

Citrix NetScaler Load Balancer Configuration for Cisco Unified Intelligence Center (CUIC)

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Introduction

This document describes the configuration steps to use Citrix NetScaler load balancer for CUIC.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- CUIC
- Citrix Netscaler

Components Used

The information in this document is based on these software and hardware versions:

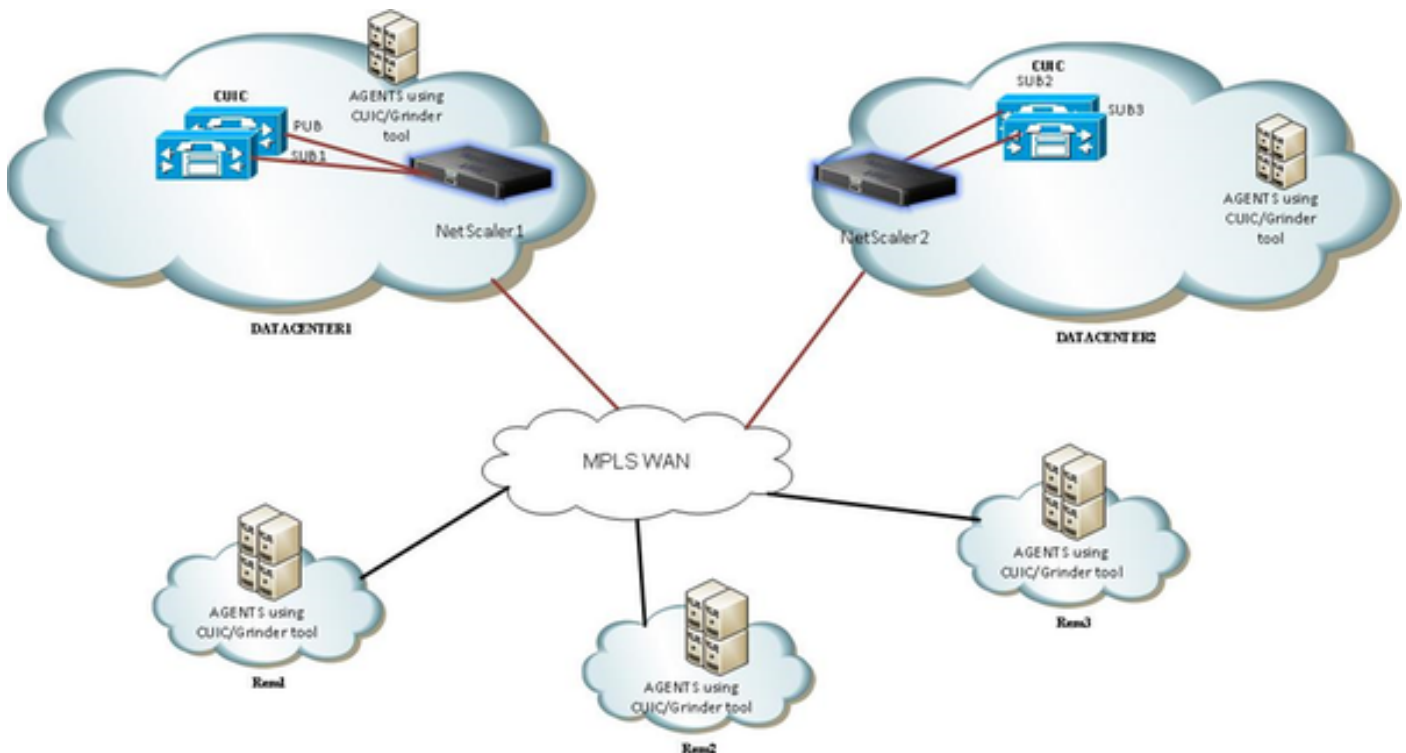
- CUIC 11.0(1)
- Citrix NS: appliance Edition: Citrix NetScaler 1000v (10.1 Build 125.8)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Background Information

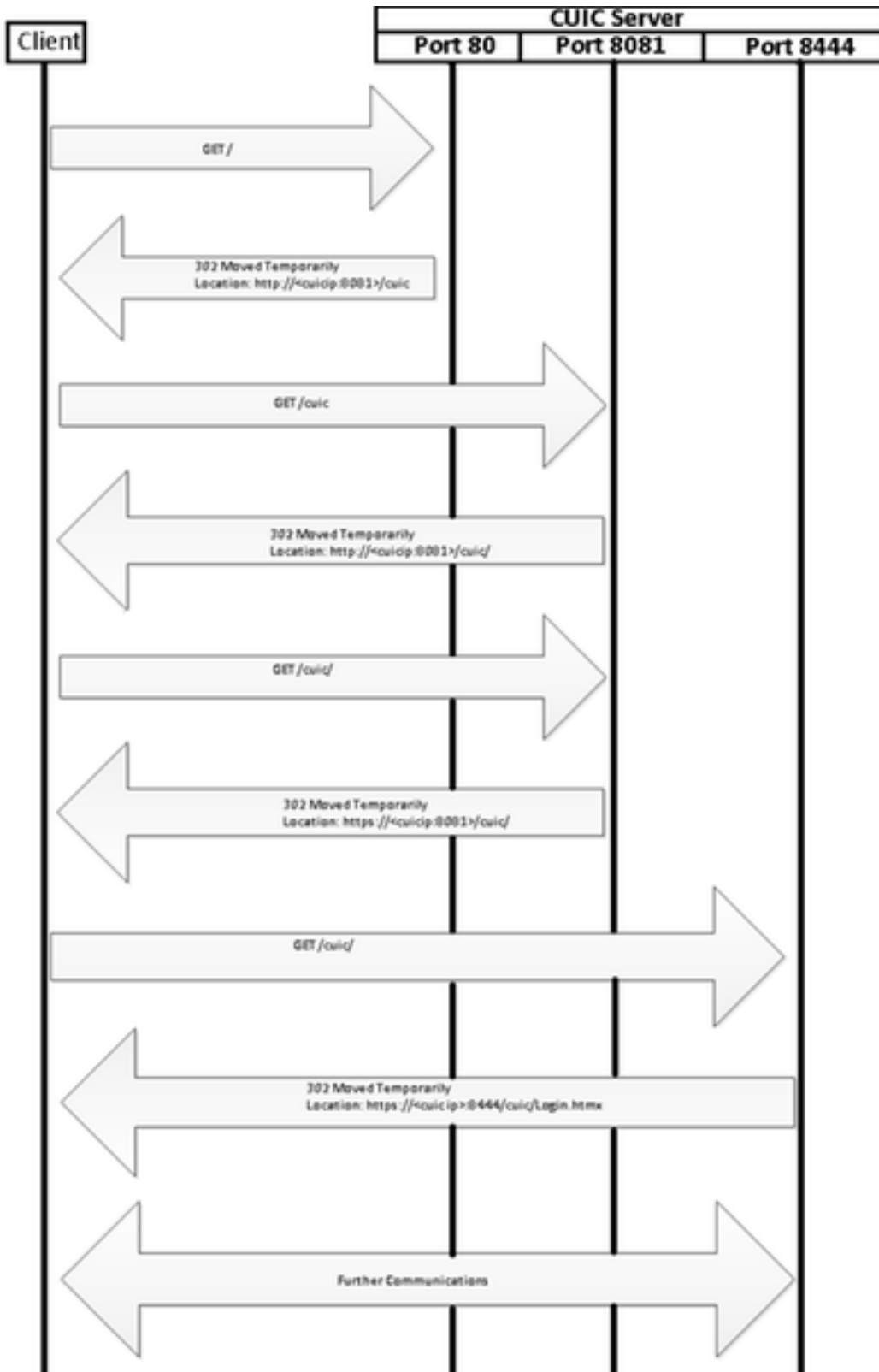
CUIC is a flexible and intuitive web-based reporting platform that provides you with reports on relevant business data. With CUIC, you can create a comprehensive information portal where contact center reports and dashboards are developed and shared throughout your organization. In large CUIC deployments, the Citrix NetScaler 1000v (Load Balancer) is used to load balance CUIC Hypertext Transfer Protocol (HTTP) and Hypertext Transfer Protocol Secure (HTTPS) traffic.

Network Diagram



Access Unified Intelligence Center Report with HTTP/HTTPS

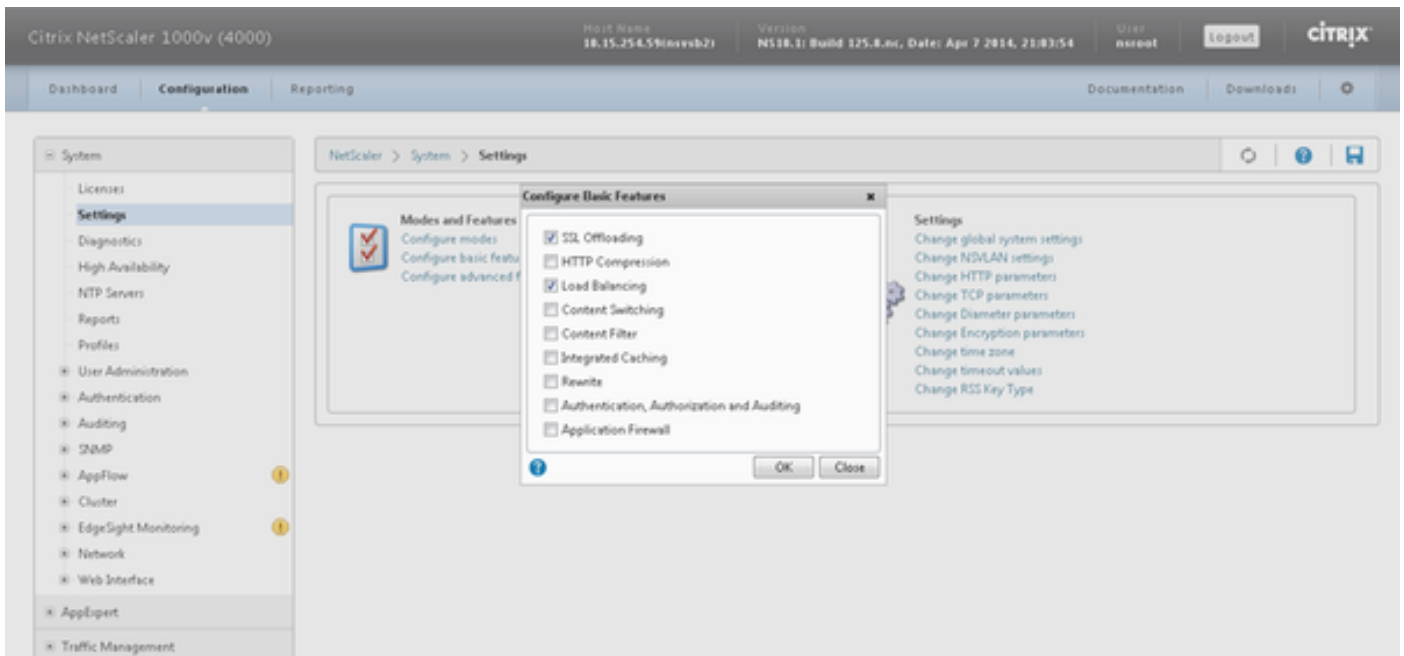
When HTTP is disabled in CUIC server, this is the HTTP flow to different ports.



Configuration

System Settings

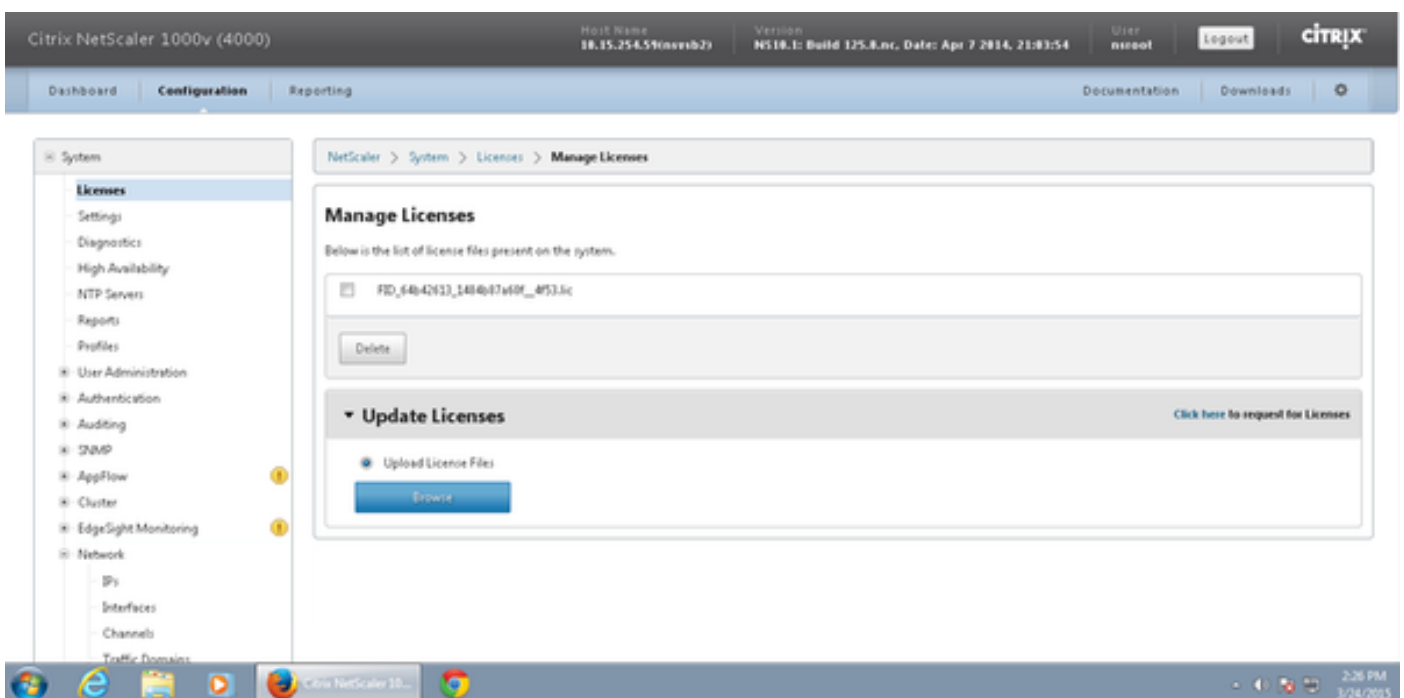
Configuration > Settings > Configure Basic Features



Upload License

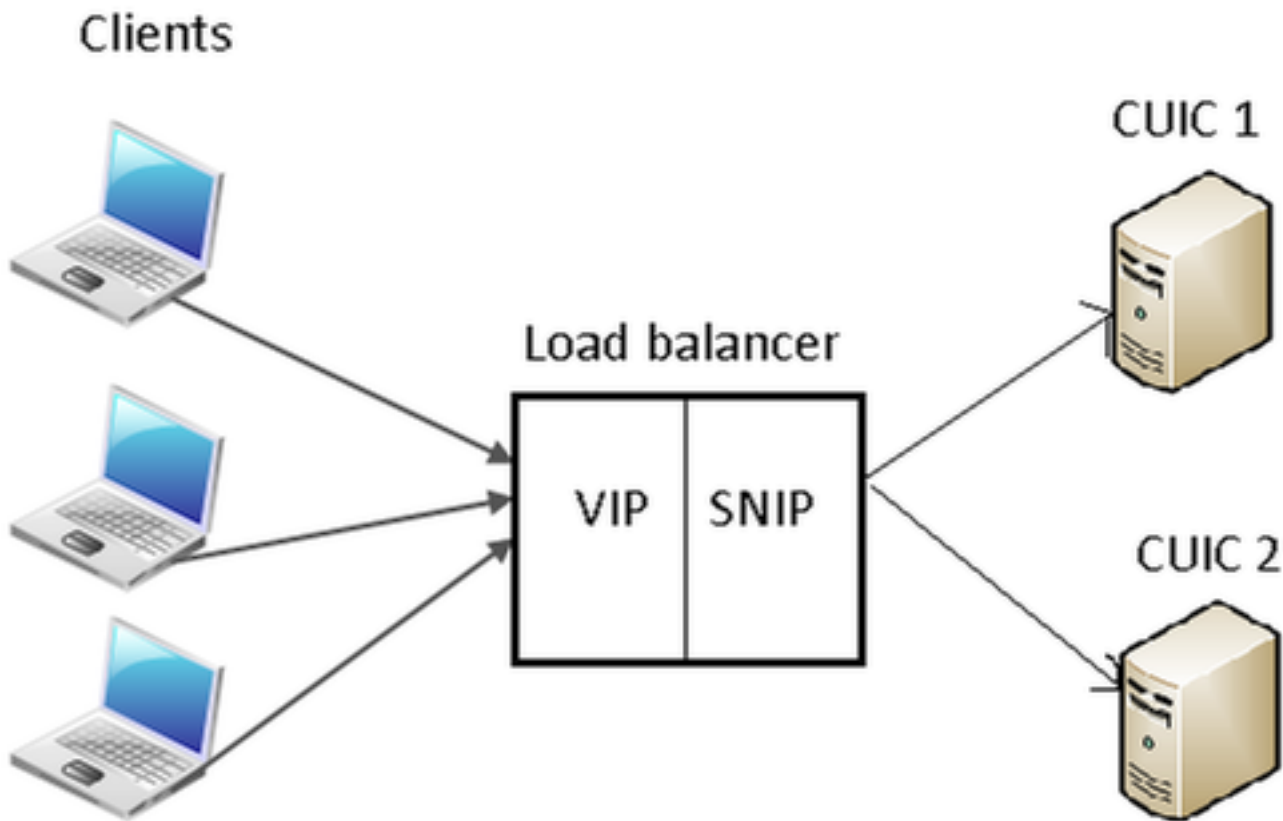
Without License SSL might not work.

Navigate to **System > Licenses > Manage Licenses > Update License**



Network Configuration

Clients talk to Load balancer through Virtual IP (VIP) and Load balancer talks to CUIC through its Subnet IP (SNIP).



Click **System > Network > IPs > IPv4s**

NetScaler > System > Network > IPs > IPv4s

IPv4s | IPv6s

Add... Open... Remove Action Search

IP Address	Traffic Domain ID	State	Type	Mode	ARP	ICMP	Virtual Server
10.15.254.59	0	Enabled	NetScaler IP	Active	ENABLED	ENABLED	-N/A-
10.10.2.58	0	Enabled	Subnet IP	Active	ENABLED	ENABLED	-N/A-
10.10.2.61	0	Enabled	Virtual IP	Active	ENABLED	ENABLED	ENABLED

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Create Subnet IP

- Step 1. Click on **Add** to add **IP Address**, select **Type** as **Subnet IP**.
- Step 2. Click **Create** to create desired IP address.

Configure IP

IP Address: 10 . 10 . 2 . 58 Netmask: 255 . 255 . 255 . 0

Type: Subnet IP Mode: Active

Virtual Router ID: ICMP Response*: NONE

ARP Response*: NONE Traffic Domain ID:

Options

ARP ICMP Virtual Server Dynamic Routing

Host Route

Enable

Gateway IP: Metric:

OSPF LSA Type

TYPE5 TYPE1 Area:

Vserver RHI Level

NONE ONE_VSERVER ALL_VSERVERS

Application Access Controls

Enable Management Access control to support the below listed applications.

? Create Close

Create VIP

Step 1. Click **Add** to add **IP Address**, select **Type** as **Virtual IP**.

Step 2. Click **Create** to create desired IP address.

Configure IP

IP Address: 10 . 10 . 2 . 61 Netmask: 255 . 255 . 255 . 255

Type: Virtual IP Mode: Active

Virtual Router ID: ICMP Response*: NONE

ARP Response*: NONE Traffic Domain ID:

Options

ARP ICMP Virtual Server Dynamic Routing

Host Route

Enable

Gateway IP: 0 . 0 . 0 . 0 Metric: 0

OSPF LSA Type

TYPE5 TYPE1 Area:

Vserver RHI Level

NONE ONE_VSERVER ALL_VSERVERS

Application Access Controls

Enable Management Access control to support the below listed applications.

? Create Close

Create Routes

If needed, create routes to the network from where HTTP/HTTPS requests come to Load Balancer.

Configure Route

Network: 10 . 3 . 4 . 0

Netmask: 255 . 255 . 255 . 0

Traffic Domain ID: [Dropdown]

NULL Route: Yes No

Gateway: 10 . 10 . 2 . 1

Distance: 1

Weight: 1

Cost: 0

Route Advertisement

Global State DISABLED

Over-ride Global

Protocol

OSPF RIP BGP ISIS

Monitored Static Route

Click **Create** to create desired route.

HTTPS Load Balancing Configuration

To create Virtual Server entries, one for each port in CUIC, three ports need to be monitored (HTTP ports 80, 8081 and HTTPS port 8444). Each virtual server entry is the IP and port combination which receives the HTTP traffic from client (accessing CUIC report).

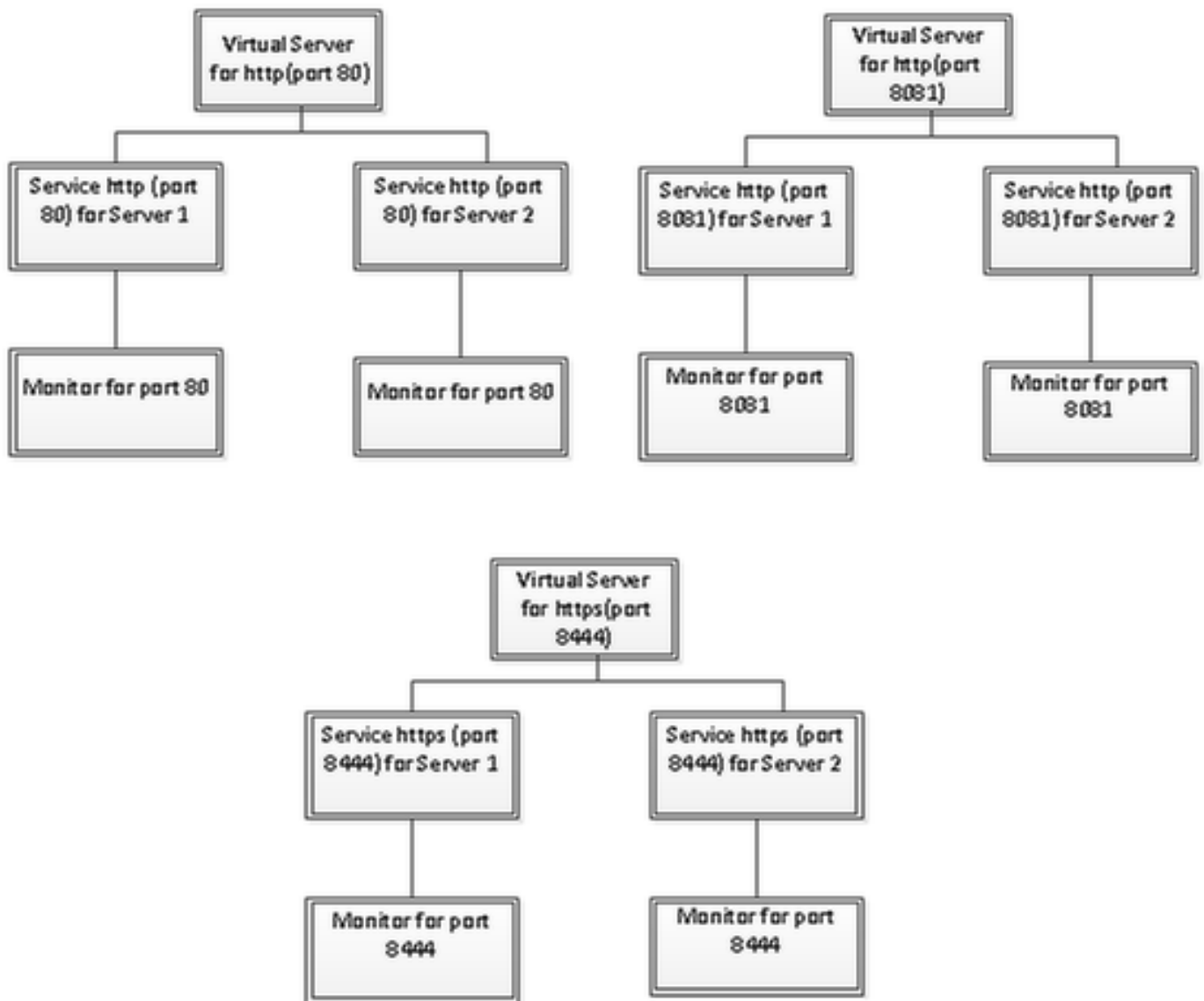
Virtual servers are required to be linked with servers, to send the load traffic them. To check the health status of the server's monitors, they need to be assigned to each server. Using the monitors, load detects the server (CUIC) failure and re-distributes the incoming traffic to servers which are in good health to serve the requests.

So the association is Virtual Server->Service and Server->Monitor.

Summary of Configurations:

- Create monitors
- Create Servers
- Create Services with Server association
- Link each service to corresponding monitors
- Create Virtual servers
- Link corresponding Services with Virtual Servers
- Create Persistency Group and add Virtual Servers

This image depicts three Virtual server entries and its association.



Create Monitors

Navigate to **Traffic Management > Load Balancing > Monitors**

NetScaler > Traffic Management > Load Balancing > Monitors

Name	State	Type
ping-default	Enabled	PING
tcp-default	Enabled	TCP
arp	Enabled	ARP
nd6	Enabled	ND6
ping	Enabled	PING
tcp	Enabled	TCP

To Create monitor, navigate to **Traffic Management > Load Balancing > Monitors**, click on **Add** button.

Three types of monitors are created, for port 80, 8081 and 8444.

Create monitor for http port 80

Select **Type** as **TCP** and specify **Interval**, **Response Time-out**, **Down Time**, **Retries** etc. accordingly.

Click **Create** to create the monitor. For HTTPS, two monitors needs to be created (one per server).

Create Monitor

Name* Type*

Standard Parameters | Special Parameters

Interval Destination IP IPv6

Response Time-out Destination Port

Down Time Dynamic Time-out

Deviation Dynamic Interval

Retries Resp Time-out Threshold

SNMP Alert Retries Action

Success Retries Custom Header

Failure Retries Treat back slash as escape character

Enabled Reverse

LRTM (Least Response Time using Monitoring) Transparent Secure IP Tunnel

TOS TOSId

Create Monitor [X]

Name* Type* HTTP [v]

Standard Parameters | Special Parameters

Interval Destination IP IPv6

Response Time-out Destination Port

Down Time Dynamic Time-out

Deviation Dynamic Interval

Retries Resp Time-out Threshold

SNMP Alert Retries Action

Success Retries Custom Header

Failure Retries Treat back slash as escape character

Enabled Reverse

LRTM (Least Response Time using Monitoring)

TOS TOSId Net Profile

Transparent Secure IP Tunnel

Help [Create] [Close]

For HTTPS type monitor, configure special parameter section. This monitor reports success if the response to the HTTP request is either 200 or 302.

When HTTP is disabled in CUIC, 302 is expected otherwise 200. To deal with both the situations 200 and 302 are included.

Configure Monitor

Name* Type HTTP

Standard Parameters | Special Parameters

HTTP Request

Treat back slash as escape character

Response Codes

Create Monitor

Name* Type* HTTP-ECV

Standard Parameters | Special Parameters

Interval Destination IP IPv6

Response Time-out Destination Port

Down Time Dynamic Time-out

Deviation Dynamic Interval

Retries Resp Time-out Threshold

SNMP Alert Retries Action

Success Retries Custom Header

Failure Retries Treat back slash as escape character

Enabled Reverse Net Profile

LRTM (Least Response Time using Monitoring) Transparent Secure IP Tunnel

TOS TOSId

For HTTPS type monitor, configure special parameter section. This monitor reports success only if the response contains a string **In Service**.

Configure Monitor [X]

Name* Type HTTP-ECV

Standard Parameters | **Special Parameters**

Send String

Treat back slash as escape character

Receive String

Treat back slash as escape character

Create Monitor



Name*

Type*

Standard Parameters

Special Parameters

Interval

Response Time-out

Down Time

Deviation

Retries

SNMP Alert Retries

Success Retries

Failure Retries

Enabled Reverse

LRTM (Least Response Time using Monitoring)

TOS TOSId

Destination IP IPv6

Destination Port

Dynamic Time-out

Dynamic Interval

Resp Time-out Threshold

Action

Custom Header

Net Profile

Transparent

Treat back slash as escape character

Secure IP Tunnel

Help

Create

Close

Create Monitor [X]

Name* Type* HTTP-ECV

Standard Parameters | Special Parameters

Send String

Treat back slash as escape character

Receive String

Treat back slash as escape character

Help [?] Create Close

Create Servers

Server represents a CUIC node. For each CUIC node served by the load balancer a server entry is required.

NetScaler > Traffic Management > Load Balancing > Servers

Name	State	IPAddress / Domain	Traffic Domain ID
ATL-CUIC-SUB4	Enabled	10.10.2.46	0
ATL-CUIC-SUB5	Enabled	10.10.2.47	0

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To create server, navigate to **Traffic Management > Load Balancing > Servers**, Click on **Add** button.

Create Server ✕

Server Name*

IP Address Domain Name

IPAddress* IPv6

Traffic Domain ID

Translation IP Address

Translation Mask

Resolve Retry (secs)

IPv6 Domain

Enable after Creating

Comments

? Create Close

Create Server ✕

Server Name*

IP Address Domain Name

IPAddress* IPv6

Traffic Domain ID

Translation IP Address

Translation Mask

Resolve Retry (secs)

IPv6 Domain

Enable after Creating

Comments

? Create Close

Create Services

To create monitor, navigate to **Traffic Management > Load Balancing > Services**, Click on **Add**.

NetScaler > Traffic Management > Load Balancing > Services

Buttons: Add... Open... Remove Action Search

Name	State	IP Address/Domain Name	Traffic Domain ID	Port	Protocol	Max Clients	Max Requests	Cache Type
cuic-http80-sub4	Up	10.10.2.46	0	80	HTTP	0	0	SERVER
cuic-http80-sub5	Up	10.10.2.47	0	80	HTTP	0	0	SERVER
cuic-http80801-sub4	Up	10.10.2.46	0	8081	HTTP	0	0	SERVER
cuic-http80801-sub5	Up	10.10.2.47	0	8081	HTTP	0	0	SERVER
cuic-https-sub4	Up	10.10.2.46	0	8444	SSL_BRIDGE	0	0	SERVER
cuic-https-sub5	Up	10.10.2.47	0	8444	SSL_BRIDGE	0	0	SERVER

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When there are no monitors associated, a default monitor might be displayed in configured box. Without removing that, select the correct monitor from available monitors from the available list (in this image it is **cust_tcp**) and click **Add** to move it to Configured list. Click **OK**. Next time when this page is opened, it shows only the selected monitor. Default monitor disappears. This happens because; always a service needs to be associated with a monitored. If nothing is configured, load balancer provides a default one, but when user selects a monitored then load balancer takes out the default monitor.

Configure Service

Service Name*: cuic-http80-sub4 Server*: ATL-CUIC-SUB4 (10.10.2.46)

Protocol*: HTTP Port*: 80

Traffic Domain: 0

Service State: UP Number of Active Clients:

Enable Health Monitoring AppFlow Logging

Monitors Policies Profiles Advanced SSL Settings

Available

Monitors
arp
nd6
ping
tcp
http
tcp-ecv
http-ecv
udp-ecv
dns
ftp

Configured

Monitors	Weight	State
cust_tcp	1	<input checked="" type="checkbox"/>

State: UP
 Probes: 68341 Failed [Total: 5614 Current: 0]
 Last Response: Success - TCP syn+ack received.
 Response Time: 0.357 millisc

Comments:

Configure Service

Service Name* Server*
Protocol* Port*
Traffic Domain

Service State UP Down
Number of Active Clients
 Enable Health Monitoring AppFlow Logging

- Monitors
- Policies
- Profiles
- Advanced
- SSL Settings

Thresholds

Max Requests	<input type="text" value="0"/>	Max Bandwidth (kbits)	<input type="text" value="0"/>
Max Clients	<input type="text" value="0"/>	Monitor Threshold	<input type="text" value="0"/>

Idle Time-out (secs)

Client Server

Settings

Use Source IP Client Keep-Alive TCP Buffering Compression

Client IP Header

Comments

Help

Configure Service

Service Name* Server*
Protocol* Port*
Traffic Domain

Service State UP Number of Active Clients
 Enable Health Monitoring AppFlow Logging

- Monitors
- Policies
- Profiles
- Advanced
- SSL Settings

Available

Monitors
arp
nd6
ping
tcp
http
tcp-ecv
http-ecv
udp-ecv
dns
ftp

Configured

Monitors	Weight	State
http_8081	1	<input checked="" type="checkbox"/>

State: UP
Probes: 68352 Failed [Total: 5630 Current: 0]
Last Response: Success - HTTP response code 302 received.
Response Time: 0.754 millisc

Comments

Help

Configure Service

Service Name* Server*
Protocol* Port*
Traffic Domain

Service State UP DOWN Number of Active Clients
 Enable Health Monitoring AppFlow Logging

Thresholds

Max Requests	<input type="text" value="0"/>	Max Bandwidth (kbits)	<input type="text" value="0"/>
Max Clients	<input type="text" value="0"/>	Monitor Threshold	<input type="text" value="0"/>

Idle Time-out (secs)

Client Server

Settings

Use Source IP Client Keep-Alive TCP Buffering Compression

Client IP Header

Comments

Configure Service



Service Name* Server*
Protocol* Port*
Traffic Domain

Service State UP DOWN Number of Active Clients

Enable Health Monitoring AppFlow Logging

Available

Monitors
arp
nd6
ping
tcp
http
tcp-ecv
http-ecv
udp-ecv
dns
ftp

Configured

Monitors	Weight	State
cust_sub4_https-ecv	1	<input checked="" type="checkbox"/>

State: UP
Probes: 384901 Failed [Total: 8624 Current: 0]
Last Response: Success - Pattern found in response.
Response Time: 1.463 millisec

Comments

Help

Configure Service

Service Name* Server*

 Protocol* Port*

 Traffic Domain

 Service State UP Number of Active Clients

 Enable Health Monitoring AppFlow Logging

Monitors Policies Profiles **Advanced** SSL Settings

Thresholds

Max Requests	<input type="text" value="0"/>	Max Bandwidth (kbits)	<input type="text" value="0"/>
Max Clients	<input type="text" value="0"/>	Monitor Threshold	<input type="text" value="0"/>

Idle Time-out (secs)

Client	<input type="text" value="180"/>	Server	<input type="text" value="360"/>
--------	----------------------------------	--------	----------------------------------

Settings

Use Source IP Client Keep-Alive TCP Buffering Compression

Client IP Header

Comments

Create Virtual Server

NetScaler > Traffic Management > Load Balancing > Virtual Servers

Name	State	Effective State	IP Address	Traffic Domain ID	Port	Protocol	Method	Persistence	% Health
DC2-CUIC-HTTP	<input checked="" type="radio"/> Up	<input checked="" type="radio"/> Up	10.10.2.61	0	80	HTTP	LEASTCONNECTION	SOURCEIP	100.00% 2 UP/0 DOWN
DC2-CUIC-HTTP8081	<input checked="" type="radio"/> Up	<input checked="" type="radio"/> Up	10.10.2.61	0	8081	HTTP	LEASTCONNECTION	SOURCEIP	100.00% 2 UP/0 DOWN
DC2-CUIC-HTTPS	<input checked="" type="radio"/> Up	<input checked="" type="radio"/> Up	10.10.2.61	0	8444	SSL_BRIDGE	LEASTCONNECTION	SOURCEIP	100.00% 2 UP/0 DOWN

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To create a virtual server, navigate to **Traffic Management > Load Balancing > Virtual Servers**, and click **Add**.

Check the services that needs to be associated with this virtual service.

In the **Method and Persistence** tab, select **Method** as **Least Connection**, **Persistence** as **SOURCEIP** and **Time-out** as **40** minutes. This is because the default historical reporting refresh rate is set to 30 minutes; you need to configure some value greater than the refresh rate. If you are configuring different refresh rate for historical report, then change this value as well.

Configure Virtual Server (Load Balancing)

Name* IP Address Based IP Pattern Based

Protocol* IP Address*

Network VServer Range Port*

Enable DNS64 Bypass AAAA Requests Traffic Domain ID

State UP AppFlow Logging

Services | Service Groups | Policies | Method and Persistence | **Advanced** | Profiles | SSL Settings

LB Method

Method New Service Startup Request Rate

Increment Interval

Current Method: Round Robin
Reason: Bound service's state changed to UP

Persistence

Persistence Backup Persistence Persistence

Time-out (min) Time-out (min)

IPv4 Netmask IPv6 Mask Length

Configure Virtual Server (Load Balancing)

Name* IP Address Based IP Pattern Based

Protocol* IP Address*

Network VServer Range Port*

Enable DNS64 Bypass AAAA Requests Traffic Domain ID

State UP AppFlow Logging

Services | Service Groups | Policies | Method and Persistence | **Advanced** | Profiles | SSL Settings

[Activate All](#) [Deactivate All](#)

Active	Service Name	IP Address	Port	Protocol	State	Weight	Dynamic Weight
<input checked="" type="checkbox"/>	cuic-http80801-sub4	10.10.2.46	8081	HTTP	<input checked="" type="radio"/> UP	<input type="text" value="1"/>	0
<input checked="" type="checkbox"/>	cuic-http80801-sub5	10.10.2.47	8081	HTTP	<input checked="" type="radio"/> UP	<input type="text" value="1"/>	0
<input type="checkbox"/>	cuic-http80-sub4	10.10.2.46	80	HTTP	<input checked="" type="radio"/> UP	<input type="text" value="1"/>	
<input type="checkbox"/>	cuic-http80-sub5	10.10.2.47	80	HTTP	<input checked="" type="radio"/> UP	<input type="text" value="1"/>	

Comments

Configure Virtual Server (Load Balancing)

Name* IP Address Based IP Pattern Based

Protocol* IP Address*

Network VServer Range Port*

Enable DNS64 Bypass AAAA Requests Traffic Domain ID

State UP AppFlow Logging

Services | Service Groups | Policies | Method and Persistence | Advanced | Profiles | SSL Settings

[Activate All](#) [Deactivate All](#)

Active	Service Name	IP Address	Port	Protocol	State	Weight	Dynamic Weight
<input checked="" type="checkbox"/>	cuic-https-sub4	10.10.2.46	8444	SSL_BRIDGE	<input checked="" type="radio"/> UP	<input type="text" value="1"/>	0
<input checked="" type="checkbox"/>	cuic-https-sub5	10.10.2.47	8444	SSL_BRIDGE	<input checked="" type="radio"/> UP	<input type="text" value="1"/>	0

Comments

Create Persistency Groups

To create Persistency group, navigate to **Traffic Management > Load Balancing > Persistency Groups**, click **Add**.

Select **Method** as **Least Connection**, **Persistence** as **SOURCEIP** and **Time-out** as **40** minutes. This is because the default historical reporting refresh rate is set to 30 minutes; you need to configure some value greater than the refresh rate. If you are configuring different refresh rate for historical report, then change this value as well.

Since each CUIC server listens on three ports, you need to include all three virtual servers here. If a client requests to HTTP 80 port which is already sent to a particular CUIC server, all requests from that client targeting to port 8081, 8444 is routed to the same CUIC.

Configure Persistency Group

Group Name: PgroupDC2

Persistence*: SOURCEIP

IPv4 Netmask: 255 . 255 . 255 . 255

IPv6 Mask Length: 128

Time-out: 40

Backup Persistence*: NONE

Virtual Server Name*

Configured (3) Remove All

DC2-CUIC-HTTP	-
DC2-CUIC-HTTP8081	-
DC2-CUIC-HTTPS	-

+ Add

? OK Close

Reference

1. <http://support.citrix.com/proddocs/topic/netscaler/ns-gen-netscaler-wrapper-con.html>