radware

Alteon
34.x

Alteon Level 1 Lab Manual Content Based SLB

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Overview

Alteon blends traditional server load balancing with advanced, application-aware Layer 7 switching to support the design of a highly scalable, optimized application delivery system.

Layer 7 load balancing allows for increased efficiency of the application infrastructure. Layer 7 switching directs its requests at the application layer. It differs from Layer 4 load balancing in a fundamental way because the servers do not to replicate the same content, but effectively "pass the parcel". This allows for fine tuning.

This lab uses Layer 7 switching to differentiate traffic and make forwarding decisions based on content.
Using the Alteon and a browser, we define different content-based situations and see how the traffic is forwarded when content is triggered.

In this lab we distinguish between different browsers. We will create a content class to configure the Alteon to send traffic to different servers based on the browser requesting content. At the end of this lab, content load balancing scenarios are offered so you can practice your skills.

IMPORTANT: When creating a new content class in a virtual service, be sure to remove unwanted content classes.

Objectives

After completing this lab, you should be able to:

- Define content rules for different URL paths.
- Distinguish between different browsers.
- Optional: Use regular expressions to create complex matches.

Lab Preparations: Restore Standard Setup

Before you begin this lab:

a. You should have successfully completed ADC server load balancing setup (HTTP and HTTPS services).
b. Access Alteon management port and login.
    i. Set the group metric to Round Robin
    Configuration → Application Delivery → Server Resources → Server Groups → Edit Group1 → Group Setting → SLB Metric
    ii. Disable persistent binding (pbind). PBind takes precedence over string load balancing.
    Configuration → Application Delivery → Virtual Services → Edit Virtual Service(s) → Persistency → Persistence Mode
c. Verify your SLB SETUP is properly working before going on.

Lab Activities

Here is a summary of what you will be doing in lab:

1. Configure Content SLB – URL Path
2. Configure Content SLB – browser
3. Optional: Configure Regular Expression Configuration

Content SLB – URL Path

Content load balancing based on URL path string selection.

1. Create a new, unique content class.
   HINT: A class may contain multiple elements. Each element requires a unique ID.
   a. Content Class ID: IMAGES
   b. Class Type: http
   c. Path ID: images
   d. Path: images

 **GUI:**

Configuration à Application Delivery à Traffic Match Criteria à Content Classes

Click “+” to add new content class

- Content Class ID: IMAGES
- Content Class Type: http
- URL Path tab:
  - Click “+” to add new URL Path
  - ID: images
  - Path: images

2. Create a new server group to support the defined content class.
   a. Server Group ID = Images
      i. Add WebServer2 to the new server group.
   b. Create an advanced health check for the group.
      i. Health Check Type: HTTP(S)
      ii. Health Check ID: img1
      iii. Destination Port: 80
      iv. Path: images/img1.jpg
      v. Hostname: www.radware.lab
   c. Assign new health check to the group.
   d. Apply, synchronize, and save the configuration
   e. Verify server group Images is operational (UP)

a) **Configuration → Application Delivery → Server Resources → Server Groups**
b) Click “+” to add a new group
   - Server Group ID: Images
   - Real Servers tab: add real server WebServer2 to the Selected
   - Group Setting tab: Health Check: img1
   - Submit
c) Apply
d) Save
e) Sync
f) **Configuration → Overview → Service Status View**

3. Enable Content Rule SLB for the virtual service IP address.
    a. Content based service rule number: 10
    b. Content Class: IMAGES
    c. Group: Images

a) **Configuration → Application Delivery → Virtual Servers**
b) Edit the virtual server Virt1
c) Virtual Services tab
    1. Edit the virtual service HTTP
    2. **Content Based Rules** tab
        - Click "+" to add a Content Based Rule
        - Rule ID: 10
        - Content Class: IMAGES
        - Group ID: Images
        - Submit
    3. Close

d) Close
e) Apply
f) Save
g) Sync

4. Enable statistics collection for Content Rules.
   (By default, this is already enabled in Alteon version 32.x.)

a) **Configuration → Application Delivery → Virtual Services → Settings**
b) **Statistics** tab
   Per Service Statistics: Enable
c) Submit, Apply, Save, Sync

Validate Your Configuration

Verify using Statistics

a. Generate test traffic to the VIP for web servers.
b. Use browser to http://www.radware.lab/ and http://www.radware.lab/images/img1.jpg
c. Verify the configuration and check the working status.
   HINT: Close and reopen the browser several times.
   View the statistics in the Alteon to verify activity.

CLI:

```
/st/slb/virt Virt1 80 all
Virtual server Virt1 stats:
Virtual server Virt1 service http
Fallback action:
Action: group Group1
Real ID          IP Address               Current      Total    Highest Throughput   Total BW        CPS Server RTT
                                         Sessions   Sessions   Sessions     [Kbps]       [Mb]                 [ms]
-------          ----------             --------   --------   --------  ---------  ---------  ---------  ---------
WebServer1       10.200.1.100                  1          4          1                 0.293                 0.00
WebServer2       10.200.1.200                  0          0          0                     0                 0.00
-------          ----------             --------   --------   --------  ---------  ---------  ---------  ---------
                                               1          4          1          0      0.293          0       0.00
Content Rule 10:
```

```
Action: group Images
Real ID          IP Address                Current      Total    Highest Throughput   Total BW        CPS Server RTT
                                          Sessions   Sessions   Sessions     [Kbps]       [Mb]                 [ms]
-------          ----------              --------   --------   --------  ---------  ---------  ---------  ---------
WebServer2       10.200.1.200                   0          3          1                  4.301                  1.5
-------          ----------              --------   --------   --------  ---------  ---------  ---------  ---------
                                                0          3          1          0       4.301          0        1.5
```

If you do not get expected results after refreshing page by <ctrl>F5, check cache in browser is cleared.

- Chrome: settings → clear browsing data
- FireFox: settings → clear data

Access the image file from the client web browser.

NOTE: Image files on WebServer2 are: img1.jpg, img2.jpg, and img3.jpg. Close/reopen browser several time to http://www.radwarelab/images/img1.jpg

 **CLI:**

```
/st/slb/virt Virt1 80 all
```

Content SLB – Browser

Content Server Load Balancing based on the User Agent (browser type).

IMPORTANT: Before you begin this exercise, be sure SLB setup is verified.

As a student, you have multiple browsers on your RDP PC. In this exercise we are using the content server load balancing to send the user of different browsers to different groups.

1. Identify the information you can use in content SLB.
    a. Access your VIP with two different browsers, Firefox and Chrome.
    b. Review the information displayed on the page displaying your browser information “Your browser is:”
    c. Identify the information that can be used in the content SLB to identify the browser. For example:
        i. Firefox has a string “Firefox”
        ii. Chrome has a string “Chrome”
        iii. Don’t use something too specific like “Chrome/89.0” because it will only match a specific version of Chrome.
2. Configure the content class for the two browsers.
    a. Configure content class for Firefox

Parameter	Value
Content Class ID	Firefox
Content Class Type	http
Header → ID	UserAgent
Header → Header Name Match Type	Equal
Header → Header Name	User-Agent
Header → Header Value Match Type	Include
Header → Header Value	Firefox
Header → Case-Sensitive Matching	Enable

GUI:

a) **Configuration → Application Delivery → Traffic Matching Criteria → Content Classes**
b) Click “+” to add a content class.
    - Content Class ID: Firefox
    - Content Class Type: http
    - **Header** tab
        - Click “+” to add a header
        - ID: UserAgent
        - Header Name Match Type: Equal
        - Header Name: User-Agent
        - Header Value Match Type: Include
        - Header Value: Firefox
        - Case-Sensitive Matching: Enable
        - Submit
    - Close
c) Apply
d) Save
e) Sync

b. Configure content class for Chrome

Parameter	Value
Content Class ID	Chrome
Content Class Type	http
Header → ID	UserAgent
Header → Header Name Match Type	Equal
Header → Header Name	User-Agent
Header → Header Value Match Type	Include
Header → Header Value	Chrome
Header → Case-Sensitive Matching	Enable

Repeat steps you did for Firefox with the values for Chrome.

3. Create two server groups to be used with the content-based rules:
   a. WebChrome – add WebServer1
   b. WebFirefox – add WebServer2

4. Configure the content-based load balancing inside the virtual service.
   a. For Firefox

Parameter	Value
Enable Content-Based Rule	Checked
Rule ID	20
Rule Name	Firefox to group WebFirefox
Content Class	Firefox
Action	Group
Group ID	WebFirefox

GUI:

- **Configuration → Application Delivery → Virtual Services**
- Edit the Virtual Server
  - Edit the Virtual Service
  - Content Based Rules tab
    - Add a Content based Rule
    - Enable the new content based rule
    - Rule ID: 20
    - Rule Name: Firefox to group WebFirefox
    - Group ID: WebFirefox
    - Submit
  - Submit
- Close
- Apply
- Save
- Sync

b. For Chrome

Parameter	Value
Enable Content-Based Rule	Checked
Rule ID	30
Rule Name	Chrome to group WebChrome
Content Class	Chrome
Action	Group
Group ID	WebChrome

Repeat the operations for Chrome browser content-based rule.

Validate Your Configuration

Verify – Statistics

d. Generate test traffic to the VIP for web servers using Chrome and Firefox.
   i. Use browser to http://www.radware.lab/
e. Verify the configuration and check the working status.
   Close and reopen the browser several times.
   i. View the statistics in the Alteon to verify activity.

CLI:

```
/st/slb/virt Virt1 80 all
Content Rule 30:
Action: group WebChrome
Real ID          IP Address               Current      Total    Highest Throughput   Total BW        CPS Server RTT
                                         Sessions   Sessions   Sessions     [Kbps]       [Mb]                  [ms]
-------          ----------             --------   --------   --------  ---------  ---------  ---------  ---------
WebServer1       10.200.1.100                1          1          1                   0.326                  0.00
-------          ----------             --------   --------   --------  ---------  ---------  ---------  ---------
                                                1          1          1          0       0.326          0       0.00
```

```
>> Alteon-A - Server Load Balancing Statistics# /stats/slb/virt Virt1 80 all
----------------------------------------------------------------
Virtual server Virt1 stats:
Virtual server Virt1 service http
Fallback action:
Action: group Group1
Real ID          IP Address               Current     Total    Highest Throughput   Total BW        CPS Server RTT        PPS
                                         Sessions   Sessions   Sessions     [Kbps]      [Mb]                 [ms]
-------          ----------               --------   --------   --------  ---------  ---------  ---------  ---------  ---------
WebServer1       Web Application Server          0          0          0                     0                  0.00          0
                  1
WebServer2       Web Application Server          0          0          0                     0                  0.00          0
                  2
-------          ----------               --------   --------   --------  ---------  ---------  ---------  ---------  ---------
                                                 0          0          0          0          0          0       0.00          0
Content Rule 10:
Action: group Images
Real ID          IP Address               Current     Total    Highest Throughput   Total BW        CPS Server RTT        PPS
                                         Sessions   Sessions   Sessions     [Kbps]      [Mb]                 [ms]
-------          ----------               --------   --------   --------  ---------  ---------  ---------  ---------  ---------
WebServer2       Web Application Server          0          0          0                     0                  0.00          0
                  2
-------          ----------               --------   --------   --------  ---------  ---------  ---------  ---------  ---------
                                                 0          0          0          0          0          0       0.00          0
Content Rule 20:
Action: group WebFirefox
Real ID          IP Address               Current     Total    Highest Throughput   Total BW        CPS Server RTT        PPS
                                         Sessions   Sessions   Sessions     [Kbps]      [Mb]                 [ms]
-------          ----------               --------   --------   --------  ---------  ---------  ---------  ---------  ---------
WebServer2       Web Application Server          1          5          1          8      0.068                  0.00          6
                  2
-------          ----------               --------   --------   --------  ---------  ---------  ---------  ---------  ---------
                                                 1          5          1          8      0.068          0       0.00          6
Content Rule 30:
Action: group WebChrome
Real ID          IP Address               Current     Total    Highest Throughput   Total BW        CPS Server RTT        PPS
                                         Sessions   Sessions   Sessions     [Kbps]      [Mb]                 [ms]
-------          ----------               --------   --------   --------  ---------  ---------  ---------  ---------  ---------
WebServer1       Web Application Server          1          1          1                 0.511                  0.00          0
                  1
-------          ----------               --------   --------   --------  ---------  ---------  ---------  ---------  ---------
                                                 1          1          1          0      0.511          0       0.00          0
Service http summary statistics
```

Optional: Configure Regular Expression Configuration

Use a regular expression to select a real server.

1. Disable the current content rules to allow the new to match!
2. Continue with the configuration from the previous section.

   TIP: WebServer1 hosts “alteo.htm”. WebServer2 hosts “altea.htm” and “alter.htm”.

3. Create content class and content rules using regular expressions to select appropriate webservers.

   HINT: Regex "alte[ar].htm” allows selection of the content stored on web2. Inverting this regular expression avoids selection of this machine. Regex "alte[^ar].htm” allows access to “alteo.htm” and to many other “alteX.htm” pages. Skip any setup -- use default case value.

   a. WebServer1 content rule

Parameter	Value
Content Class ID	Alte1
Content Class Type	http
URL Filename → ID	alteo
URL Filename → Match Type	Regex
URL Filename → Filename	alte[^ar]

b. WebServer2 content rule

Parameter	Value
Content Class ID	Alte2
Content Class Type	http
URL Filename → ID	altear
URL Filename → Match Type	Regex
URL Filename → Filename	alte[ar]

First Rule: alte[^ar]
The regular expression **alte[^ar]** is designed to match any string that starts with "alte" followed by any character that is not 'a' nor 'r'. The notation **[^ar]** specifies a negated character class, meaning it looks for a character that is not in the specified set (**a** or **r**) right after "alte". Matching Examples:

- **alteo** - Matches because it follows "alte" with 'o', which is neither 'a' nor 'r'.
- **altez** - Matches because 'z' is neither 'a' nor 'r'.
- **alte1** - Matches because the digit '1' is not excluded by the negated character class.

Non-Matching Examples:

- **altear** - Does not match because it follows "alte" directly with 'a', which is explicitly excluded.
- **alter** - Does not match for the same reason as above, 'r' is excluded.

Second Rule: alte[ar]
The regular expression **alte[ar]** looks for matches of strings that start with "alte" immediately followed by 'a' or 'r'. Unlike the first rule, this expression employs a positive character class **[ar]**, explicitly including 'a' and 'r' as valid options for the character following "alte". Matching Examples:

- **altea** - Matches because 'a' is within the specified character set.
- **alter** - Matches because 'r' is also an accepted character according to the expression.

Non-Matching Examples:

- **alteo** - Does not match because 'o' is not included in the character class **[ar]**.
- **altez** - Does not match for the same reason, 'z' is neither 'a' nor 'r'.

4. Create two new server groups to support the defined regular expressions. Add one real server to each server group.

TIP: All real servers supporting string “alte[^ar].htm” need to be in a common group.

a. Create Server Group = alteo and add real server WebServer1.
b. Create Server Group = altear and add real server WebServer2.

5. Enable content class SLB for the real server group number.

Content Based Rules:

a. Alte1

Parameter	Value
Rule ID	40
Rule Name	alte1
Content Class	Alte1
Group ID	alteo

b. Alte2

Parameter	Value
Rule ID	50
Rule Name	alte2
Content Class	Alte2
Group ID	altear

Apply, Save, Sync.

6. Validate your configuration

Make sure other content rules are disabled so they do not interfere with these.

a. Verify configuration by generating test-traffic to your web servers. Test your configuration using PC to send requests.
   i. http://www.radware.lab/alteo.htm
   ii. http://www.radware.lab/alter.htm
   iii. http://www.radware.lab/altea.htm

b. Verify the configuration and check the working status.
   i. Close and reopen the browser several times.
   ii. View the statistics in the Alteon to verify activity.

CLI:

```
>> Alteon-A - Server Load Balancing Statistics# /stats/slb/virt Virt1 80 all
------------------------------------------------------------------
Virtual server Virt1 stats:
Virtual server Virt1 service http
Fallback action:
Action: group Group1
Real ID          IP Address                Current     Total    Highest Throughput   Total BW        CPS Server RTT        PPS
                                          Sessions   Sessions   Sessions     [Kbps]       [Mb]                 [ms]
-------          ----------                --------   --------   --------  ---------  ---------  ---------  ---------  ---------
WebServer1       Web Application Server           0          0          0                     0                  0.00          0
                  1
WebServer2       Web Application Server           0          0          0                     0                  0.00          0
                  2
-------          ----------                --------   --------   --------  ---------  ---------  ---------  ---------  ---------
                                                  0          0          0          0          0          0       0.00          0
Content Rule 40:
Action: group alteo
Real ID          IP Address                Current     Total    Highest Throughput   Total BW        CPS Server RTT        PPS
                                          Sessions   Sessions   Sessions     [Kbps]       [Mb]                 [ms]
-------          ----------                --------   --------   --------  ---------  ---------  ---------  ---------  ---------
WebServer1       Web Application Server           0          1          1                 0.012                  0.00          0
                  1
-------          ----------                --------   --------   --------  ---------  ---------  ---------  ---------  ---------
                                                  0          1          1          0      0.012          0       0.00          0
Content Rule 50:
Action: group altear
Real ID          IP Address                Current     Total    Highest Throughput   Total BW        CPS Server RTT        PPS
                                          Sessions   Sessions   Sessions     [Kbps]       [Mb]                 [ms]
-------          ----------                --------   --------   --------  ---------  ---------  ---------  ---------  ---------
WebServer2       Web Application Server           1          2          1                 0.026                  1.3           0
                  2
-------          ----------                --------   --------   --------  ---------  ---------  ---------  ---------  ---------
                                                  1          2          1          0      0.026          0        1.3          0
Service http summary statistics
--------------------------------
Current Sessions:       1
Total Sessions:         3
Highest Sessions:       2
Total Octets:           4836
Connections per second: 0
Packets per second:     0
Throughput per second:  0.000 Mbps
```

7. Export configuration as a backup. Name the file BACKUP CONTENT LOAD.

For questions, contact training@Radware.com