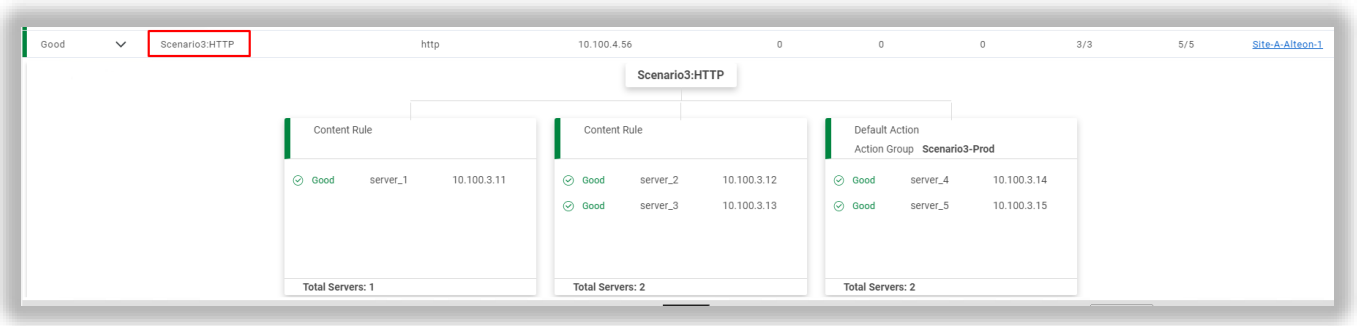
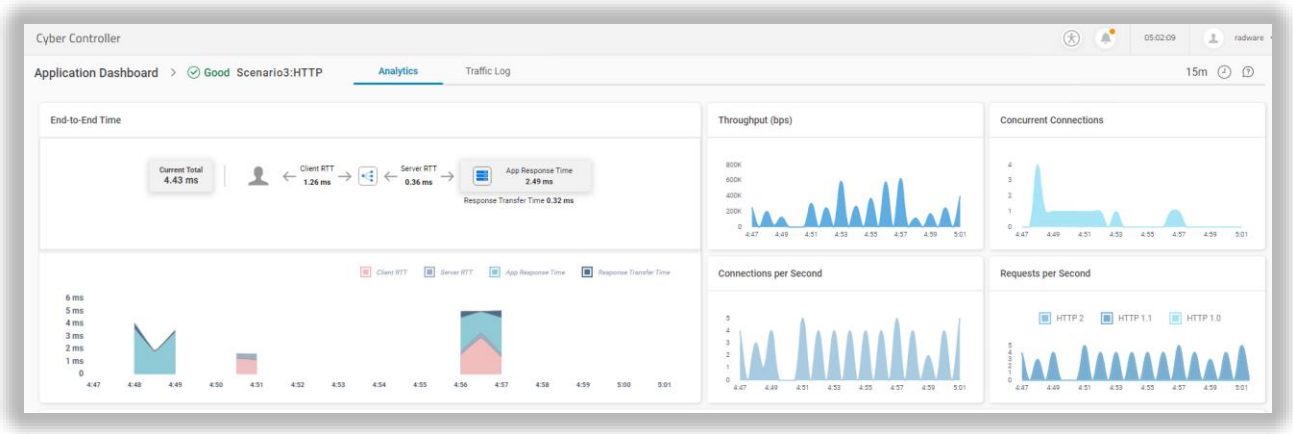


The following window opens:

Note application statistics, such as end to end RTT, throughput, CPS, etc…



- Navigate to “Traffic Log” and Note the HTTP information from the different requests.

The following window opens:

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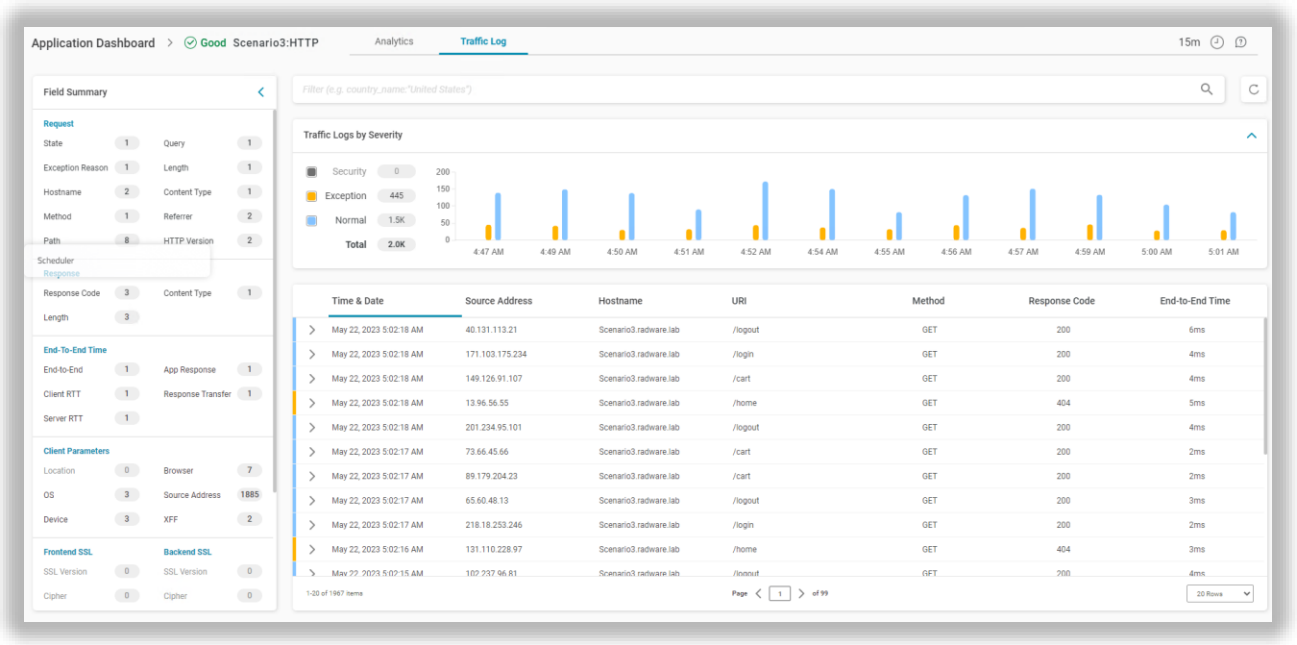

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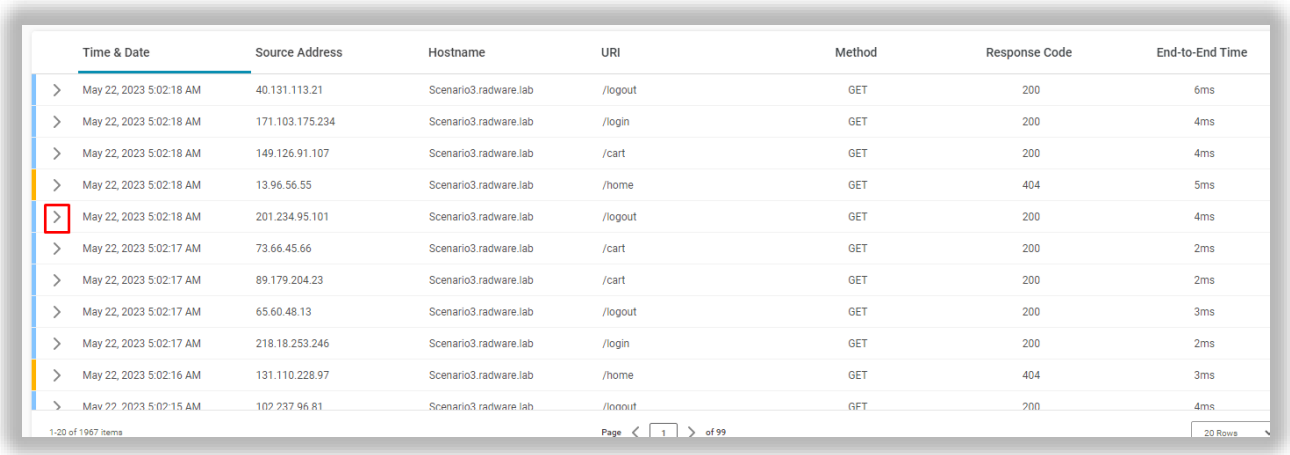
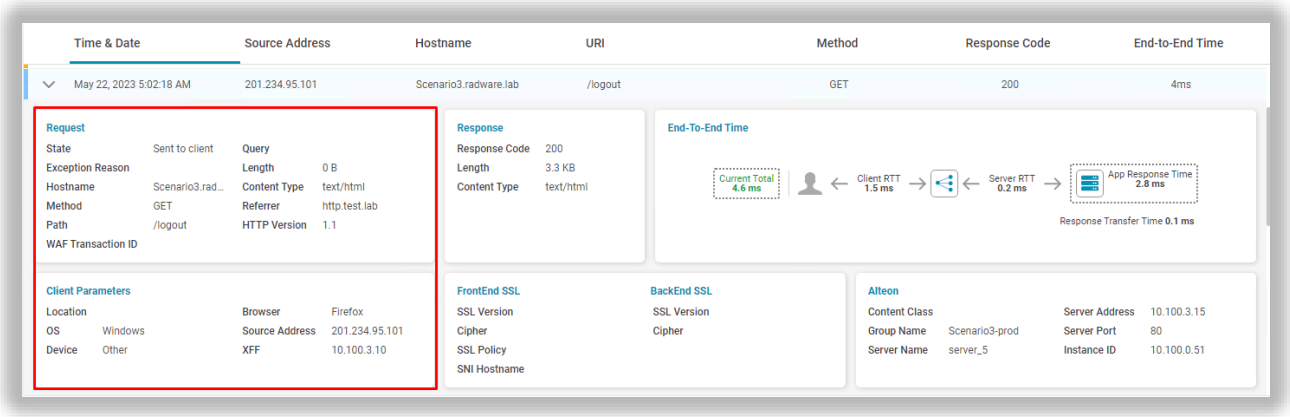
- Expand one of the requests for more information



The following window opens:



Note request information as well as the client parameters.

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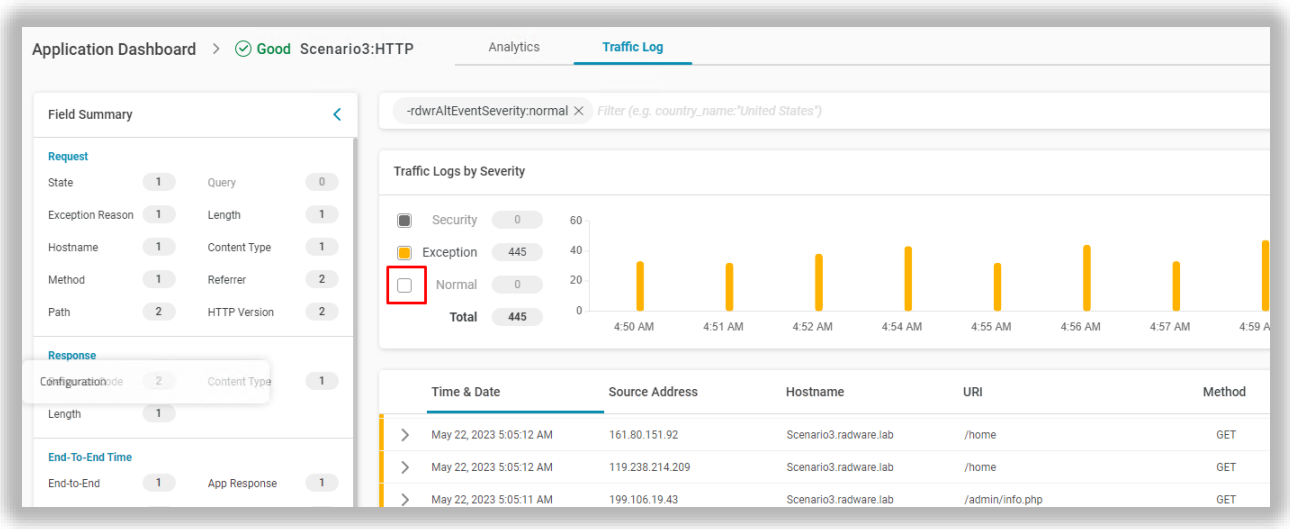
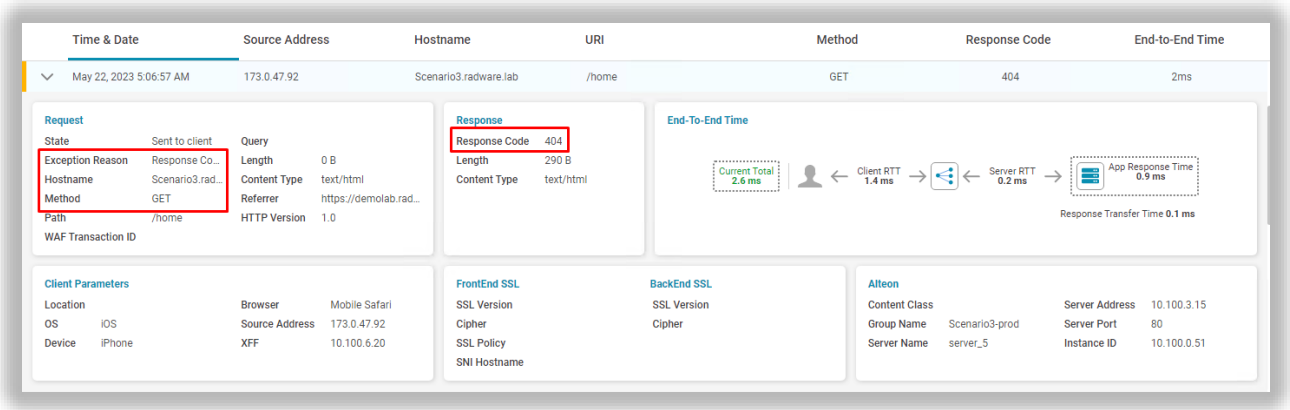


- Drilldown to failed requests by unchecking "Normal" and leaving only "Exception".
- Expand one of the exceptions by clicking the arrow next to it and note the Exception reason as well as the response code.



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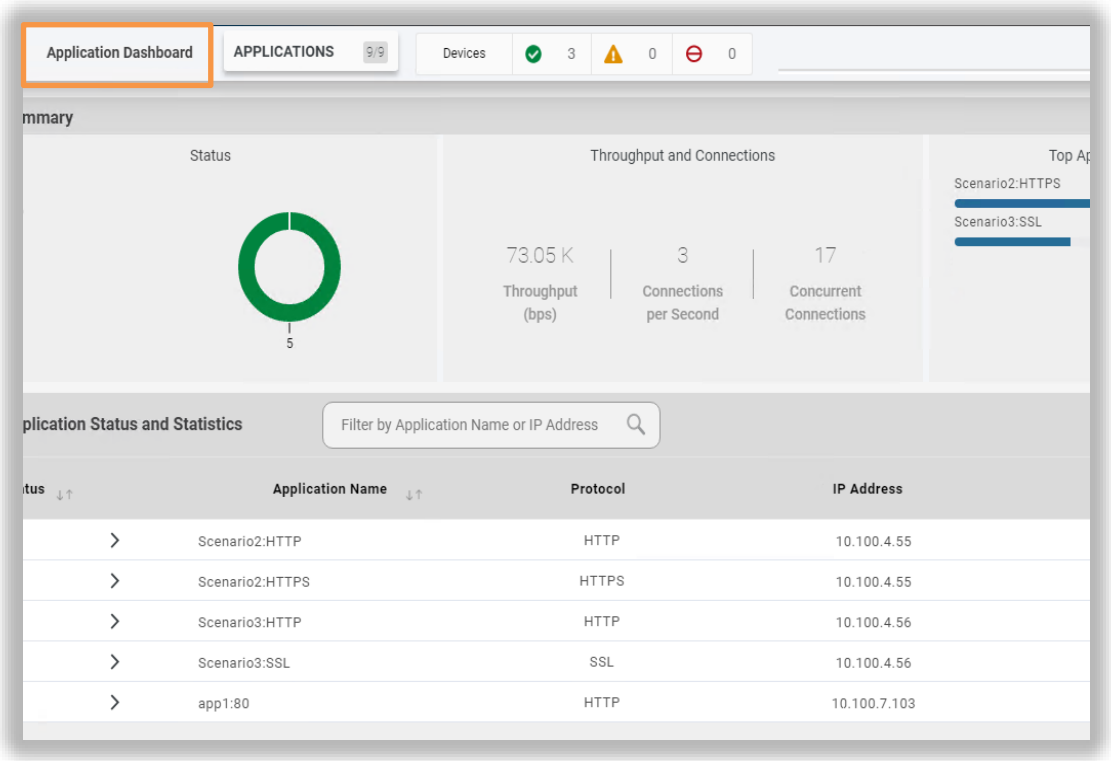
- Navigate back to Application dashboard



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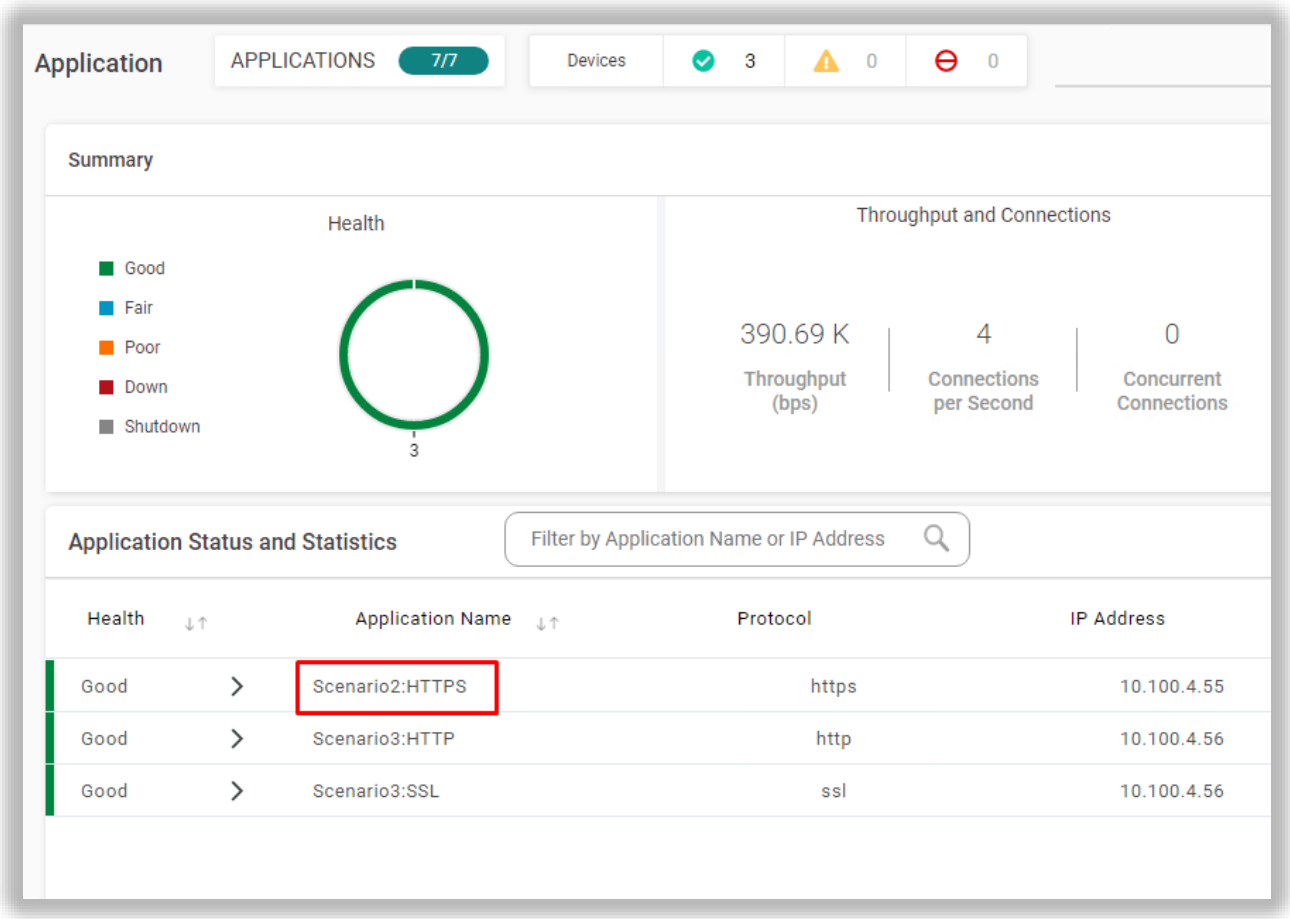
- drill down "Scenario2:HTTPS"



- Use the fields Summary to drilldown to several requests, for example based on "No shared ciphers found".

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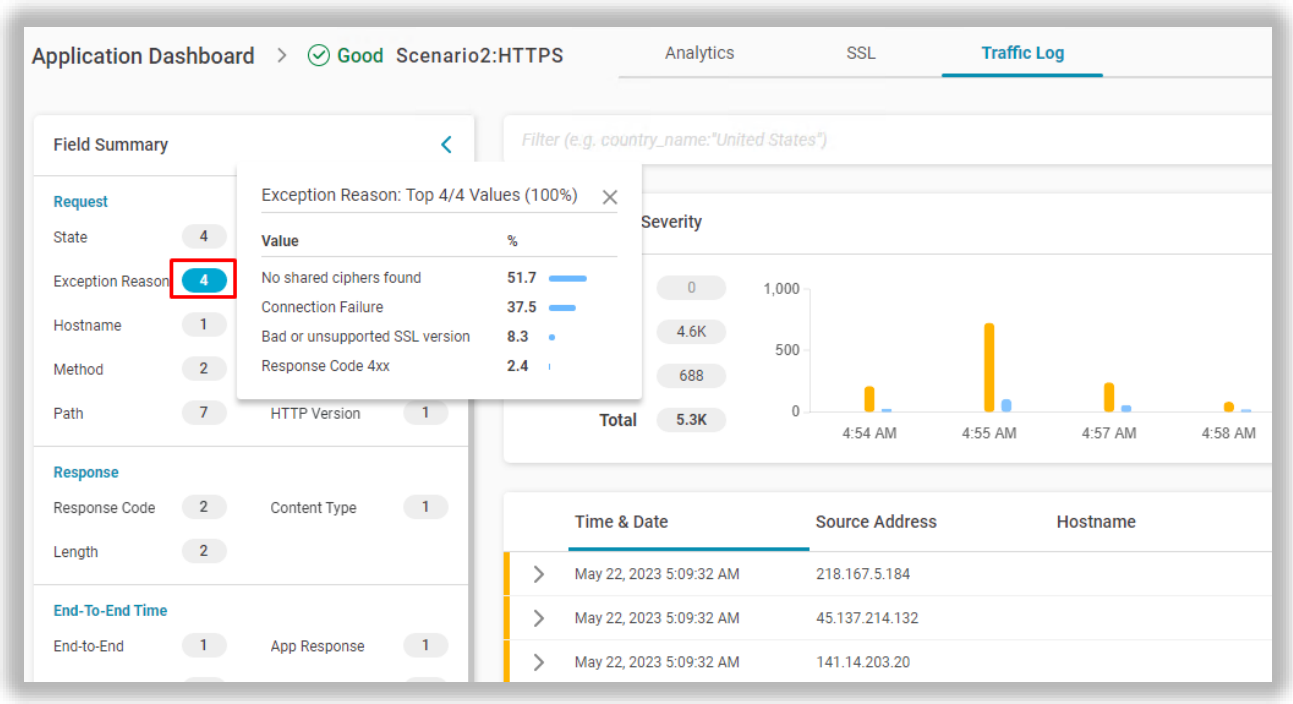
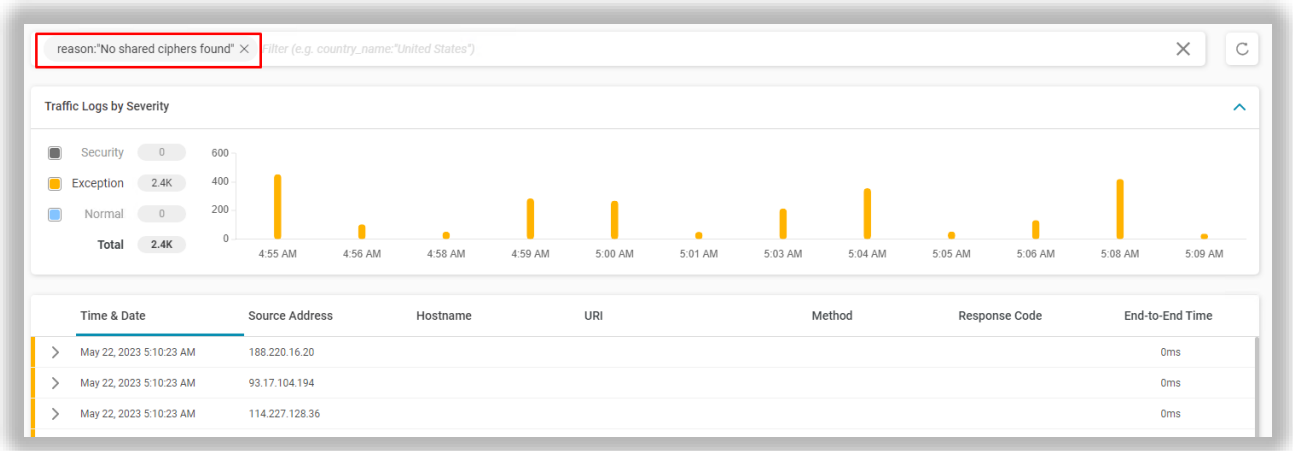


The following window opens:



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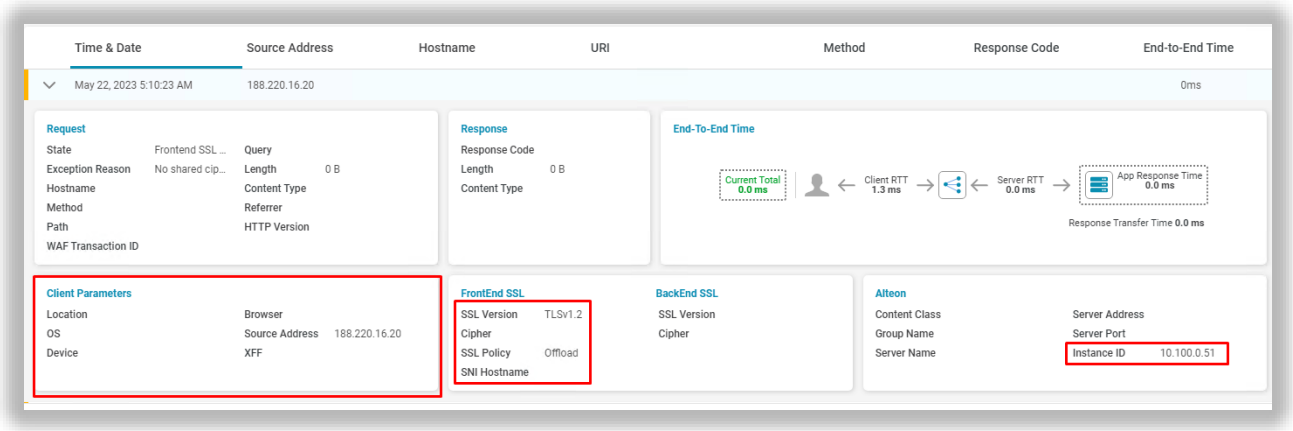
- Expend one of the requests to view more information.



Note the client parameters, SSL policy information and instance ID.

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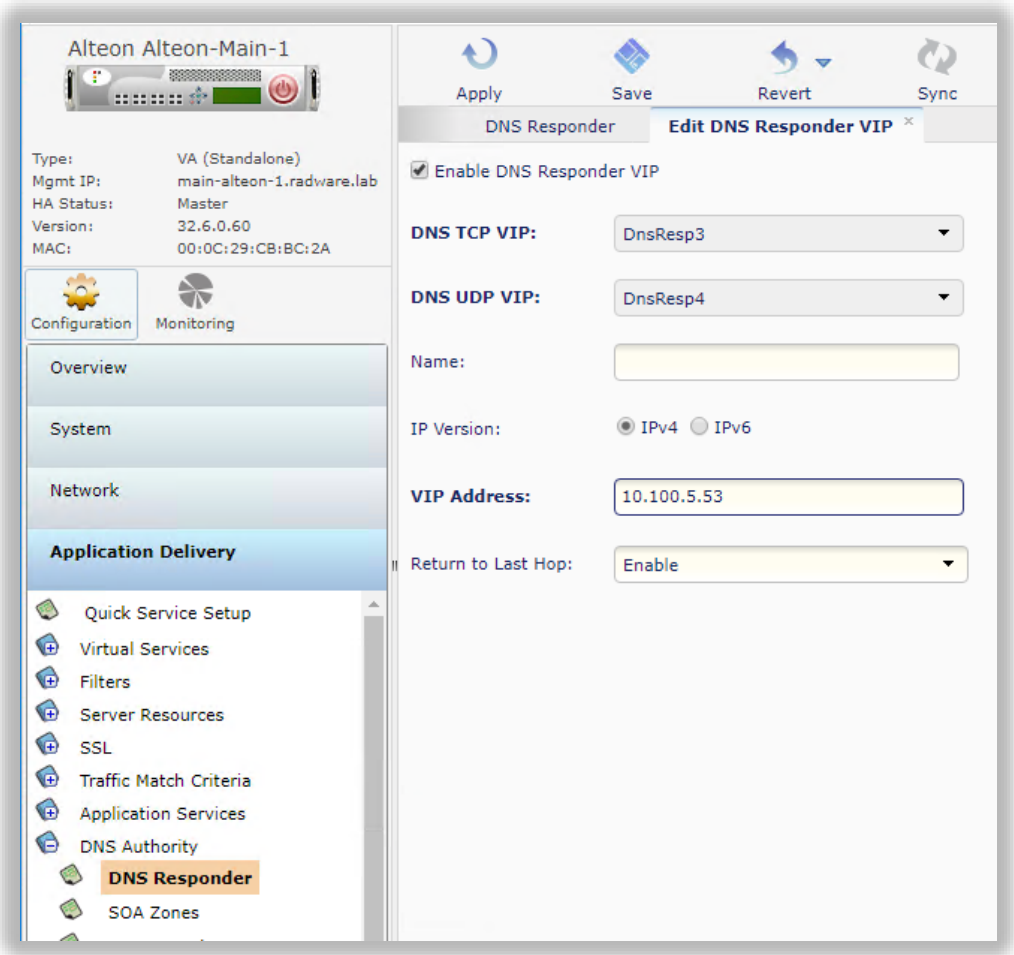
APPENDIX 1 – GSLB CONFIGURATION

General GSLB Configuration

Below you can find the configuration steps needed for the GSLB Labs

- DNS Responder

Virtual service responsible for replying GSLB decision to clients



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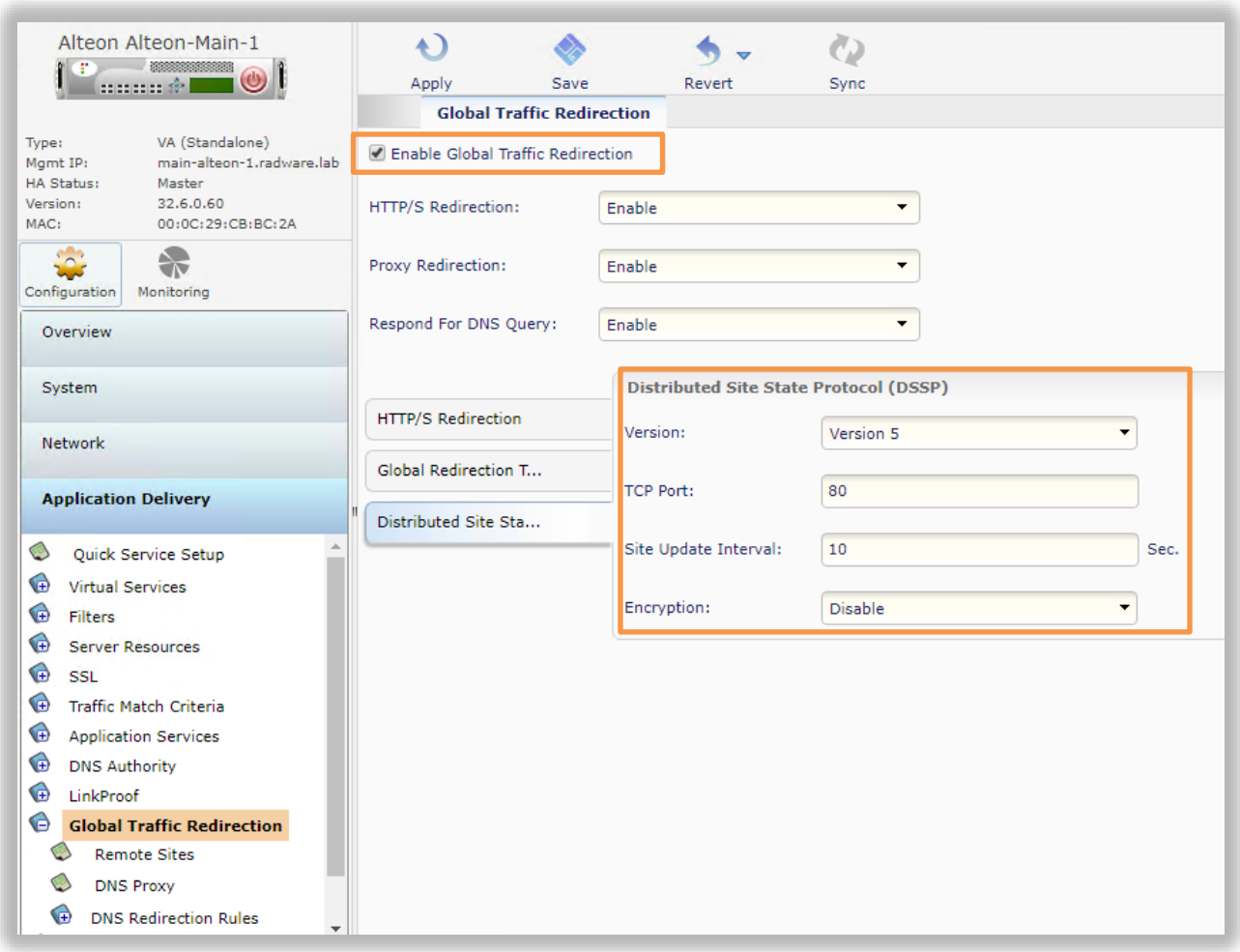
- GSLB and DSSP Settings

Distributed Site State Protocol (DSSP) is used to exchange metric and statistic information between the GSLB sites. GSLB should be enabled and DSSP settings must be identical on all devices



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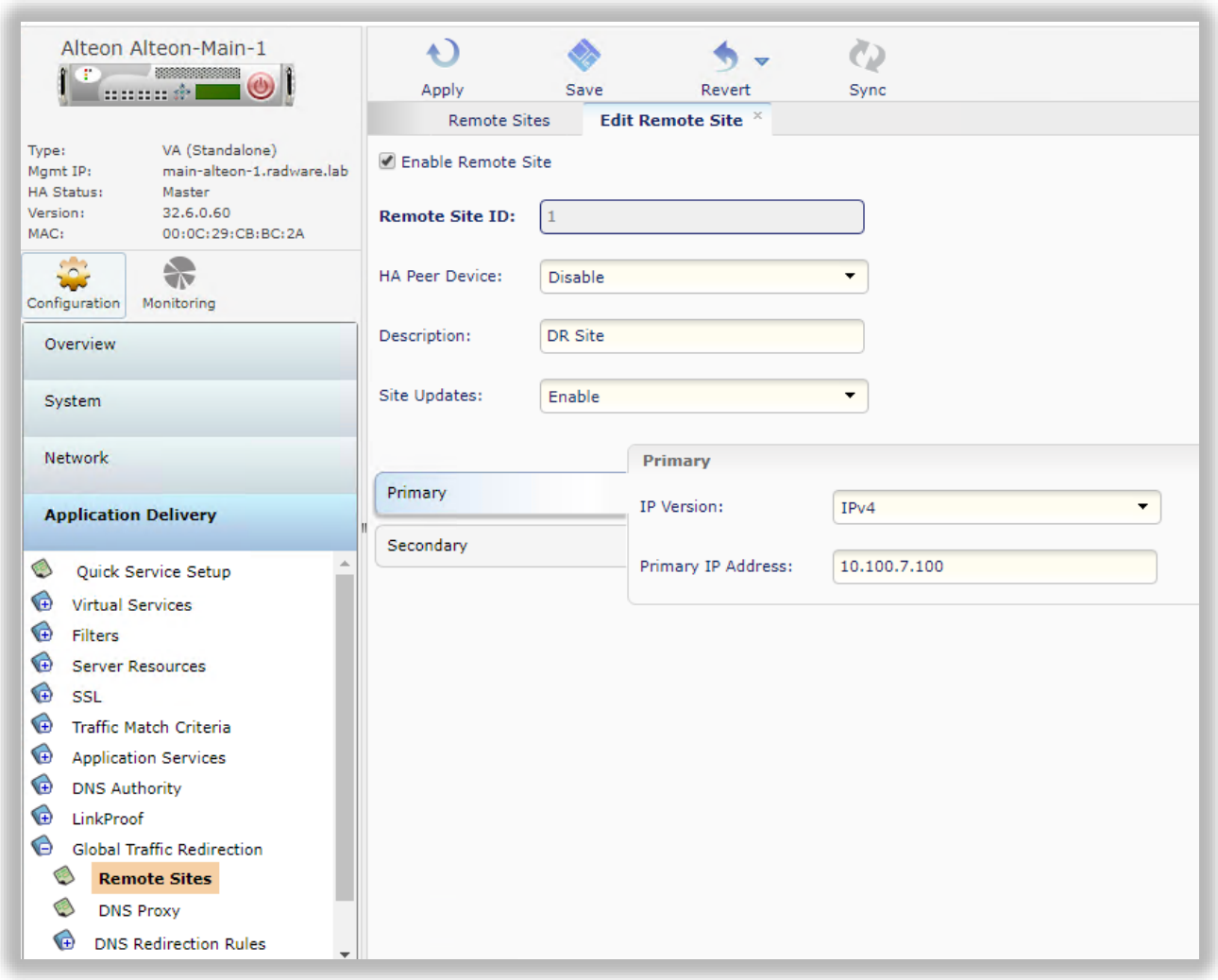
- Remote site settings

Remote site is the representation of the GSLB in the remote sites



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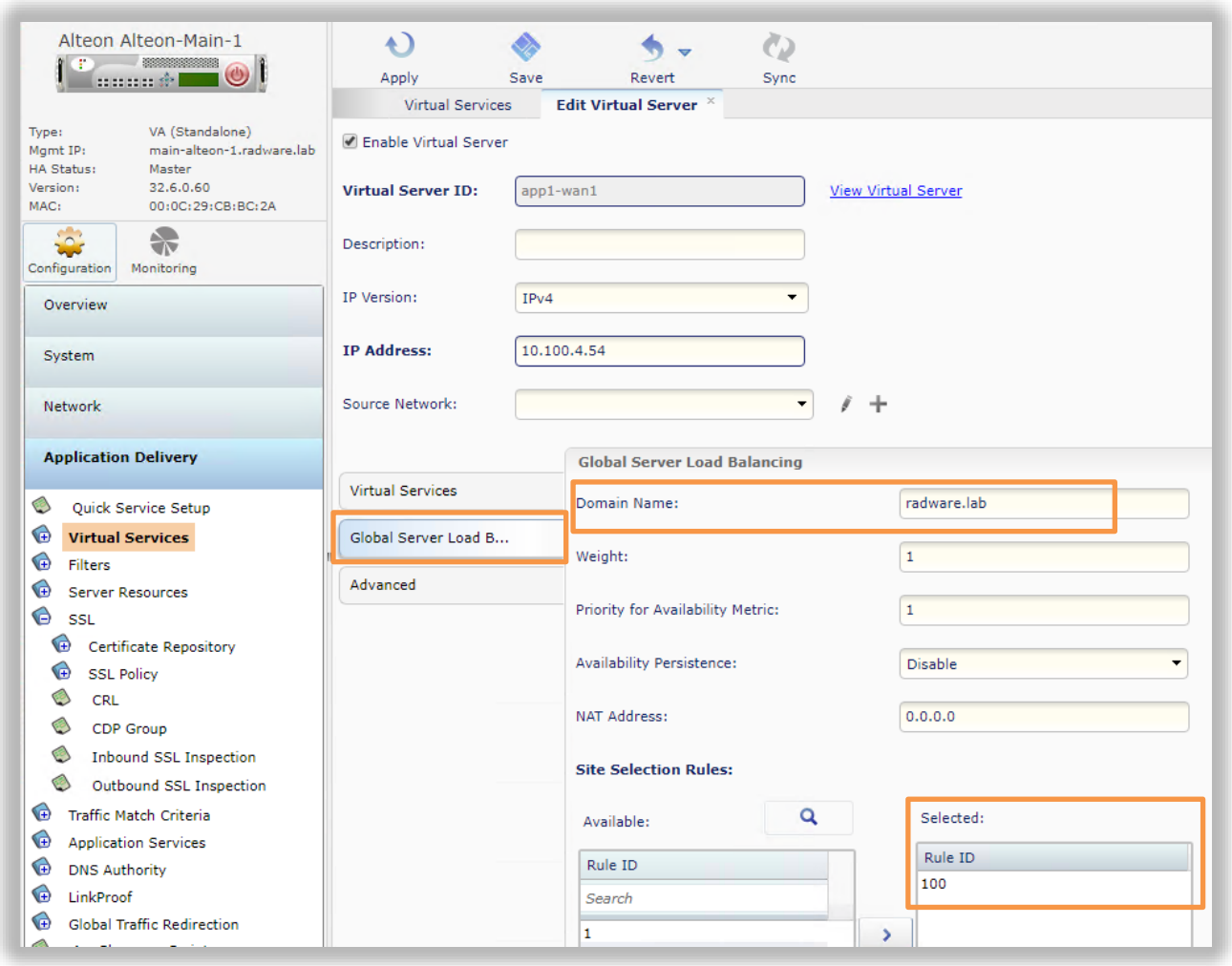
- Virtual Servers GSLB configuration

Make sure relevant virtual servers have "Domain Name" configured and at least one selected "Site



Selection Rule"

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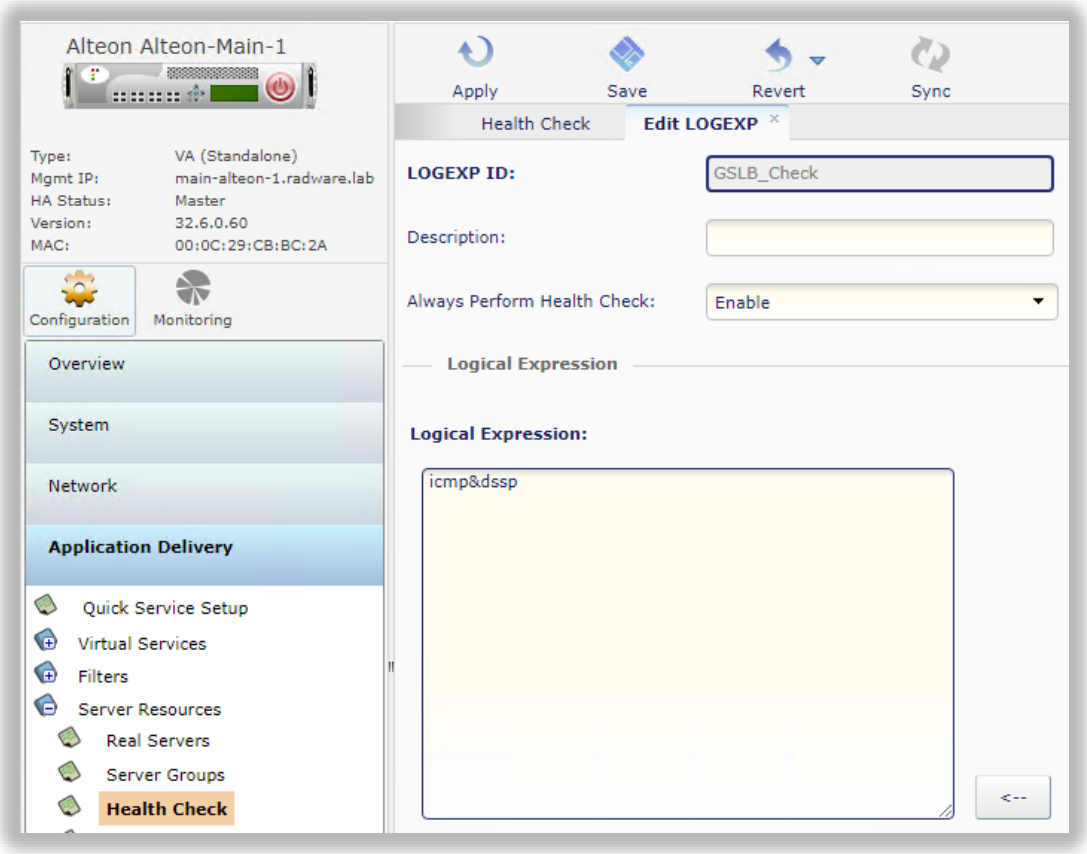
- GSLB health check

To get awareness of remote sites service status we must use DSSP health check. To get a faster and more accurate reading it is recommended to combine the DSSP with ICMP health check. Create Logical expression health check for the GSLB objects



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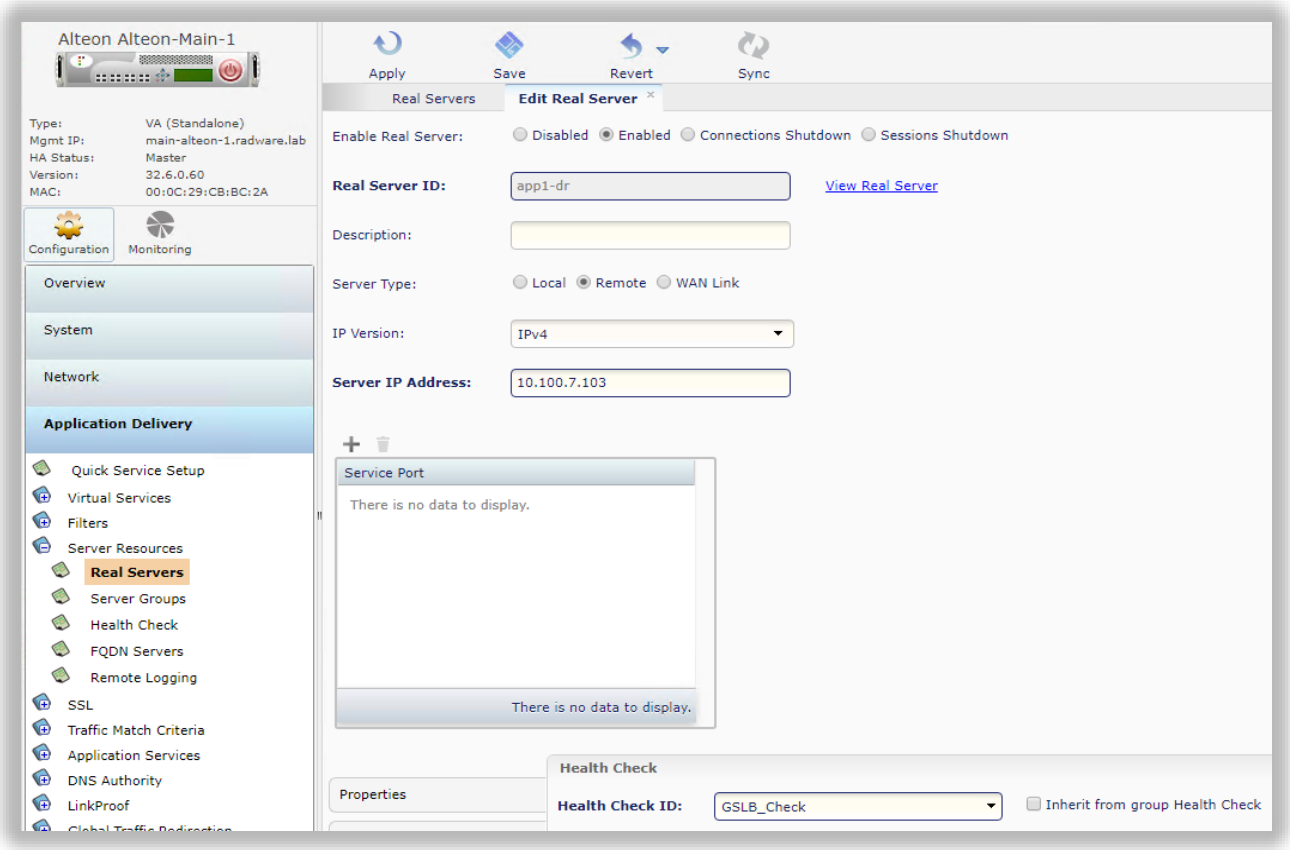
- Remote Real Server

All relevant opposite site virtual servers should be configured as real servers while the type should be remote and health check should be set either to DSSP or the health check from (1.2)



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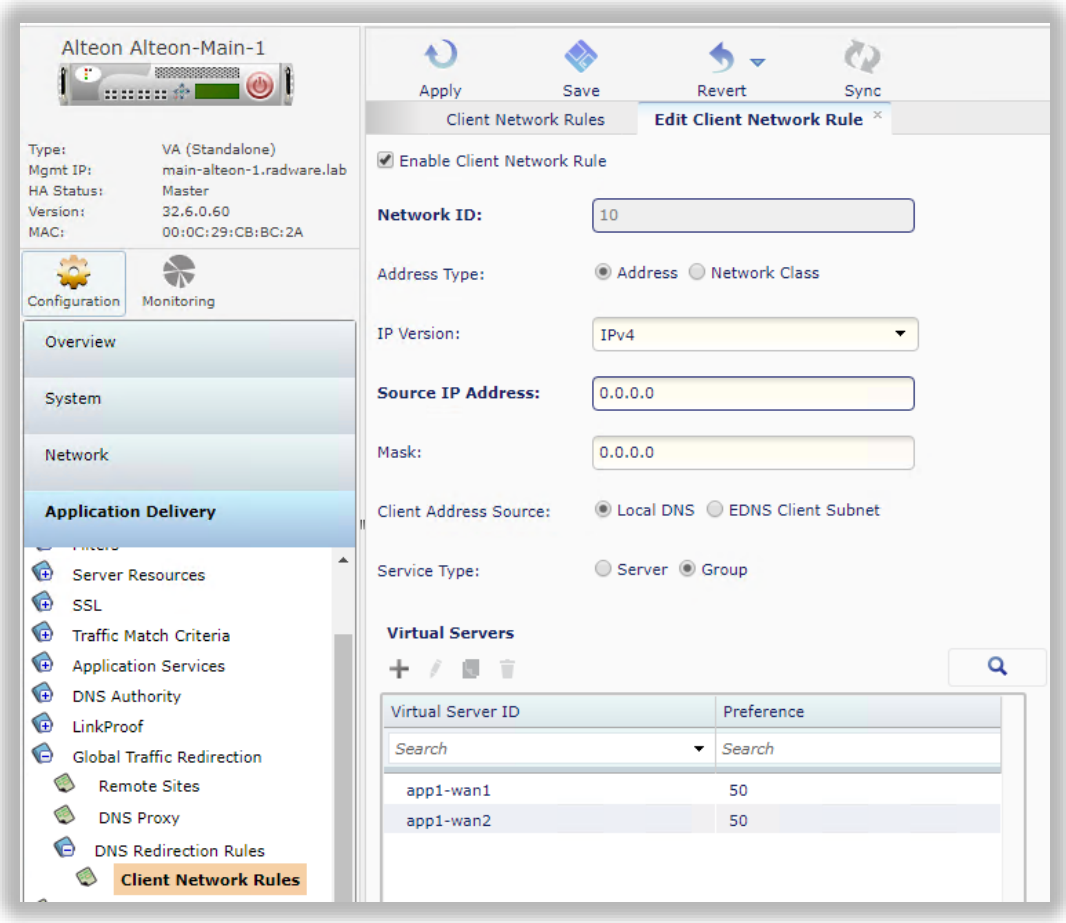
GSLB Scenario 1 Configuration

- Client Network Rules

Create a network rule for definition of acceptable IP's for GSLB to reply, in the example below Network 10 contains Virtual servers "app1-wan1" and "app1-wan2" and remote real server "app1-dr"



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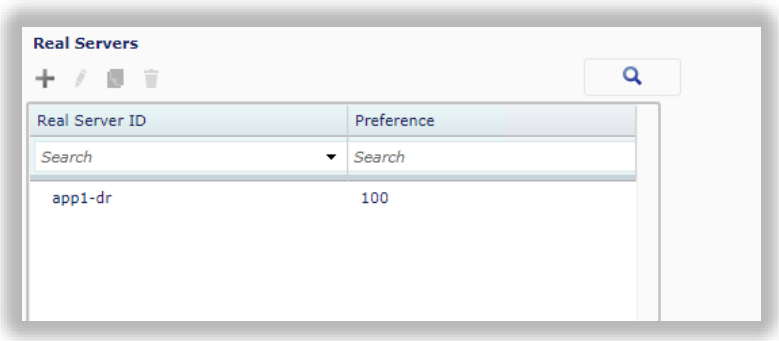
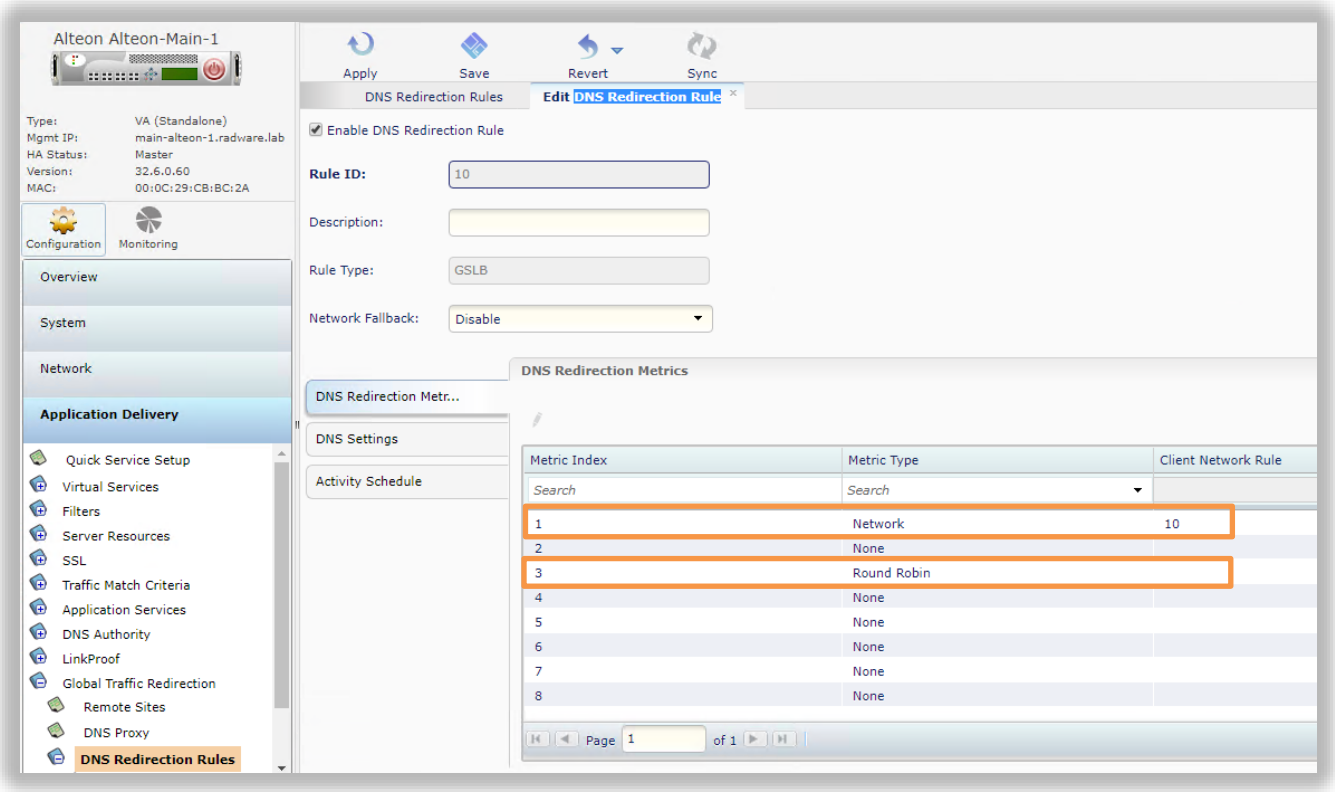


Back to the Demo

- DNS Redirection Rule - Metrics

Configure the metrics used for this rule, use metric 1 for associating the network rule (2.1) and metrics 3-8 for setting the distribution, in this case Round Robin



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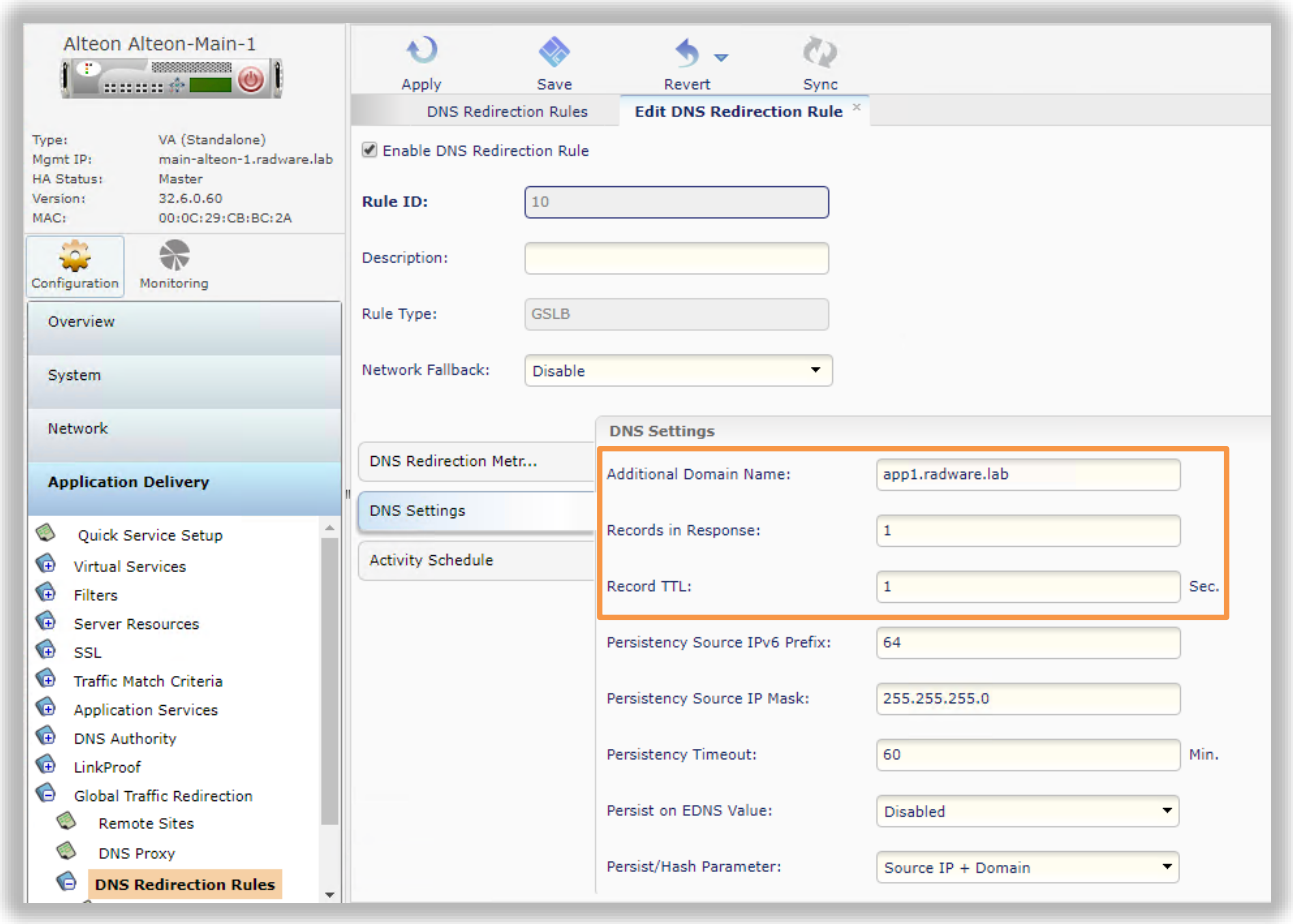
- DNS Redirection Rule - DNS Settings

Configure the hostname as the Additional Domain Name, set the TTL to 1 and adjust how many records we need per response



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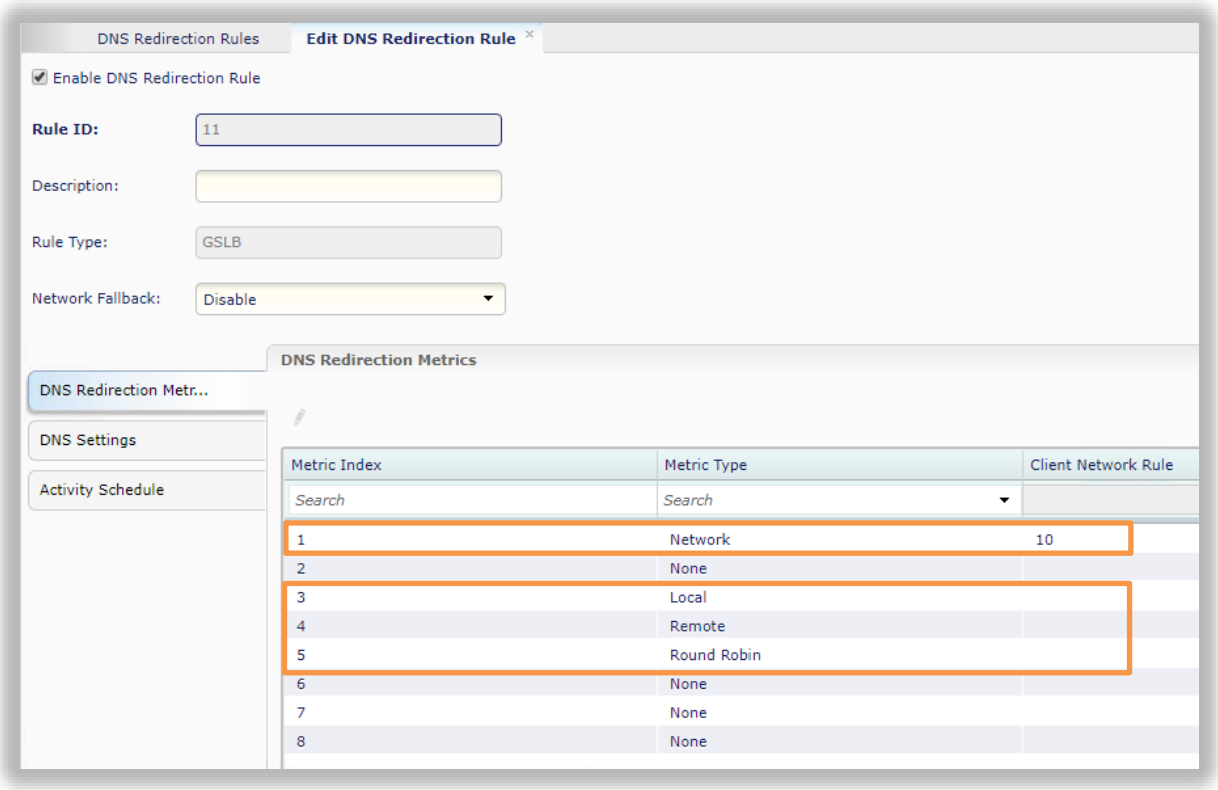
GSLB Scenario 2 Configuration

- DNS Redirection Rule

Use "Local" metric to first prefer the local VIPs, then add "Remote" and finally "round robin"



GSLB will check the rules top to bottom until it gets enough IP's (according to the DNS settings).

1.1. DNS Redirection Rule

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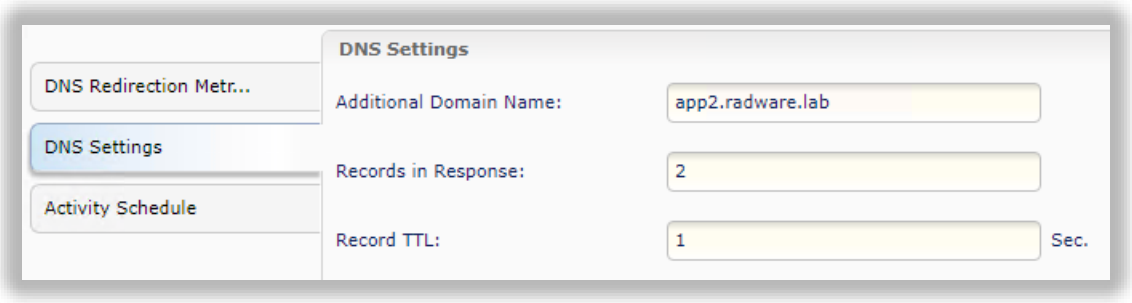
Configure the hostname as the Additional Domain Name, set the TTL to 1 and adjust how many records we need per response



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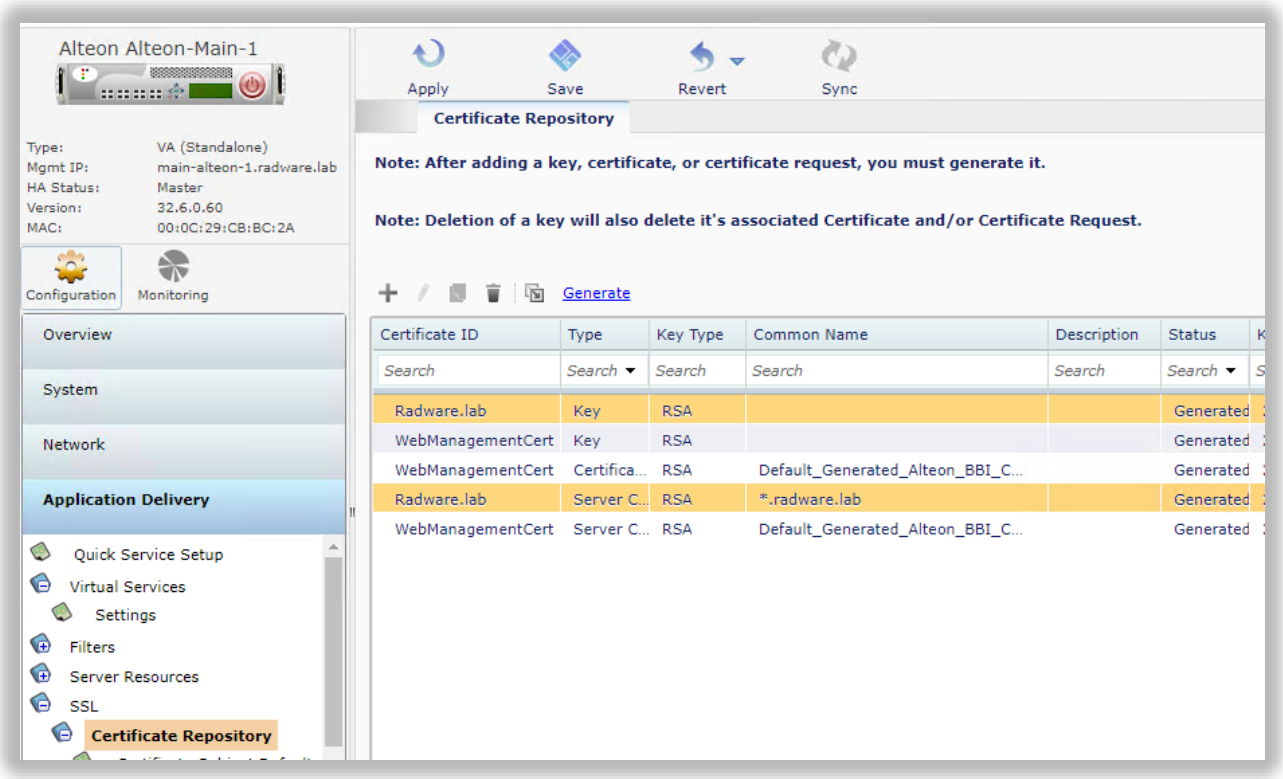
APPENDIX 2 – SSL OFFLOADING AND LAYER 7 MODIFICATION CONFIGURATION

SSL Offload

- SSL Certificate + Key for performing the SSL\TLS negotiation.



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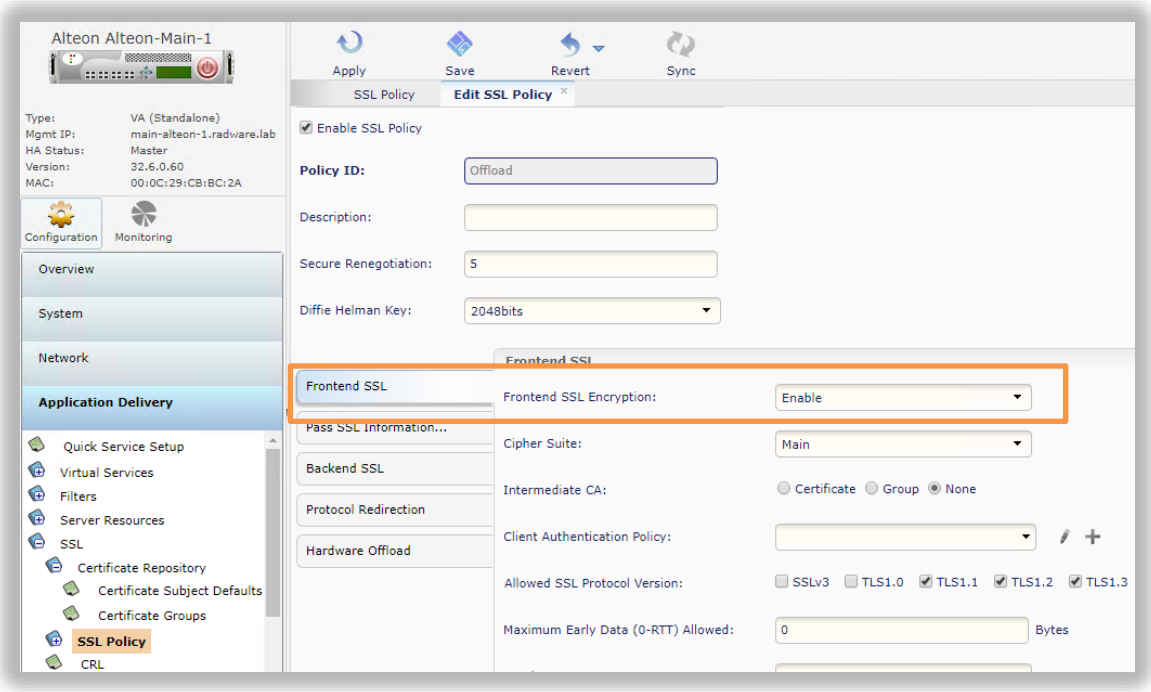
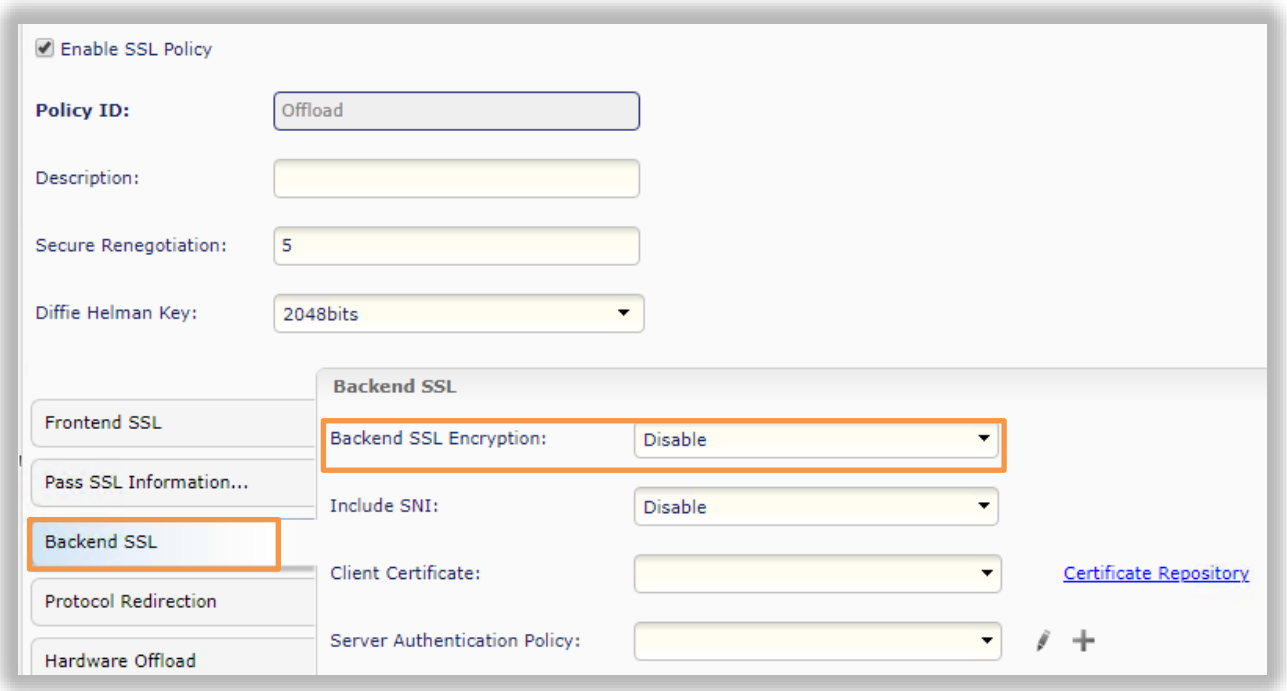
- SSL policy

  Frontend SSL encryption should be enabled, and Backend SSL disabled





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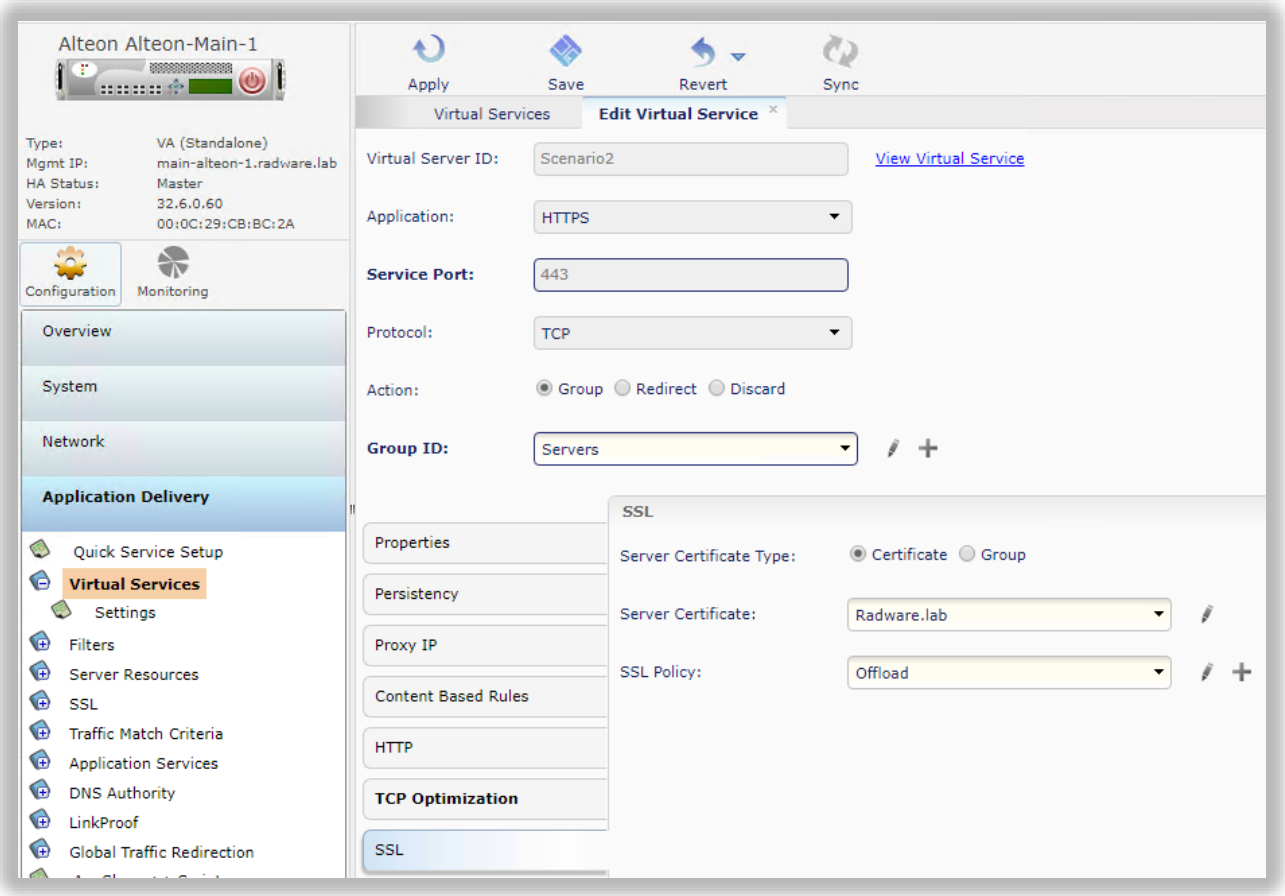
Virtual Service

The virtual service should be configured with appropriate service port (for HTTPS) and real service port (for HTTP), relevant group and assigned with SSL certificate and SSL policy.



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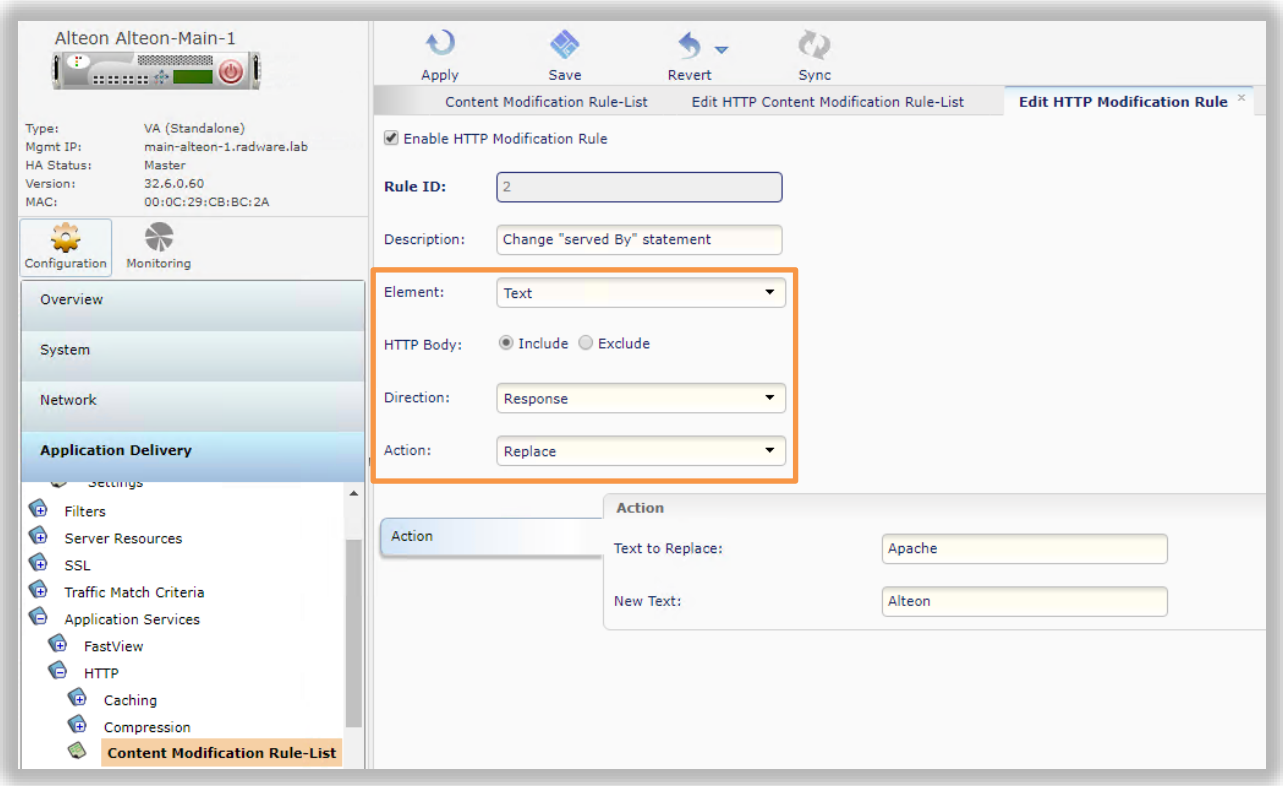
HTTP Body Modification

Please note: for HTTP body modification to function, Alteon must be able to "understand" the HTTP payload, meaning if the service is HTTPS, need to perform SSL offload or SSL Termination, in case the traffic is compressed need to perform compression.

- HTTP Modification Rule

HTTP modification rule list should contain a rule with the following characteristics - perform text modification, include the HTTP body, direction set to response and action is "Replace".



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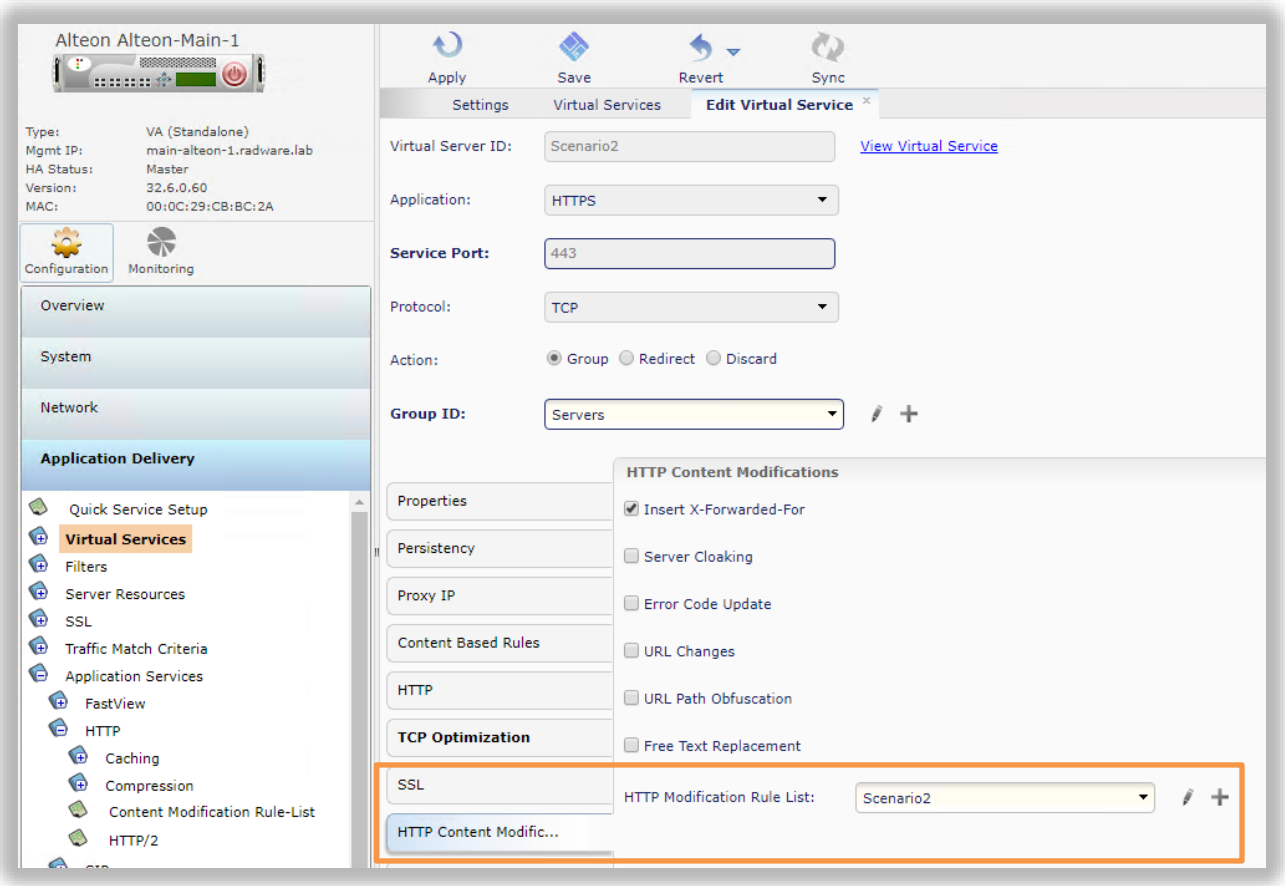
- Virtual service

HTTP modification list should be assigned to the virtual service



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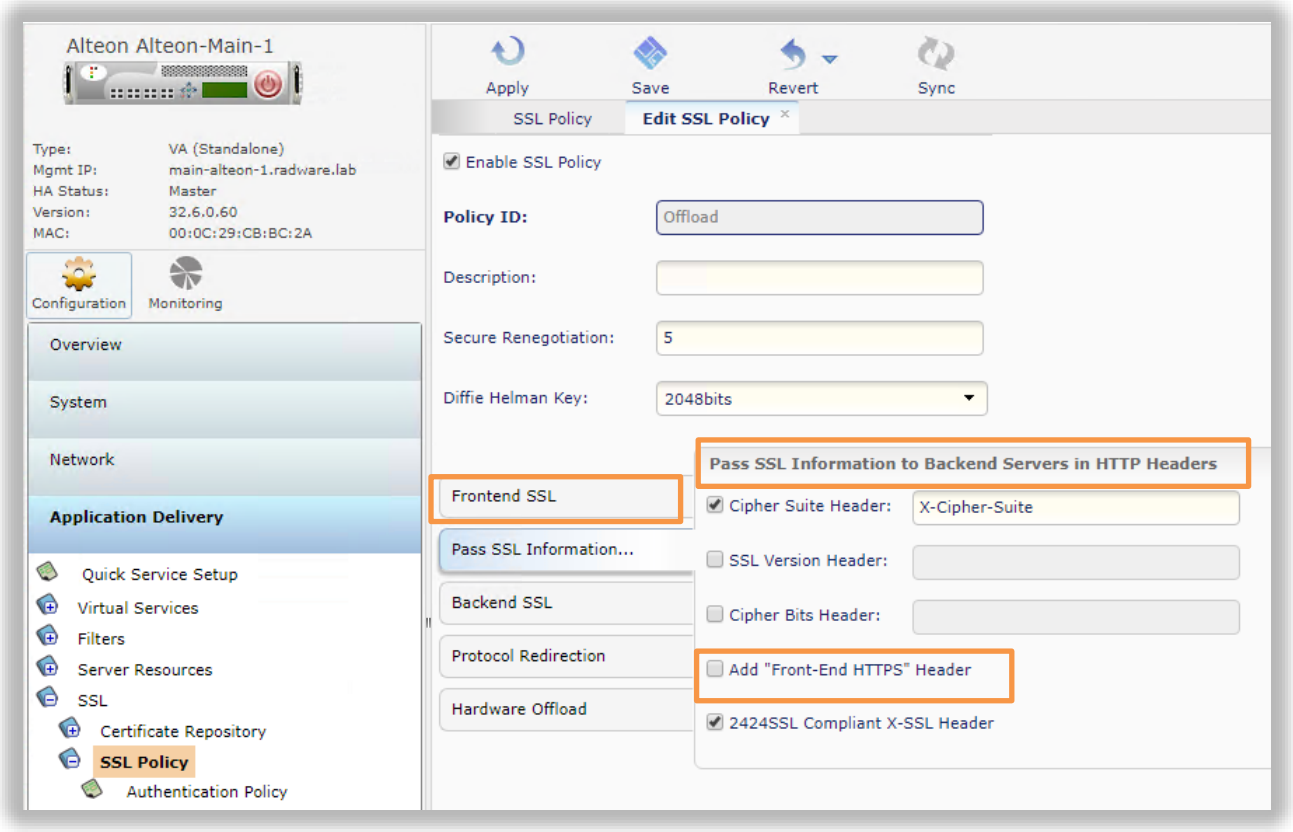
HTTP Header Modification

- SSL Policy HTTPS headers

Cipher suite header and X-SSL header as part of the "Pass SSL Information to Backend Servers in HTTP Headers" section of the SSL Policy should be checked



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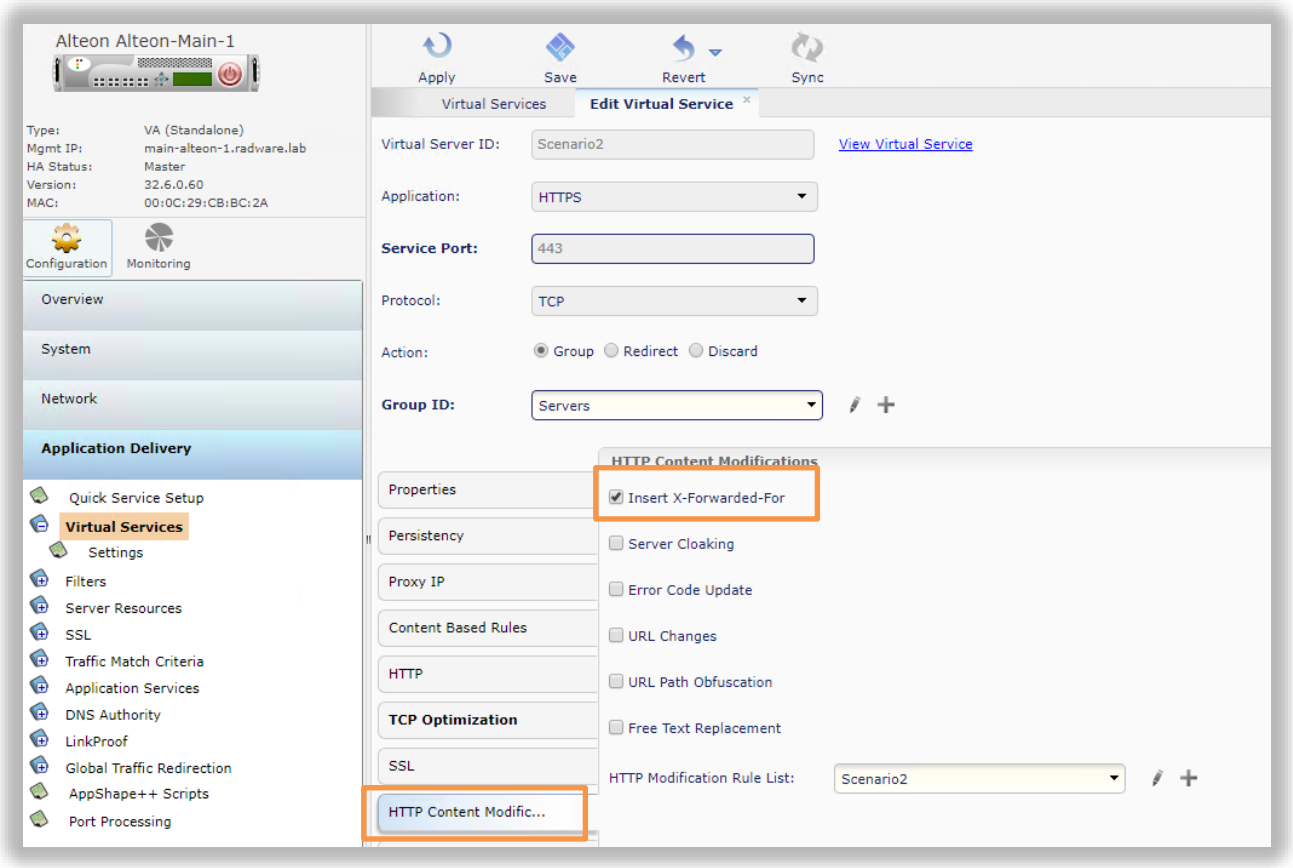
- Virtual Service

X-Forwarded-For Header injection as part of the HTTP Content Modifications of the Virtual server should be marked



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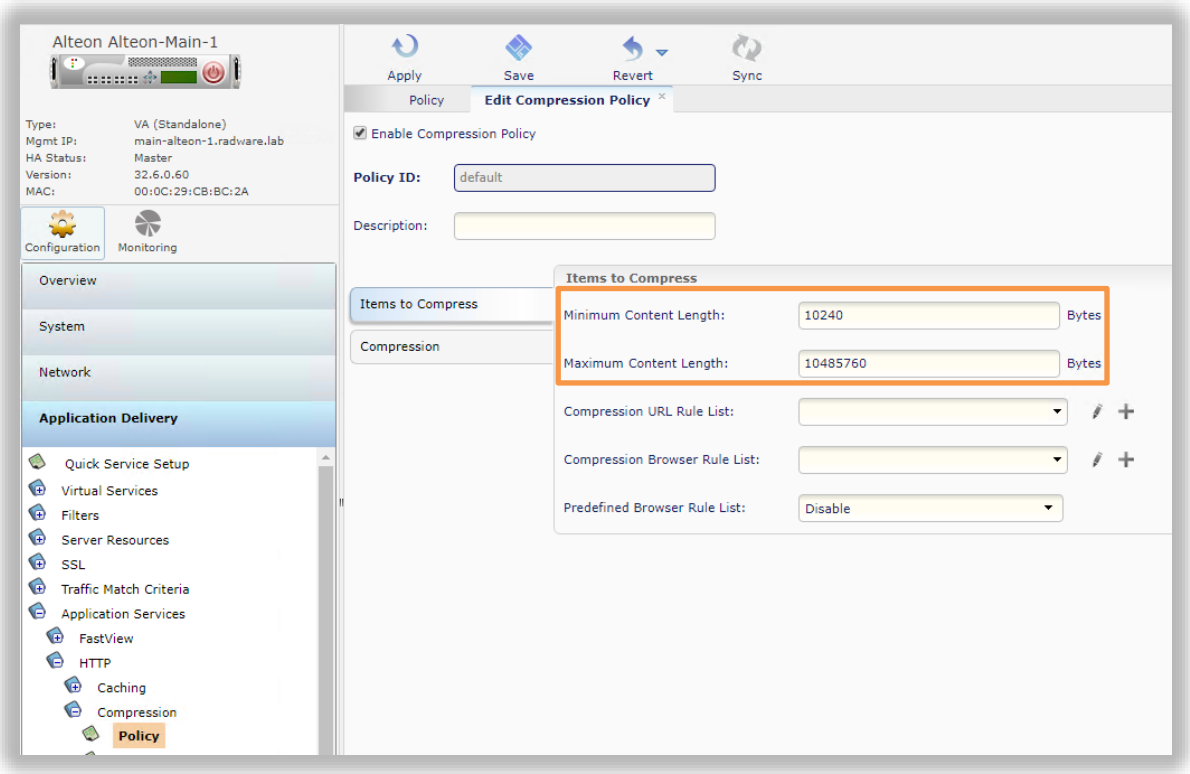
HTTP Compression Offload

- Compression policy

Create a new compression policy, if needed adjust minimum\maximum content length (for this demo default values are enough)



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And make sure "Real Server Compression" as part of the compression section is disabled.

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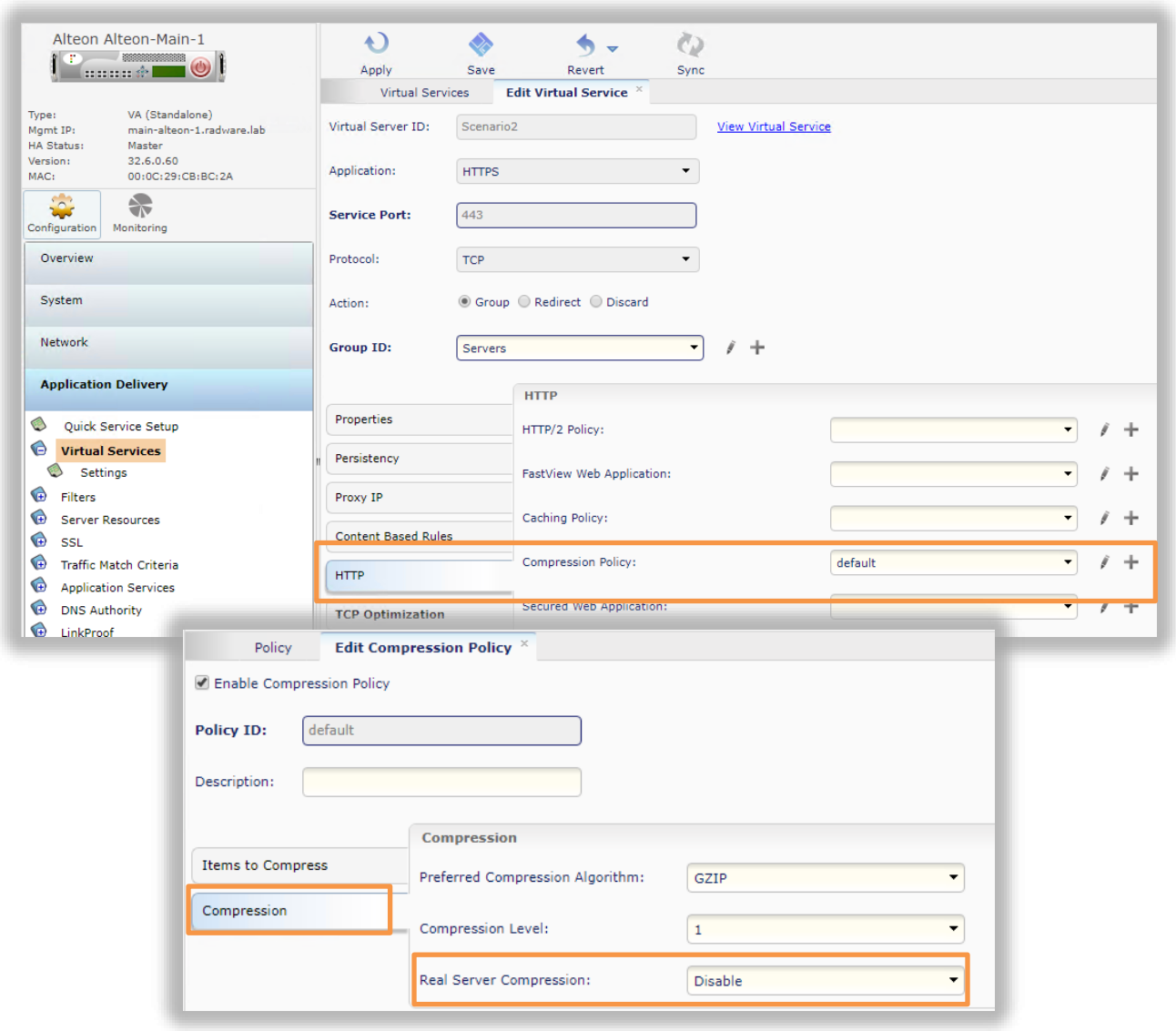
- Virtual Server



The compression policy should be assigned to the Virtual server

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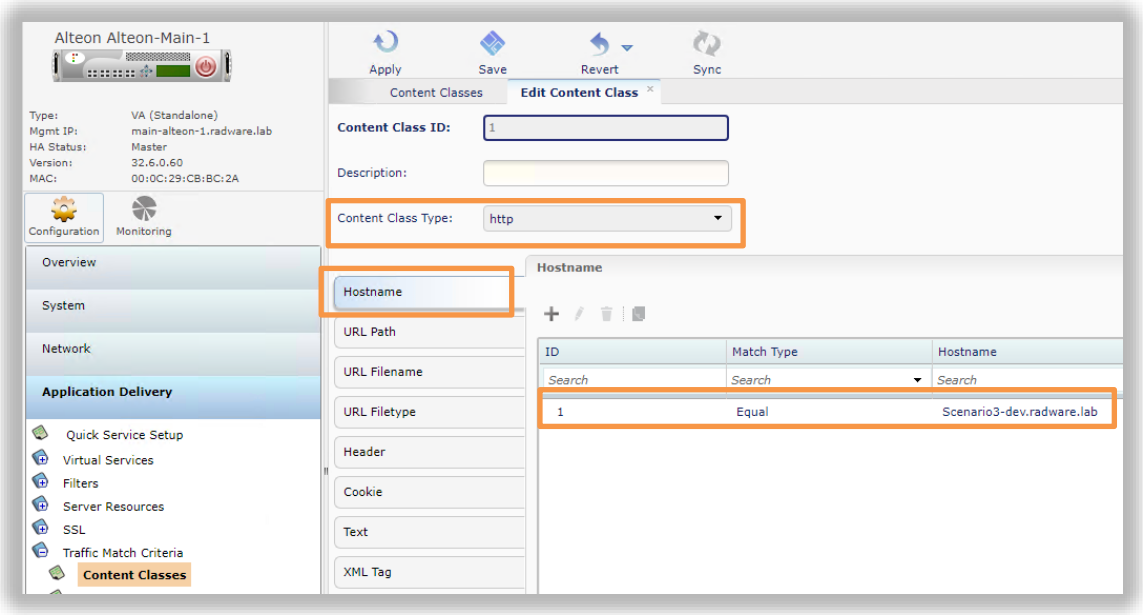
APPENDIX 3 – CONTENT BASED LB

HTTP Content Based Rules

- Content Class

Configure match criteria using HTTP type content class, in this example match based exact match of the hostname



- Virtual Service

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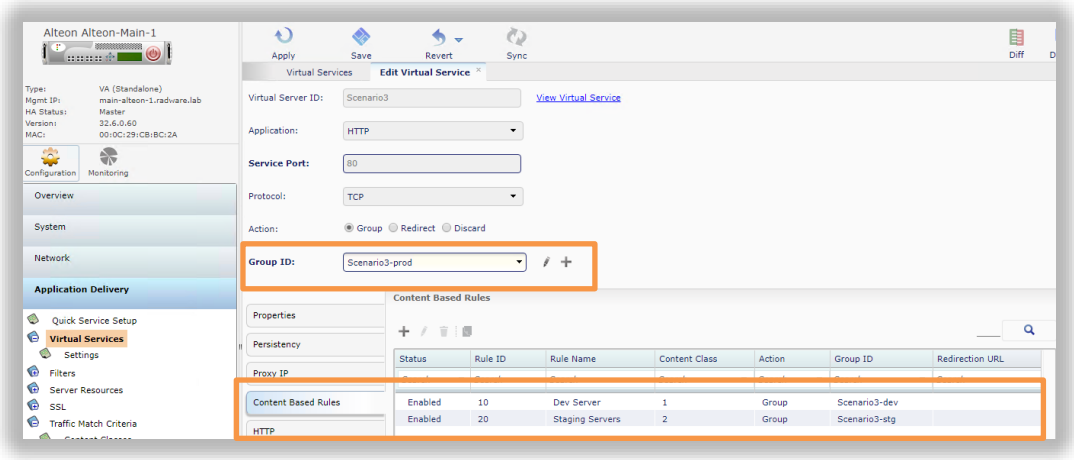
Associate the content class to a content rule with "group" as the action, note the group associated to the service is the default action (if no rule is matched).



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SNI (SSL\TLS) Based rules

Importing a script for parsing the SSL\TLS and selecting the group based on the SNI

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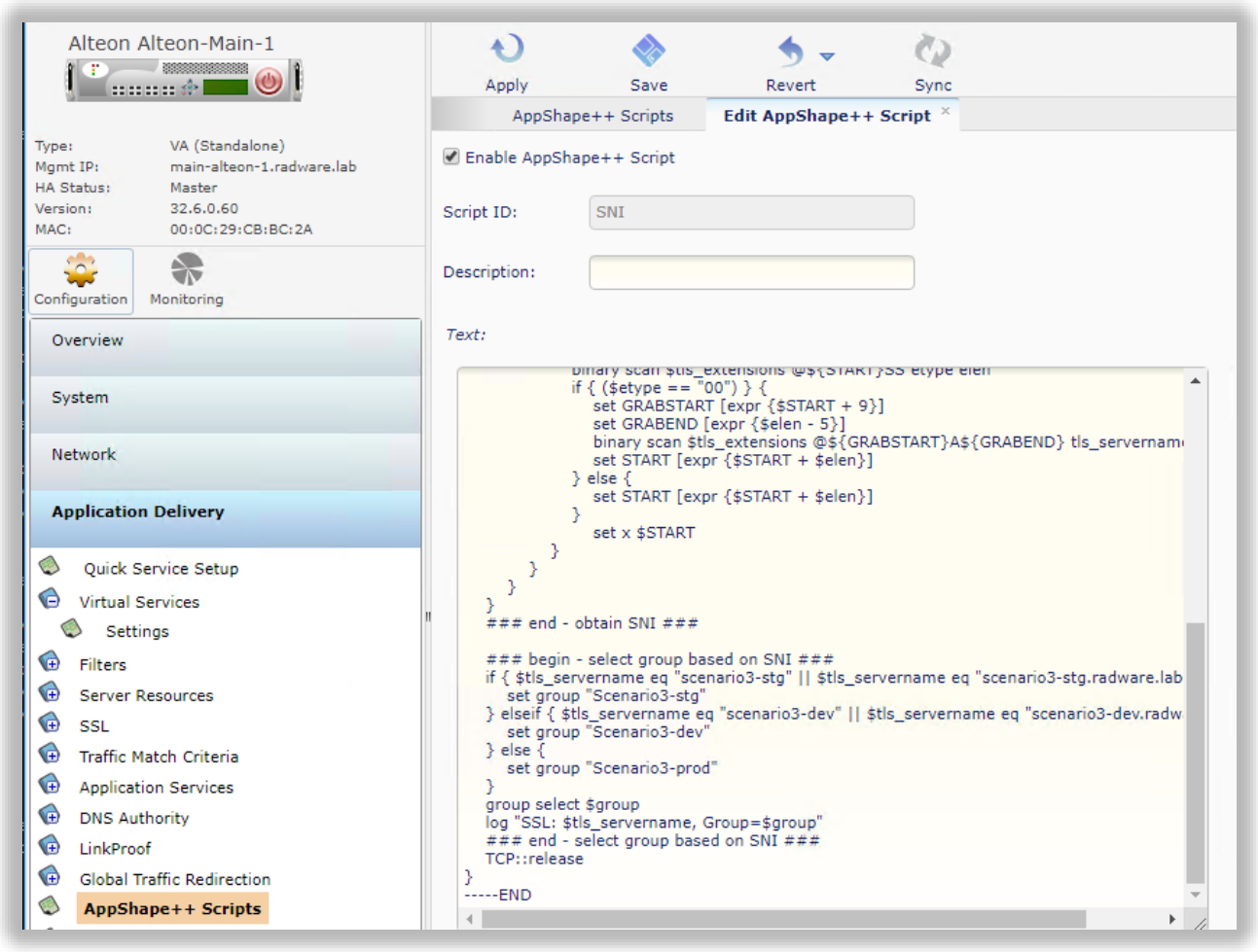
The script can be found here:



https://support.radware.com/app/answers/answer_view/a_id/21507/loc/en_US

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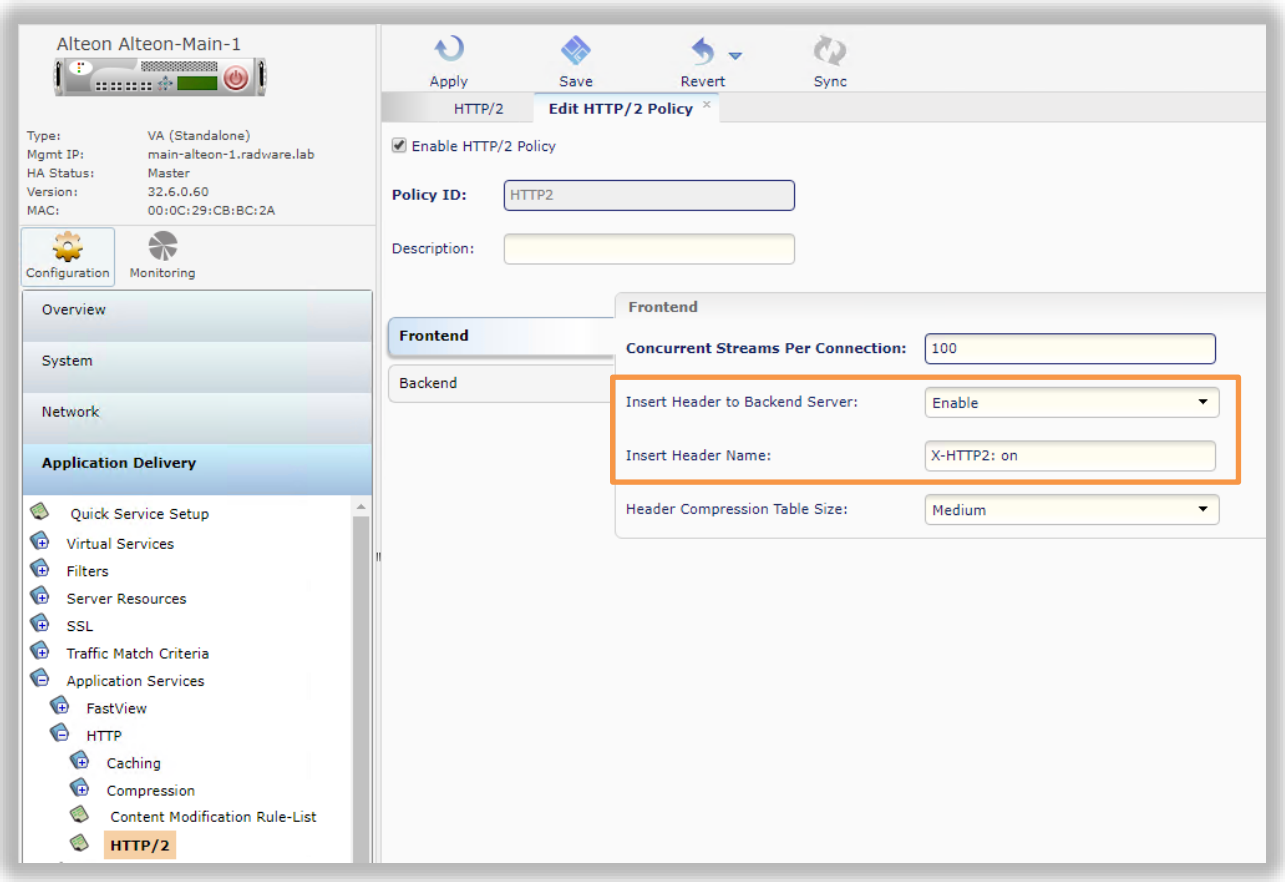
APPENDIX 4 – HTTP/2.0 GW

Creating an HTTP2 policy, enable Header insertion for notifying the server, rest of the setting can remain on their default values. And assign the policy to the virtual service



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