

Alteon Application Delivery Controller (ADC)
Optimizing the Delivery of Microsoft Lync 2013

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Introduction

In today's competitive business landscape, the "always up" requirement from a unified communication service such as Microsoft Lync Server 2013 has a strong business justification. A planned conference call with a customer that was canceled due to communication issues or an important executive-level update that was delayed or prevented due to a failed communication service are just two examples of its high business impact.

Additionally, the need to efficiently scale-up the unified communication solution to support additional services, increased capacity, and more concurrent users is a challenge that all IT organizations must address when planning and deploying a Microsoft Lync solution.

Radware's Alteon Application Delivery Controller (ADC) guarantees Lync Server maximum availability, scalability and performance. Managing traffic for both the Web Service content and SIP-based unified communication services, Alteon ADC provides advanced health monitoring to avoid system down time, and advanced traffic management to deliver a best-of-breed subsystem. With a "Pay-as-you-Grow" platform licensing model, Alteon ADC ensures long term investment protection, facilitating incremental growth demanded by today's businesses.

Using Microsoft Lync Server 2013 and Radware ADC solutions, customers can receive the following key business benefits:

- A complete highly available and highly-performing unified communication solution by leveraging Radware ADC solution capabilities such as server health monitoring and smart load balancing.
- Seamless multi-site load balancing through Radware's patented global server load balancing functionality, enabling transparent disaster recovery failover and active-active site backup.
- The combined Radware-Microsoft solution can support a larger number of users with smaller and more cost-effective infrastructure by offloading resource intensive server tasks to the Radware ADC, such as SSL termination, resulting in support of more users per server.
- By using Radware ADC with its content caching and compression features in conjunction with the Microsoft Lync Server 2013, end-users connected over slow speed WAN connections (such as cellular networks), can benefit from faster response time and a noticeably improved Quality of Experience (QoE)
- Seamless scalability. Radware's "Pay-as-you-Grow" approach enables adding more capacity to the solution with no service interruption or system reconfiguration via Radware's On-Demand Switch platforms
- A [Microsoft certified solution](#), fully tested and validated.

Microsoft Lync 2013 Overview

Microsoft Lync is an enterprise-ready unified communications platform. Lync connects people everywhere (on Windows 8 and other operating systems including mobile devices) as part of their everyday productivity experience. Lync provides a consistent, single client experience for presence, instant messaging, voice, video and a great meeting experience. Lync users can connect to anyone on Skype, enabling rich communication with hundreds of millions of people around the world.

How it works

Work Anywhere – Lync allows users to communicate securely and stay connected with colleagues and customers from virtually wherever they chose to work.

Lync Across Devices

Users can switch between devices as they choose based on their needs. Lync offers a familiar and consistent user experience across PCs, phones, browsers, and tablets.

Connected Experiences

Lync connects together millions of people, their communications, and the applications they use every day. Multi-party HD video conferencing brings life and expression to Lync Meetings.

Simpler to Manage

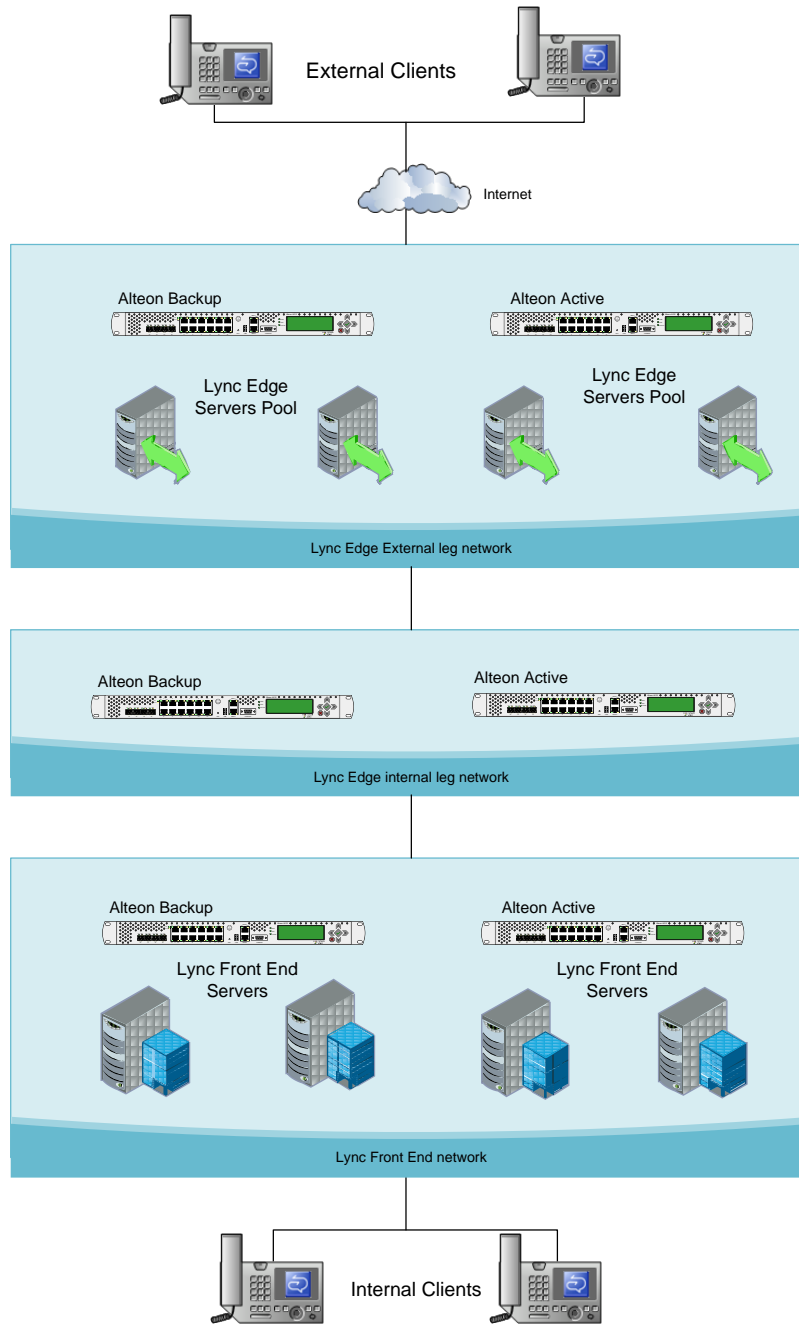
Lync is a dependable platform for all real-time communications. A single system reduces complexity in Enterprise IT.

Deployment Flexibility –Lync lets you reach your vision of unified communications – on your timeline following your blueprint.

Joint Solution Topology Example

Radware's ADC solution provides high availability and improved performance to the Microsoft Lync 2013 unified communication solution through smart traffic load balancing and redirection. The simplest implementation is done by configuring a virtual IP address on the Alteon ADC to which all Lync traffic goes through, and intelligently distributed to the pool of Lync servers.

The following topology diagram is a generic logical example, demonstrating which Lync server elements can be load balanced by the Alteon ADCs, such as Lync Edge servers and Lync Front End Servers.



A more realistic topology would use a single ADC device (or a cluster of two for redundancy), to provide all ADC services to the various Lync server pools and zones in the network, separating the traffic through VLANs and by using a different virtual IP per VLAN – representing a network zone (such as a DMZ or LAN), and per server pool.

Lync Server Protocols Load Balanced by Radware ADC

This section describes Lync Server protocols that can be load balanced by Radware ADC, including:

- [Protocols for Front End Servers](#)
- [Protocols for Edge Server External Leg](#)
- [Protocols for Edge Server Internal Leg](#)

For more information on these protocols, go to <http://technet.microsoft.com/en-us/library/gg398833.aspx>.

Protocols for Front End Servers

Service	Port	Protocol	Notes
Lync Server Front-End service	5060	TCP	Optionally used by Standard Edition servers and Front End Servers for static routes to trusted services, such as remote call control servers.
Front-End service	5061	TCP (TLS)	Used by Standard Edition servers and Front End pools for all internal SIP communications between servers (MTLS), for SIP communications between Server and Client (TLS) and for SIP communications between Front End Servers and Mediation Servers (MTLS). Also used for communications with Monitoring Server.
Front-End service	444	HTTPS	Used for HTTPS communication between the Focus (the Lync Server component that manages conference state) and the individual servers.
		TCP	This port is also used for TCP communication between Front End Servers and Survivable Branch Appliances.
Lync Server Front-End service	135	DCOM and remote procedure call (RPC)	Used for DCOM-based operations such as Moving Users, User Replicator Synchronization, and Address Book Synchronization.
Lync Server IM Conferencing service	5062	TCP	Used for incoming SIP requests for instant messaging (IM) conferencing.
Lync Server Web	8057	TCP (TLS)	Used to listen for Persistent Shared

Service	Port	Protocol	Notes
Conferencing service			Object Model (PSOM) connections from client.
Lync Server Audio/Video Conferencing service	5063	TCP	Used for incoming SIP requests for audio/video (A/V) conferencing.
Lync Server Web Compatibility service	443	HTTPS	Used for communication from Front End Servers to the web farm FQDNs (the URLs used by IIS web components).
Lync Server Application Sharing service	5065	TCP	Used for incoming SIP listening requests for application sharing.
Lync Server Conferencing Announcement service	5073	TCP	Used for incoming SIP requests for the Lync Server Conferencing Announcement service (that is, for dial-in conferencing).
Lync Server Call Park service	5075	TCP	Used for incoming SIP requests for the Call Park application.
Audio Test service	5076	TCP	Used for incoming SIP requests for the Audio Test service.
Lync Server Response Group service	5071	TCP	Used for incoming SIP requests for the Response Group application.
Lync Server Bandwidth Policy Service	5080	TCP	Used for call admission control by the Bandwidth Policy service for A/V Edge TURN traffic.
Lync Server Bandwidth Policy Service	448	TCP	Used for call admission control by the Lync Server Bandwidth Policy Service.
Lync Server Web Services	8080	TCP	Front End web services

Protocols for Edge Server External Leg

Service	Port	Protocol	Notes
Load balancer for Edge Servers	443	TCP	Used for SIP Access Service (VIP1).
Load balancer for Edge Servers	5061	TCP	Used for Federation mode.
Load balancer for Edge Servers	443	TCP	Used for Web Conferencing service (VIP2).
Load balancer for Edge Servers	443	TCP	Used for A/V service (VIP3).
Load balancer for	3478	UDP	STUN/UDP for A/V service.

Service	Port	Protocol	Notes
Edge Servers			

Protocols for Edge Server Internal Leg

Service	Port	Protocol	Notes
Load balancer for Edge Servers	443	TCP	Used for Web Service
Load balancer for Edge Servers	5061	TCP	SIP TLS
Load balancer for Edge Servers	5062	TCP	Internal Edge authentication
Load balancer for Edge Servers	3478	UDP	STUN/UDP for A/V service

Radware Alteon ADC

Radware Alteon ADC provides breakthrough performance, advanced application acceleration capabilities, and on-demand scalability needed to effectively meet contemporary network and business needs. Specifically designed for the majority of enterprises and carriers that operate in dynamic, ever-changing environments and face diverse requirements, the Alteon ADC provides the extendable throughput they need from 0 to 80Gbps for unparalleled scalability, business availability, and performance.

Integrated Application Acceleration Capabilities

Alteon ADC deliver a wide set of application acceleration capabilities including SSL offloading, web compression, caching, HTTP multiplexing, and TCP optimization. These capabilities are designed to offload servers, address server performance issues, enhance response-time for best QoE and mitigate security risks. By offloading processor intensive operations from servers, Alteon frees the servers' CPUs to handle additional requests, eliminating the need to buy additional hardware to support application processing requirements and reducing CAPEX and OPEX.

The Alteon ADC is validated and certified by leading application vendors such as Microsoft, Oracle, SAP, IBM, and others. When operating Alteon ADC with Microsoft SharePoint, for example, the response time of SharePoint servers is accelerated by 350% and the servers' CPU load is reduced by 40%. Similar benefits are achieved with other popular applications.

Application acceleration capabilities have greater importance in virtual data centers where applications suffer from increased latency caused by the virtualization infrastructure. Alteon reduces applications latency and improves QoE of virtual applications.

Intelligently Embedding Radware's 'On Demand' Infrastructure Approach

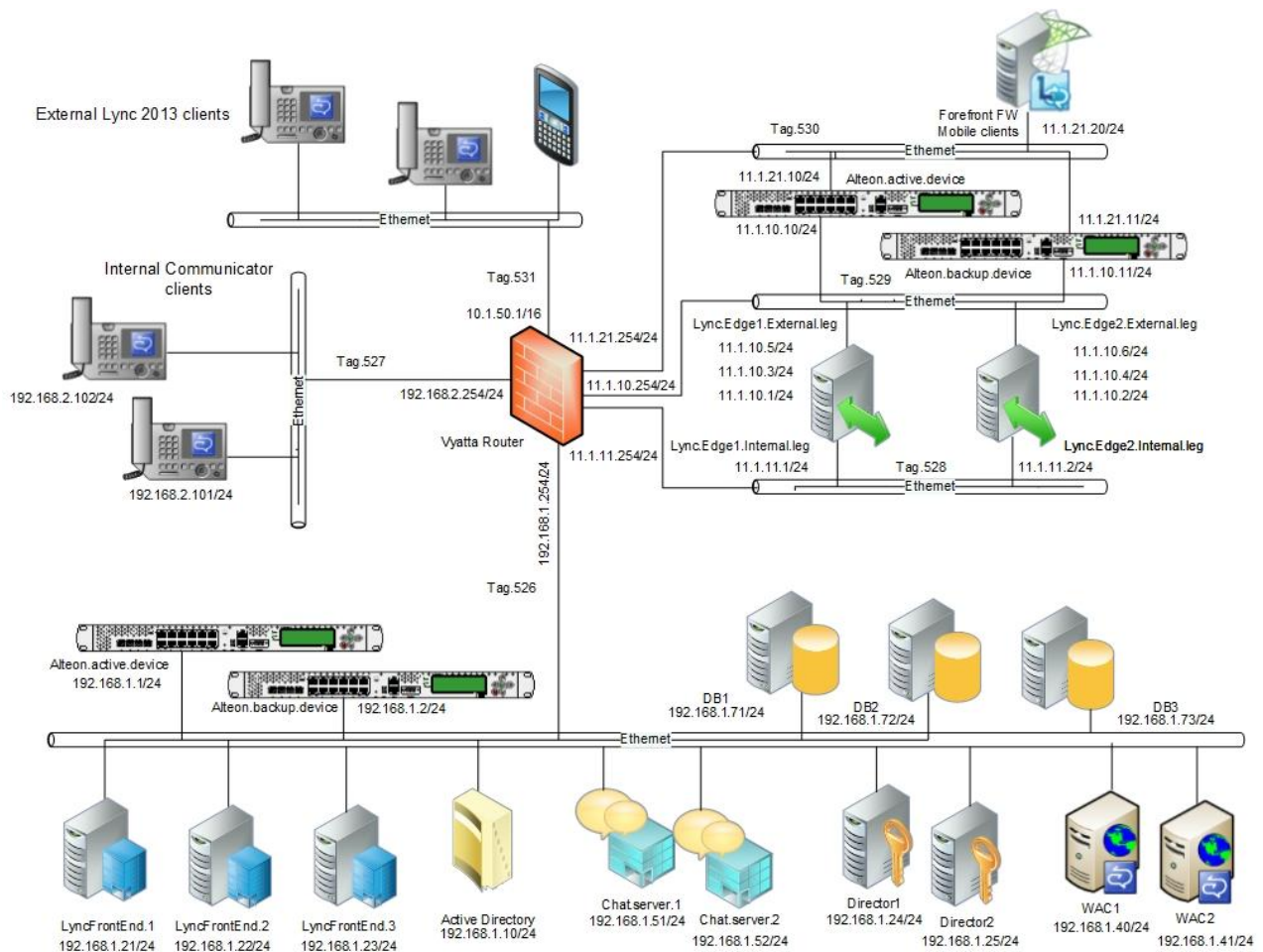
By embracing Radware's "Pay-as-you-Grow" approach, you only pay for the exact capacity currently required and prevent over-spending on the initial solution. Throughput capacity,

acceleration capabilities and application-aware services can be added on-demand to meet new business requirements – with no forklift upgrade of the platform and without even restarting it.

The “Pay-as-you-Grow” approach lets you overcome capacity planning challenges and reduces the risk associated with data center growth for best investment protection. Thanks to platform standardization and simplicity, there are two platforms to cover all of your application needs resulting in fewer spare parts, and less training and operations, dramatically reducing OPEX.

Radware Alteon ADC and Microsoft Lync Architecture

The following is an illustration of the tested network described in this document.



Important Implementation Notes

1. There are two pairs of Alteon ADC configured for this deployment: a pair of Alteons configured in the DMZ for the Edge Servers and a pair of Alteons configured in the LAN for the Front-End Servers.
2. DNS SRV records for the appropriate domain are used to locate the Lync servers for client connectivity. DNS administration is required to bind an A

record for the Lync FQDN, where the FQDN resolves to the appropriate Alteon Virtual IP Address (VIP). Alteon can become the Authoritative responder for this FQDN, normally used in Disaster Recovery designs. In this case, the DNS would use a name server record pointing to the Alteon platform for the authoritative response. Alteon would base the response on the availability, load, and proximity information it uses to drive intelligent load distribution.

3. Internal legs of the Edge servers routing table for 192.168.1.0/24, 192.168.2.0/24, and 192.168.3.0/24 must be routed statically on the servers to IP 11.1.11.254.

Windows command example:

```
route add 192.168.1.0 mask 255.255.255.0 11.1.11.254 -p
```

4. Microsoft requires a session timeout of 1800 second. Ensure that the aging time on the Alteon platform is set to 30 minutes.
5. Import the Microsoft Lync certificate to the Internal Alteon platforms. For procedures on understand how to import the Certificate. refer to the *Alteon Application Switch Operating System Application Guide* and the *Alteon Application Switch Operating System Command Reference*.
6. To sync the configuration after configuring the active Alteon, run the command `/oper/slb/sync` to copy the configuration.
Note: You must configure Layer 2 and Layer 3 network configurations on the Alteon standby device before applying the **sync** command.
7. An insert cookie called "WS-WSMAN" is required for port 4443. For more information, refer to <http://technet.microsoft.com/en-us/library/jj656815.aspx>.

Software and Hardware

The following is a list of hardware and software tested to verify the interoperability of the presented solution:

- Microsoft Windows 2012 Enterprise x64bits
- Radware Alteon version 29.0 (4 units)
- Microsoft Lync 2013 Enterprise
- Microsoft SQL Server 2012

Configuration

This section includes the configuration for implementing this solution, including:

- [Alteon Internal Active Configuration](#)
- [Alteon Internal Standby Configuration](#)
- [Alteon External Active Configuration](#)
- [Alteon External Standby Configuration](#)

Alteon Internal Active Configuration

Network Configuration

```
/c/port 1
  pvid 526
/c/l2/vlan 1
  learn ena
  def 0
/c/l2/vlan 526
  ena
  name "526"
  learn ena
  def 1
/c/l2/vlan 526/ip6nd
  rltime 180
  opinfo disabled
  apinfo disabled
/c/l2/stg 1/clear
/c/l2/stg 1/add 1 2 526
/c/sys/sshd/ena
/c/sys/sshd/on
/c/l3/if 1
  ena
  ipver v4
  addr 192.168.1.2
  vlan 526
/c/l3/gw 1
  ena
  ipver v4
  addr 192.168.1.254
```

Sync Configuration

```
/c/slb/sync
  prios d
  certs e
  state e
```

```
/c/slb/sync/peer 1
  ena
  addr 192.168.1.3
```

Real Servers Configuration

```
/c/slb/real 1
  ena
  ipver v4
  rip 192.168.1.21
  name "FrontEnd.1"
```

```
/c/slb/real 2
  ena
  ipver v4
  rip 192.168.1.22
  name "FrontEnd.2"
```

```
/c/slb/real 3
  ena
  ipver v4
  rip 192.168.1.23
  name "FrontEnd.3"
```

```
/c/slb/real 4
  ena
  ipver v4
  rip 192.168.1.40
  name "WAC.1"
```

```
/c/slb/real 5
  ena
  ipver v4
  rip 192.168.1.41
  name "WAC.2"
```

```
/c/slb/real 6
  ena
  ipver v4
  rip 192.168.1.24
  name "Director.1"
```

```
/c/slb/real 7
```

```
ena
ipver v4
rip 192.168.1.25
name "Director.2"
/c/slb/real 8
ena
ipver v4
rip 11.1.11.1
name "Edge.internal.1"
/c/slb/real 9
ena
ipver v4
rip 11.1.11.2
name "Edge.internal.2"
```

Server Groups Configuration

```
/c/slb/group 2
ipver v4
health hc1
add 1
add 2
add 3
name "Lync.Frontend.HTTPS.conf.444"
/c/slb/group 3
ipver v4
health hc1
add 1
add 2
add 3
name "Lync.Frontend.HTTPS.443"
/c/slb/group 4
ipver v4
health hc1
add 1
add 2
add 3
```

```
name "Lync.Frontend.MTLS.5061"  
/c/slb/group 5  
ipver v4  
health hc1  
add 1  
add 2  
add 3  
name "Lync.Frontend.DCOM.135"  
/c/slb/group 7  
ipver v4  
health hc1  
add 1  
add 2  
add 3  
name "Proxy.to.FE.4443"  
/c/slb/group 9  
ipver v4  
health hc1  
add 1  
add 2  
add 3  
name "FE.web.service.8080 "  
/c/slb/group 10  
ipver v4  
health hc1  
add 1  
add 2  
add 3  
name "FE.CALL.ADM.448"  
/c/slb/group 11  
ipver v4  
health hc1  
add 1  
add 2  
add 3  
name "FE.App.Share.5065"
```

```
/c/slb/group 12
  ipver v4
  health hc1
  add 1
  add 2
  add 3
  name "FE.RES.GROUP.5071"
/c/slb/group 13
  ipver v4
  health hc1
  add 1
  add 2
  add 3
  name "FE.SIP.REQ.5072"
/c/slb/group 14
  ipver v4
  health hc1
  add 1
  add 2
  add 3
  name "FE.CONF.ANOUN.5073"
/c/slb/group 15
  ipver v4
  health hc1
  add 1
  add 2
  add 3
  name "FE.AUDIO.TEST.5076"
/c/slb/group 16
  ipver v4
  health hc1
  add 1
  add 2
  add 3
  name "FE.AV.AGE.TURN.TRAFF.5080"
/c/slb/group 17
```



```
ipver v4
health hc1
add 1
add 2
add 3
name "FE.SIP.request.5075"
/c/slb/group 18
ipver v4
health hc1
add 1
add 2
add 3
name "FE.Mediation.5070"
/c/slb/group 19
ipver v4
health hc1
add 1
add 2
add 3
name "FE.web.service.80"
/c/slb/group 20
ipver v4
health hc1
add 6
add 7
name "Lync.Director.443"
/c/slb/group 21
ipver v4
health hc1
add 6
add 7
name "Lync.Director.444"
/c/slb/group 22
ipver v4
health hc1
add 6
```

```
add 7
name "Lync.Director.5061"
/c/slb/group 23
ipver v4
health hc1
add 6
add 7
name "Lync.Director.4443"
/c/slb/group 24
ipver v4
health hc1
add 4
add 5
name "WAC.443"
/c/slb/group 26
ipver v4
health hc1
add 8
add 9
name "EDGE.INT.443"
/c/slb/group 27
ipver v4
health hc1
add 8
add 9
name "EDGE.INT.5061"
/c/slb/group 28
ipver v4
health hc1
add 8
add 9
name "EDGE.INT.5062"
/c/slb/group 29
ipver v4
health hc1
add 8
```

```
add 9
name "EDGE.INT.UDP.STUN.3478"
```

Alteon Process Directions

```
/c/slb/port 1
client ena
server ena
proxy ena
```

Virtual Servers and Services Configuration

```
/c/slb/virt 1
ena
ipver v4
vip 192.168.1.200
vname "Lync.Frontend.DCOM.135"
/c/slb/virt 1/service 135 basic-slb
group 5
rport 135
/c/slb/virt 2
ena
ipver v4
vip 192.168.1.200
vname "Lync.Frontend.HTTPS.443"
/c/slb/virt 2/service 443 https
group 3
rport 0
dbind ena
tmout 30
ptmout 30
/c/slb/virt 3
ena
ipver v4
vip 192.168.1.200
vname "Lync.Frontend.HTTPS.conf.444"
/c/slb/virt 3/service 444 basic-slb
group 2
```

```
rport 444
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 5
ena
ipver v4
vip 192.168.1.200
vname "Lync.Frontend.MTLS.5061"
/c/slb/virt 5/service 5061 basic-slb
group 4
rport 5061
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 6
ena
ipver v4
vip 192.168.1.200
vname "Lync.FE.SIP.app.sharing.5065"
/c/slb/virt 6/service 5065 basic-slb
group 11
rport 5065
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 7
ena
ipver v4
vip 192.168.1.200
vname "Lync.proxy.4443"
/c/slb/virt 7/service 4443 https
group 7
rport 4443
dbind ena
tmout 30
```

```
ptmout 30
/c/slb/virt 7/service 4443 https/http
  compol 1
/c/slb/virt 7/service 4443 https/ssl
  srvrcert cert eyal
  sslpol 1
/c/slb/virt 8
  ena
  ipver v4
  vip 192.168.1.200
  vname "Lync.call.admission.control .448"
/c/slb/virt 8/service 448 basic-slb
  group 10
  rport 448
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/virt 9
  ena
  ipver v4
  vip 192.168.1.200
  vname "Lync.Responese.group.5071"
/c/slb/virt 9/service 5071 basic-slb
  group 12
  rport 5071
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/virt 10
  ena
  ipver v4
  vip 192.168.1.200
  vname "Lync.SIP.Request.5072"
/c/slb/virt 10/service 5072 basic-slb
  group 13
  rport 5072
```

```
pbind clientip norport
/c/slb/virt 11
ena
ipver v4
vip 192.168.1.200
vname "Lync.Conferencing.anoun.5073"
/c/slb/virt 11/service 5073 basic-slb
group 14
rport 5073
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 12
ena
ipver v4
vip 192.168.1.200
vname "Lync.SIP.Request.call.park.5075"
/c/slb/virt 12/service 5075 basic-slb
group 17
rport 5075
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 13
ena
ipver v4
vip 192.168.1.200
vname "Lync.Audio.test.service.5076"
/c/slb/virt 13/service 5076 basic-slb
group 15
rport 5076
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 14
ena
```

```
ipver v4
vip 192.168.1.200
vname "Lync.AV.age.turn.traffic.5080"
/c/slb/virt 14/service 5080 basic-slb
group 16
rport 5080
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 15
ena
ipver v4
vip 192.168.1.200
vname "Lync.External.Web.services.8080"
/c/slb/virt 15/service 8080 basic-slb
group 9
rport 8080
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 16
ena
ipver v4
vip 192.168.1.200
vname "Lync.External.Web.services.80"
/c/slb/virt 16/service 80 http
group 19
rport 80
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 17
ena
ipver v4
vip 192.168.1.160
vname "Lync.Directors"
```

```
/c/slb/virt 17/service 443 https
  group 20
  rport 443
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/virt 17/service 4443 basic-slb
  group 23
  rport 4443
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/virt 17/service 444 basic-slb
  group 21
  rport 444
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/virt 17/service 5061 basic-slb
  group 22
  rport 5061
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/virt 18
  ena
  ipver v4
  vip 192.168.1.170
  vname "WAC.443.service"
/c/slb/virt 18/service 443 https
  group 24
  rport 443
  dbind ena
  tmout 30
  ptmout 30
/c/slb/virt 19
```



```
ena
ipver v4
vip 192.168.1.230
vname "Lync.edge.internal.UDP.STUN.3478"
/c/slb/virt 19/service 3478 basic-slb
group 29
rport 3478
protocol udp
pbind clientip norport
/c/slb/virt 20
ena
ipver v4
vip 192.168.1.230
vname "Lync.Edge.internal.443"
/c/slb/virt 20/service 443 https
group 26
rport 443
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 21
ena
ipver v4
vip 192.168.1.230
vname "Lync.Edge.internal.5062"
/c/slb/virt 21/service 5061 basic-slb
group 27
rport 5061
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 22
ena
ipver v4
vip 192.168.1.230
vname "Lync.Edge.Internal.5062"
```

```
/c/slb/virt 22/service 5062 basic-slb
  group 28
  rport 5062
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/real 1/layer7
  addlb 1
/c/slb/real 3/layer7
  addlb 1
/c/slb/real 4/layer7
  addlb 1
/c/slb/real 5/layer7
  addlb 1
/c/slb/real 6/layer7
  addlb 1
/c/slb/real 8/layer7
  addlb 1
/c/slb/real 9/layer7
  addlb 1
/c/slb/virt 2/service 443 https/pbind sslid
/c/slb/virt 7/service 4443 https/pbind cookie insert "MS-WSMAN" 3650:0:0
/c/slb/virt 7/service 4443 https/http/rcount 1
/c/slb/virt 18/service 443 https/pbind sslid
```

VRRP Configuration

```
/c/l3/vrrp/on
/c/l3/vrrp/vr 1
  ena
  ipver v4
  vrid 1
  if 1
  prio 254
  addr 192.168.1.1
/c/l3/vrrp/vr 2
  ena
```

```
ipver v4
vrid 2
if 1
prio 254
addr 192.168.1.200
/c/l3/vrrp/vr 3
ena
ipver v4
vrid 3
if 1
prio 254
addr 192.168.1.230
/c/l3/vrrp/vr 4
ena
ipver v4
vrid 4
if 1
prio 254
addr 192.168.1.170
/c/l3/vrrp/vr 5
ena
ipver v4
vrid 5
if 1
prio 254
addr 192.168.1.160
```

PIP Configuration

```
/c/slb/pip/type vlan
/c/slb/pip/type port
/c/slb/pip/add 192.168.1.99 1
```

Compression Configuration

```
/c/slb/accel/compress
on
/c/slb/accel/compress/comppol 1
```

```
name "comp1"  
minsize 1  
ena
```

SSL Configuration

```
/c/slb/ssl/certs/key eyal  
/c/slb/ssl/certs/import key "eyal" text  
-----BEGIN RSA PRIVATE KEY-----  
Proc-Type: 4, ENCRYPTED  
DEK-Info: DES-EDE3-CBC, 7CF09B3A26EC2762  
  
/ptw/nuDUhrnMM5+OXN4oJj3lSVp7gzZgf97G//QxFBXPT8DU6Mwxu4uYDY954Ow  
299xQwTh3lBniAPuObUAoN5+14IxZS50HueiOpP7sPySRKem79pKFQFHKYU0aKG0  
HKqdTJRAK/4YSG40xd5+cM7cTopk9p57uQ2LMVAXOmWV/LxA4ALKVoOCKEWIZPEZ  
98tTpoXmsv7BmEhniu6WZxgzgCIaOc/zGPuvGLwJeQTwo/5j6t23YM6Ps/UiqvNI  
t2YqZiIhpODO+vXaPE65mAZY/y8JmrAnVt550IXTLxJwSmXJn50WuRJsCcwlmYgHA  
1PbFLlnXt8tHgjoCsQYKecDJZRLNi/sjeji4bsaEEjd6XVLtrc9sRW2MDojXAojZ  
8ncbWbT+UDTLupXrCQyeJdnDo+9h7iqTNG3YKHwVmCp0ufBvYO3yNVNS4fKIwDRE  
Y8YNIA8GO4O18w9fE898xnOqmBd/Y0BQ8zGIAiT1BHJ85bFp3puGluJOLhnyHmCO  
SeZKJWaIeWeXVH+yT3HJvJEgDHaJ0SzBA5L++EZVgR9B0ipqf8CcRG1HRhYiqY2Z  
+LO4OteG1fZzX1lDVfuC0jBC4RsaD7knWzko9Fe7Gp4lmo4wvXfsZP11Gq+8Yqd2  
uE4Hqs9BN1WwcUEL5dzAGxAZAKf1IcHO9g+6Y/5HG052a5DfctJ4CYBreDruJDBT  
o+ZjOPodVOACqbH+gwnzwYXEehslC1aSlmwoV7v7bkoutlxvkwejCs3uz4F1mFZU  
+hhe/ZaYeaJOMlznBporTGoM4nwy7MuSyrhvnfWSZojtsBUo6f/qtXp0XLsgN+ov  
MqJFif9rjMOIqVYkP7UyZ92XyVYW04e8ta4jvCqi8Mut1xKQAYz7zKDwzp9jy4YN  
4/8RK57Q+BRQtzO1e+vZX5qSpJ9Hw6M/gVTAbxGf+itemb/ez8rtH2zofKc7e8Mu  
NGpobGL2e+lS8/qHaSq3Y4KIPZzUBUI5pTA+VPRmr7uL16B4x9OkeiXhxymfAHSa  
Ky6jn4AdsJ1fbIECJyCLsD0d4hCSDXEzPBzz8kU6hi85pNXjoEIXVCgcrYkpQ7Hc  
4Me5fRQe/jbUTULCR/JRvmH1TpmUTdPVLE1TX/R4PpMIoz1bCNLkBZWP7tmH9Q8h  
Wr+7qk+mGCxw1C1QafpokiWY5XbSn56jWG34IPH2G86v6qe9M6CwfPAY3J1cOPZT  
g+ox3ccTx+jvFZ9jASDSzM92w46ZJNX/0rIKS4OQehU5wpYQu32OFBveadAojdh1  
6a8XB4UyH+UVk5WOzDjSxy5cpOUTO1qQORBIks8GwV+t07ruL0JSN/hVjJpa5mU5  
oMuKbaTqLB9gJwUMuFv3oSe9bCt8MkC7sN2elRaU9tttd/m1+CDat549Y81P4/lWr  
khKDK/s+juj5/wRGfsvpxZck9e79HnxW+XencSB0EZutsdskTdyCZav+r4xqXvKh  
9MI4nHyDfT27mEr9v5Mhw34aTnxvl67VqQCntCGoV9gTkwnGY1Ph/B3rkkCg9FSi  
8Sv25u058aQQbeabCwrmjMIiG96zqLJcoNi//wWKLXWY/lFCgMBF0/w==
```

-----END RSA PRIVATE KEY-----

/c/slb/ssl/certs/srvrcert eyal

/c/slb/ssl/certs/import srvrcert "eyal" text

-----BEGIN CERTIFICATE-----

MIIHKTCCBhGgAwIBAgITJQAAABIycTZoBR5QpQAAAAAAEjANBgkqhkiG9w0BAQUF
ADBPMRMwEQYKCZImiZPyLGBGRYDY29tMRswGQYKCZImiZPyLGBGRYLTHluY3Jh
ZHdhcmUxGzAZBgNVBAMTEkx5bmNyYWR3YXJlLUFEMs1DQTAeFw0xMzA0MDkyMTI5
NTVaFw0xNTA0MDkyMTI5NTVaMF4xCzAJBgNVBAYTAklMMQswCQYDVQQLIEwJJDDEL
MAKGA1UEBxMCSUwxEADAQBgNVBAoTB1JhZHdhcmUxIzAhBgNVBAMTGkx5bmNSRDIw
MTMubHluY3JhZHdhcmUuY29tMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKC
AQEAp365p4j62zL6m880qeQApa0/LIYrKSELV104ix5gxhlm9xjIuCMcnlvWsm1/
dVwP3fMhqzKkIXV1iHLIXhgFTNYiScpluTytjC9w7P7rdya73BoobAYPHFeRwJ7
sE36lJN9qluEE8eX84cEbo+R4KMJGphjVNJbKcG9StiQEGR79d/OqZgDzP+fSnXF
2TMqt1osfHO5AYBy/sQUGBQCRpNSt4bgSCnzPk88QpEF4tOwNjLn1tXpSUYU27tH
l1caGWwRSbWtVfBvLAjfx8SEMNDf9N7kGVpme53w+DYiJPsp7wAwUmku48RJXSLh
pz5RQHhvYZCnYcqjk8qVliDkzwIDAQAB04ID7TCCA+kwdgYDVR0PAQH/BAQDAgWg
MCEGCSsGAQQBgjCUAgQUHhIAVwBlAGIAUwBlAHIAAdgBlAHIEwYDVR0lBAwwCgYI
KwYBBQUHAWEwHQYDVR0OBBYEFKR12YsBPu07Z+8CFYHbkXQolp57MIIBJgYDVR0R
BIIBHTCCARME3NpcC5MeW5jcmFkd2FyZS5jb22CGkx5bmNSRDIwMTMubHluY3Jh
ZHdhcmUuY29tghNGRTEubHluY3JhZHdhcmUuY29tghZkaWFsaW4ubHluY3JhZHdh
cmUuY29tghRtZWV0Lmx5bmNyYWR3YXJlLmNvbYIUam9pbi5seW5jcmFkd2FyZS5j
b22CFWFkbWluLmx5bmNyYWR3YXJlLmNvbYIaTHluY1dlYkludC5seW5jcmFkd2Fy
ZS5jb22CJEx5bmNkaXNjb3ZlckludGVybmFsLkx5bmNyYWR3YXJlLmNvbYIwV2Vi
RXh0Lmx5bmNyYWR3YXJlLmNvbYIcTHluY2Rpc2NvdmVYLkx5bmNyYWR3YXJlLmNv
bTAFBgNVHSMEGDAWgBTRgmmr/umn/o6pLaiCcc0MlQQuMzCCAQsGA1UdHwSCAQIw
gf8wgfyggfmggfaGgbVsZGFwOi8vL0NOPUx5bmNyYWR3YXJlLUFEMs1DQSxDTj1h
ZDEsQ049Q0RQLENOPVB1YmXpYyBLZXkgU2VydmljZXMsQ049U2VydmljZXMsQ049
Q29uZmlndXJhdGlvbixEQz1MeW5jcmFkd2FyZSxEQz1jb20/Y2VydG1maWNhdGVS
ZXZvY2F0aW9uTG1zdD9iYXNlP29iamVjdENsYXNzPWNSTERpc3RyaWJldGlvb1Bv
aW50hjxodHRwOi8vYWQxLkx5bmNyYWR3YXJlLmNvbS9DZXJ0RW5yb2xsL0x5bmNy
YWR3YXJlLUFEMs1DQS5jcmwwggEkBggrBgEFBQcBAQSCARYwggESMIGxBggrBgEF
BQcwAoaBpGxkYXA6Ly8vQ049THluY3JhZHdhcmUtQUQxLUNBLENOPUFJQSxDTj1Q
dWJsaWMG52V5IFN1cnZpY2VzLENOPVn1cnZpY2VzLENOPUNvbmZpZ3VyYXRpb24s
REM9THluY3JhZHdhcmUsREM9Y29tP2NBQ2VydG1maWNhdGU/YmFzZT9vYmplY3RD
bGFzcj1jZXJ0aWZpY2F0aW9uQXV0aG9yaXR5MFwGCCsGAQUFBzACh1BodHRwOi8v

```
YWQxLkx5bmNyYWR3YXJlLmNvbS9DZXJ0RW5yb2xsL2FkMS5MeW5jcmFkd2FyZS5j
b21fTHluY3JhZHdhcmUtQUQxLUNBLmNydDANBgkqhkiG9w0BAQUFAAOCAQEAZ1Xr
z36PKvEByjmeaejZaFZ3nD6hrUHsceBKNhzIeeMX2bGtiYgWtjyMoMITmiUG6GbI
M4fcEZu9w1W72o1SHOY791cBVDSzNbXNbelPJuKAKUQBviGY4jf1UEoj10/Um989
mjefQseeYeEPi32w+m10Vugx6xrqmFIbu9wtHgSnhJzT99rNA3FREpDeURgdhF/t
voNNvReCXoFU+RTTr+JE6PPAXchuRjCE/A6c+YxQQASJ5hXXSvzBwirsr4HVhGL3
d8OUr6Go9wLoYjz5/ncj351PdbwJwq3+3NdlzWkbft4QyiknHtH1THs7o5Vn7JY0
Wwn0SSvYT+WVNxtEMg==
-----END CERTIFICATE-----
```

```
/c/slb/ssl
  on
/c/slb/ssl/sslpol 1
  name "MS-WSMAN"
  convert disabled
  bessl enabled
  ena
```

Health Monitoring Configuration

```
/c/slb/advhc/health hc1 TCP
```

Alteon Internal Standby Configuration

Network Configuration

```
/c/port 1
  pvid 526
/c/12/vlan 1
  learn ena
  def 0
/c/12/vlan 526
  ena
  name "526"
  learn ena
  def 1
/c/12/stg 1/clear
/c/12/stg 1/add 1 2 526
```

```
/c/sys/sshd/ena
/c/sys/sshd/on
/c/l3/if 1
  ena
  ipver v4
  addr 192.168.1.3
  vlan 526
/c/l3/gw 1
  ena
  ipver v4
  addr 192.168.1.254
```

Sync Configuration

```
/c/slb/sync
  prios d
  certs e
  state e
/c/slb/sync/peer 1
  ena
  addr 192.168.1.2
```

PIP Configuration

```
/c/slb/pip/type vlan
/c/slb/pip/type port
/c/slb/pip/add 192.168.1.98 1
```

VRRP Configuration

```
/c/l3/vrrp/on
/c/l3/vrrp/vr 1
  ena
  ipver v4
  vrid 1
  if 1
  addr 192.168.1.1
/c/l3/vrrp/vr 2
  ena
```

```
ipver v4
vrid 2
if 1
addr 192.168.1.200
/c/13/vrrp/vr 3
ena
ipver v4
vrid 3
if 1
addr 192.168.1.230
/c/13/vrrp/vr 4
ena
ipver v4
vrid 4
if 1
addr 192.168.1.170
/c/13/vrrp/vr 5
ena
ipver v4
vrid 5
if 1
addr 192.168.1.160
```

Alteon External Active Configuration

Network Configuration

```
/c/port 1
pvid 530
/c/port 2
pvid 529
/c/12/vlan 1
learn ena
def 0
/c/12/vlan 2
dis
learn ena
```



```
def 0
/c/12/vlan 529
  ena
  name "529"
  learn ena
  def 2
/c/12/vlan 529/ip6nd
  rltime 180
  opinfo disabled
  apinfo disabled
/c/12/vlan 530
  ena
  name "530"
  learn ena
  def 1
/c/12/vlan 530/ip6nd
  rltime 180
  opinfo disabled
  apinfo disabled
/c/12/stg 1/clear
/c/12/stg 1/add 1 2 529 530
/c/sys/sshd/ena
/c/sys/sshd/on
/c/13/if 1
  ena
  ipver v4
  addr 11.1.21.11
  mask 255.255.255.0
  broad 11.1.21.255
  vlan 530
/c/13/if 2
  ena
  ipver v4
  addr 11.1.10.11
  mask 255.255.255.0
  broad 11.1.10.255
```

```
vlan 529
/c/l3/gw 1
  ena
  ipver v4
  addr 11.1.21.250
```

Real Server Configuration

```
/c/slb/real 1
  ena
  ipver v4
  rip 11.1.10.1
  name "Lync.edge.SIP.server.1"
/c/slb/real 2
  ena
  ipver v4
  rip 11.1.10.2
  name "Lync.edge.SIP.server.1"
/c/slb/real 3
  ena
  ipver v4
  rip 11.1.10.5
  name "Lync.edge.Meeting.server.1 "
/c/slb/real 4
  ena
  ipver v4
  rip 11.1.10.6
  name "Lync.edge.Meeting.server.2"
/c/slb/real 5
  ena
  ipver v4
  rip 11.1.10.3
  name "Lync.edge.AV.server.1 "
/c/slb/real 6
  ena
  ipver v4
  rip 11.1.10.4
```

```
name "Lync.edge.AV.server.2"
```

Servers Group Configuration

```
/c/slb/group 1
  ipver v4
  health hc1
  add 1
  add 2
  name "Lync.edge.HTTPS.SIP.443"
/c/slb/group 2
  ipver v4
  health hc1
  add 3
  add 4
  name "Lync.edge.meeting.443"
/c/slb/group 3
  ipver v4
  health hc1
  add 5
  add 6
  name "Lync.edge.av.443"
```

Alteon Process Directions

```
/c/slb/port 1
  client ena
  server ena
/c/slb/port 2
  client ena
  server ena
```

Virtual Servers Configuration

```
/c/slb/virt 1
  ena
  ipver v4
  vip 11.1.21.200
  vname "Lync.edge.SIP.HTTPS.443"
```

```
/c/slb/virt 1/service 443 https
  group 1
  rport 443
  dbind ena
  tmout 30
  ptmout 30
/c/slb/virt 1/service 5061 basic-slb
  group 1
  rport 5061
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/virt 1/service 5269 basic-slb
  group 1
  rport 5269
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/virt 2
  ena
  ipver v4
  vip 11.1.21.201
  vname "Lync.edge.av.HTTPS.443"
/c/slb/virt 2/service 443 https
  group 3
  rport 443
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/virt 3
  ena
  ipver v4
  vip 11.1.21.201
  vname "Lync.edge.STUN.3478"
/c/slb/virt 3/service 3478 basic-slb
  group 3
```

```
rport 3478
protocol udp
pbind clientip norport
tmout 30
ptmout 30
/c/slb/virt 4
  ena
  ipver v4
  vip 11.1.21.202
  vname "Lync.edge.meeting.HTTPS.443"
/c/slb/virt 4/service 443 https
  group 2
  rport 443
  pbind clientip norport
  tmout 30
  ptmout 30
/c/slb/real 1/layer7
  addlb 1
/c/slb/real 2/layer7
  addlb 1
/c/slb/real 5/layer7
  addlb 1
/c/slb/real 6/layer7
  addlb 1
/c/slb/virt 1/service 443 https/pbind sslid
```

Sync Configuration

```
/c/slb/sync
  prios d
  certs e
  state e
/c/slb/sync/peer 1
  ena
  addr 11.1.21.12
```

VRRP Configuration

```
/c/13/vrrp/vr 1
  ena
  ipver v4
  vrid 1
  if 1
  prio 254
  addr 11.1.21.10
/c/13/vrrp/vr 2
  ena
  ipver v4
  vrid 2
  if 2
  prio 254
  addr 11.1.10.10
/c/13/vrrp/vr 3
  ena
  ipver v4
  vrid 3
  if 1
  prio 254
  addr 11.1.21.200
/c/13/vrrp/vr 4
  ena
  ipver v4
  vrid 4
  if 1
  prio 254
  addr 11.1.21.201
/c/13/vrrp/vr 5
  ena
  ipver v4
  vrid 5
  if 1
  prio 254
```

```
addr 11.1.21.202
```

Alteon External Standby Configuration

Network Configuration

```
/c/port 1
  pvid 530
/c/port 2
  pvid 529
/c/l2/vlan 1
  learn ena
  def 0
/c/l2/vlan 2
  dis
  learn ena
  def 0
/c/l2/vlan 529
  ena
  name "VLAN 529"
  learn ena
  def 2
/c/l2/vlan 530
  ena
  name "VLAN 530"
  learn ena
  def 1
/c/l2/stg 1/clear
/c/l2/stg 1/add 1 2 529 530
/c/sys/sshd/ena
/c/sys/sshd/on
/c/l3/if 1
  ena
  ipver v4
  addr 11.1.21.12
  mask 255.255.255.0
  broad 11.1.21.255
```

```
    vlan 530
/c/13/if 2
    ena
    ipver v4
    addr 11.1.10.12
    mask 255.255.255.0
    broad 11.1.10.255
    vlan 529
/c/13/gw 1
    ena
    ipver v4
    addr 11.1.21.250
```

VRRP Configuration

```
/c/13/vrrp/on
/c/13/vrrp/vr 1
    ena
    ipver v4
    vrid 1
    if 1
    addr 11.1.21.10
/c/13/vrrp/vr 2
    ena
    ipver v4
    vrid 2
    if 2
    addr 11.1.10.10
/c/13/vrrp/vr 3
    ena
    ipver v4
    vrid 3
    if 1
    addr 11.1.21.200
/c/13/vrrp/vr 4
    ena
    ipver v4
```



```
vrid 4
if 1
addr 11.1.21.201
/c/13/vrrp/vr 5
ena
ipver v4
vrid 5
if 1
addr 11.1.21.202
```

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