

COMMUNICATIONS SLB SBC Configuration Guidelines

Revision History

Version	Author	Description of Changes	Date Revision Completed
520-0045-00	Patrick Timmons	Initial Release	01/20/2012
520-0045-01	Soumil Vora	Update formatting and show running configs	08/01/2013
520-0045-02	Bhaskar Reddy	Rebranding with latest release information	07/12/2018
	Gaddam		

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Abstract

The use of the RFC 2119 keywords is an attempt to assign the correct requirement levels ("MUST", "SHOULD", "MAY", etc.).

This document defines a series of recommendations for Session-Aware Load Balancer (SLB) and SBC configuration on the Oracle Corporation AP6100 in a customer's production network. They should be used when either (a) deploying a new SLB/SBC, or (b) updating an existing configuration made before Best Current Practices were in place. When in conflict with Customer requirements or desires, the Customer's preference SHOULD take precedence.

Applicability

This document is applicable to AP6100 (running 7.3.0 or newer) in the role of the Session-Aware Load Balancer (SLB) and NN6100/NN4600 (running S-CZ8.1.0 or newer) Session Directors.

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July 2018

Introduction

As service providers deploy larger and larger SIP access networks, scalability problems are presenting unique challenges, particularly from an operational standpoint. Deployments that scale beyond the number of users serviceable by a single Session Border Controller (SBC) – as well as deployments that use a geographically redundant SBC for catastrophic fail over purposes – encounter edge reachability problems. In general there are two coarse techniques that carriers use today to support end-point populations that exceed one SLB's capacity: they either use a DNS-based distribution mechanism, or they will pre-provision endpoint to point to specific SBCs (manually load balancing them). Each of these solutions has its drawbacks. End users – many of them familiar with load balancing equipment deployed to scale protocols such as HTTP or SMTP – have expressed interest in a device that will perform dedicated load balancing for their SIP endpoint.

The Subscriber-Aware Load Balancer (SLB) addresses the need for scaling a network edge to millions of endpoint. Designed as a standalone system, the network architect can deploy an Acme Packet 6100, capable of supporting up to ten million endpoints (where an endpoint is defined as a unique source and destination IP address), the SLB aggregates signaling from large endpoint populations to reduce the edge reachability problem by an order of magnitude.

The network architect reduces this problem by deploying clusters of SBCs or Oracle Communications Unified Session Managers (USM) supported by the SLB. These SBCs can be operating as either Physical Network Functions (PNFs) and Virtual Network Functions (VNFs). The SLB supports clusters of homogenous or heterogenous groups of PNFs and/or VNFs.

Configuration guides are available for download from the Oracle Corporation Customer Support Portal (<u>https://docs.oracle.com</u>). Please contact your Oracle Corporation Systems Engineer for other Best Current Practice (BCP) documentation.

Functional Overview:

The Subscriber-Aware Load Balancer (SLB) is a discrete network element that processes all SIP end-point signaling traffic entering the service provider network. The SLB is not necessarily the first network device to receive signaling traffic, as, depending on network topology, additional network components (for example, routers, network address translators, and so on) can lie between the end-point and the SLB.

Upon receipt of a SIP packet from an unknown source, the SLB uses a provisioned policy to select an appropriate next-hop Session Border Controller (SBC) for traffic originated by that end-point. Subsequent packets from the same end-point are forwarded to the same SBC. The first packet, the one used to make the route decision, and all subsequent packets sent through the SLB to the next-hop SBC are encapsulated within an IP-in-IP format as defined in RFC 2003, IP Encapsulation within IP.

SBCs that participate in the load balancing-enabled deployment are enhanced by several capabilities. First, the SBC supports RFC 2003 tunnel for both packet transmission and reception. Second, the SBC periodically transmits health and performance data to the SLB; such information is evaluated and entered into the SLB's route determination algorithm. Lastly, the SBC participates in any SLB-initiated rebalance operation, as described in the Rebalancing section. A group of SBCs, with the above-listed capabilities, that receive signaling traffic from the SLB, is referred to as a cluster.

2 Intended Audience

This document is intended for use by Oracle Corporation Systems Engineers, third party Systems Integrators, and end users of the Session-Aware Load Balancer and Session Director. It assumes that the reader is familiar with basic operations of Acme Packet's ACLI, and has attended the following training courses (or has equivalent experience):

https://docs.oracle.com/cd/E95619 01/html/esbc ecz810 configuration/

It also presumes that the reader is familiar with standard configuration models and archetypes; for more information, published in our Best Current Practice series of documentation.

3 Background

The popularity of consumer VoIP services has stimulated a rapid growth of carriers' networks to support those services. As the number of devices attaching to a network climbs, the "edge discovery" problem for those devices climbs commensurately. Session Border Controllers, such as Acme Packet's Session Director, are logically situated at the border between a public network (e.g., the Internet) and a private carrier network. These SBCs have a finite capacity for handling user traffic, and therefore each member of the growing user population needs to select from one of many possible border points into their service provider's network.

This raises some interesting design challenges for service providers; first, how do endpoints choose their SBC. Historically, the predominant technology for attaching endpoints to SBCs is to use DNS. While it is a venerable protocol (and therefore well understood, easy to manage, scalable, and presumably part of large IP networks already), it is not particularly well suited to SIP networks for a number of reasons. Endpoint implementation decisions aside, using DNS to make distribution decisions is non-deterministic; that is, any number of intermediaries between a DNS client and a DNS server can cache data, thereby losing granular control over when services advertised or withdrawn by the DNS server are effective. Further, while DNS can use information about the requestor to influence its response, most DNS distribution algorithms are extremely rudimentary (round-robin).

The second design challenge carriers face is how to manage the user attachment to the network, for troubleshooting or sizing purposes. When investigating a customer issue, it is impractical to hunt through all potential entry points for state data related to a specific user. And as the capacity on existing systems rises, adding a system to increase overall service capacity, while redistributing users among the increased pool of resources without service disruption is a delicate, costly operation.

The Oracle Corporation clustering model using the SLB is designed to scale access networks up to two million individual connections, while eliminating dependencies on the endpoint (DNS behavior, 3xx redirect behavior, etc.) and providing a clean, simple, adaptable interface into and out of a carrier's network. By using an SLB as the entry point into a cluster of back-end SBC equipment, the edge discovery problem is reduced by an order of magnitude, and the SLB's flexible policy-driven distribution architecture puts endpoints where they belong – even if the network topology changes. The SLB and SDs form a cohesive unit, relaying performance and platform data to optimize the distribution of resources among all devices.

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Design Goals

The intents of the configurations in this document are to:

- · Minimize interoperability issues by standardizing field configurations
- Provide guidelines for new users to the Session-Aware Load Balancer and Session Director
- Document when and why configuration elements should be changed from their default values
- Facilitate transition of customers from Systems Engineering to Technical Support by making configurations consistent (yielding predictable behavior)
- Illustrate how to transition existing Session Directors into a cluster fronted by a Session-Aware Load Balancer by highlighting the configuration changes required from standard, non-clustered BCP examples.

Further, each design considers the following aspects (in order of priority):

- Flexibility: how resilient the configuration is, and how adaptable the configuration is when turning up new connected networks (for example)
- Performance: minimizing the use of "heavy" configuration objects, to streamline the message flow through the box and reduce CPU usage.
- Scalability: minimizing redundant configuration objects and setting a template based foundation to allow overlay configuration with minimal disruption
- Compatibility: working with other popular devices in carriers' VoIP networks

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Notes on the Reference Configurations

All of the configurations presented here have been entered, tested, and verified on a SD in the lab at headquarters. The goal is not to demonstrate a full-featured configuration; rather, each contains only the minimum number of configuration objects required to pass basic SIP transactions. The appendices of this document provide a single working, tested instance of each of the SLB and supporting SD configurations. Only the default SLB distribution policy (i.e., round-robin) is employed by this sample.

In all cases, the design uses a single "untrusted" network, in the 192.168.11.0/24 subnet, and a single "trusted" network using 192.168.12.0/24. The configurations have been designed such that no 192.168.12.0/24 IP addresses are leaked into signaling messages sent to the untrusted network. Additionally, a "tunnel" network exists in cluster configurations that are not present in standard SBC applications. This is a network that exists in the signaling plane between an SLB and the SBCs in its cluster. The sample tunnel network in this document uses a 172.16.0.0/16 private network space, although please note this tunnel network may exist over any routable IP network (public or private, localized or geographically spread).

The IP address to which UAs send their SIP signaling in all cases is 192.168.11.101 on the SLB; this is represented as (a) in the figure below. Note that this address is also present in the sample SD configuration and represented in the diagram as address (c); however, the SD does not advertise this address on its network. The SD only uses this address via the IP-in-IP tunnel established between it and its SLB. The tunnel IP addresses, (b) and (d) in the diagram, are on the tunnel network, and are 172.16.0.100 and 172.16.0.200, respectively. The IP address (e) from which the SD sends its messages to the core infrastructure is 192.168.12.100. Depending on the configuration model, there may be more addresses used on either network; this will be noted as applicable. The SIP registrar used for testing is located at 192.168.12.200, depicted as address (f).

+		F	++	+	
		= = = = = = = = = = = = = = = = = = =	=		++
(a)	SLB	(b) (d) (c) SD	(e)	(f) REG
		= = = = = = = = = = = = = = = = = = =	=		++
+		+ (IP-in-IP tunnel)	++	+	

No Denial of Service (DoS) configuration has been applied on the SD's configuration, save the application-layer access control features of the sip-interface. Only rudimentary DoS configuration is applied to the SLB, in the form of its max-untrusted-percentage. (This value represents the maximum percentage of the SLB's forwarding table that is available to untrusted/temporary entries.) NOTE: in its present state, the interface used for CCP messaging is instantiated as an "untrusted" flow; this means that it is possible to overwhelm a cluster with a DoS attack, as congestion on the interface between the SLB and SD will cause keep-alive signaling to be throttled – causing the SLB to believe that the SD has failed. It is therefore STRONGLY RECOMMENDED to configure a static, trusted ACL on the SLB for each SD in the cluster (or a subnetted ACL that covers them, etc.).

Note that registration-caching must be ENABLED on the appropriate sip interface when clustering an SD. The SD uses this cached registration data for organizing and prioritizing its endpoint data during cluster rebalancing operations.

The systems used for testing purposes were configured in a high availability environment. For more information on configuring High Availability on the Session Director, refer to the pertinent BCP documentation for the latest best practices. For more information on configuring High Availability on the Session-Aware Load Balancer, refer to Section 6 of this document.

Best Current Practices for object naming conventions have been followed whenever possible.

6

Session-Aware Load Balancer Configuration

The SLB configuration is deliberately kept simple. Aside from the usual array of "platform" configuration elements (e.g., system-config, phy-config, etc.) one must only configure two global configuration settings, and any desired, specific distribution policies. (Note that in the absence of any configured distribution policies, the SLB will default to a round-robin mode of operation, which is what the sample configuration presents.)

6.1. The cluster-config element

The default values of the cluster-config element have been chosen to be applicable to the majority of deployment scenarios. Various configuration settings should be specifically considered when deploying the SLB, however.

The boolean value "auto-rebalance" governs whether or not the addition of a new SD to a cluster will trigger a rebalance operation within that cluster (i.e., each pre-existing SD will migrate some percentage of their user population to fill this new vacancy). Should a carrier's preference be to keep traffic static upon node insertion, this value should be set to disabled; the result of this configuration will be that the newly added SD is considered the de facto highest preference for new users (so it should fill up rapidly). In most cases auto-rebalance should be set to enabled.

The rebalance-skip-ahead value (represented in milliseconds) controls how far into its time-ordered list of endpoint expiry times the SD will skip to find candidates for rebalancing to other SDs when asked to nominate candidates by the SLB. By default (and when the rebalance-skip-ahead value is set to 0) the SD will nominate users at the "top" of its time-ordered list; that is, the users expiring most imminently will be the ones chosen. However, this introduces a distinct possibility for a race condition, where the SD nominates a user whose refresh REGISTER is already 'in flight' towards the SLB. By setting this field to a non-zero value (such as the recommended value of thirty seconds, or 30000), the SD will nominate users set to expire thirty seconds from the time of the request from the SLB. This significantly mitigates the likelihood of an SD nominating an endpoint about to send its REGISTER, introducing a state abnormality among the cluster members. The value of thirty seconds was selected deliberately to roughly coincide with the duration of a typical SIP REGISTER transaction. Likewise, the rebalance-max-refresh will allow an operator to establish a ceiling on the time differential between when an endpoint may be moved (deleted on the SLB) and when it is expected to refresh its registration through the SLB. As a move operation from one SD to another SD will necessarily introduce a window of unavailability for that endpoint to receive calls successfully via the cluster, it is oftentimes desirable to control that window explicitly. A carrier willing to expose their users to no more than five minutes of downtime during a cluster rebalance operation, for example, could set rebalance-max-refresh to 300000. In this way, only users due to expire five minutes from the receipt of the rebalance request from the SLB would be considered candidates for migration.

The session-multiplier field is used to derive the occupancy for a given Session Director in the duster. Occupancy is essentially the governing factor for which SD is chosen for a new endpoint assignment, when all other factors are equal. Said another way, if two systems are identically configured and a new endpoint signals into the cluster, the one with the lowest occupancy is the one that will be selected. When an SD first joins the cluster (handshakes into the SLB), it will provide several aspects of its configuration – among them its licensed session capacity, and its maximum endpoint capacity (if configured). If its maximum endpoint capacity is configured (sip-config -> registration-cache-limit), then this is considered the maximum occupancy of the SD. If it is not configured, the SLB uses the product of the licensed capacity and the session-multiplier field from the cluster-config. As an example, using the default session-multiplier of 10, an SD with 16,000 licensed sessions will receive no more than 160,000 endpoint assignments from the SLB. The default session-multiplier should be adequate for most applications, but it is important to evaluate it independently for each cluster deployment.

6.2. The lbp-config element

Generally speaking, no configuration changes (aside from any relative to high availability) are usually necessary in the lbp-config element; the default values are adequate.

However, certain deployment scenarios may justify changing the untrusted-grace-period timer from its default of 30 (seconds) to a higher value. In a typical access configuration, the untrusted sip-interface is configured to restrict its use to registered endpoints only (allow-anonymous->registered). There are some instances, however, where this security feature is either not applied, or is deliberately overridden by configuration specific to emergency calling.

In its present incarnation, the SLB will only migrate a user from its 'untrusted' list to its 'trusted' list via a promotion message sent by the SD specific to that user; in turn, today's SBC incarnation will only send this promotion message to the SLB after a successful REGISTER/200 OK exchange has occurred. The net result of this is that an anonymous caller, sending an INVITE to an SD where the user is not currently registered, will complete their call but the SLB will never 'trust' that user. After the untrusted-grace-period elapses, the SLB will 'forget' about that particular endpoint-to-SD association, and the user's subsequent signaling messages will be subject to new distribution decisions. Adjusting the untrusted-grace-period timer value to match the user's registration interval will allow the association to exist long enough for that anonymous caller to re-REGISTER during their call, and hence get promoted by the SD after the REGISTER/200 OK. (Note: even if a user gets redistributed to a different SD during an active call it should not interrupt their call in progress, as RTP never flows through the SLB; the redistribution would only affect in-dialog signaling messages such as the BYE, etc.)

6.3. Configuring distribution policies (lb-policy)

The SLB's distribution policies, configured using lb-policy configuration objects, are where customer-specific mappings from endpoints to supporting SDs are defined. As such, no specific configuration advice is pertinent in this BCP.

In the absence of any configured lb-policy objects, the SLB's default behavior is to round-robin all inbound requests among all SDs that advertise support for the service interface upon which the request arrived at the SLB. If round-robin behavior is all that is desired, no lb-policy elements SHOULD be configured. However, any advanced routing will require the use of one or more lb-policy configuration objects to define the desired mapping of inbound endpoints to SDs or groups of SDs.

Fundamentally, lb-policy configuration is roughly analogous to local-policy on the SD; that is, it will match packets to policies using their source address and destination address, prioritize the results, and forward the packet onto the "best" match. Unlike local-policy matching, however, the "source realm" is not part of the matching key on ingress packets, since the SLB is neither aware of, nor configured with, realm data. Combining the local-policy concepts of a 'next-hop' and an (egress) realm within a policy-attribute is the name of a "service partition", defined as the realm identifier on each member SD. Each of these service partitions is configured as an "lb-realm", a sub-element within the lb-policy configuration element. The name of the lb-realm matches the name of one or more realm labels (realm-config -> identifier) of participating SDs.

6.4. High availability configuration

The SLB is responsible for replicating data pertaining to as many as two million endpoints. As such, those familiar with configuring high availability on an SD will notice some recommendations for changing the default values of various timers and transaction journal settings.

In the lbp-config, red-max-trans governs the journal depth for queuing transaction history on the active SLB device. That is, each transaction that occurs on the active SLB is recorded in this journal awaiting a request from the standby SLB to retrieve updates. For scaling up to two million supported endpoints, the recommended value for this configuration setting is 2000000. This will allow for a scenario where the high availability mate of an active SLB is powered off for an extended period of time; when the high availability pair is restored, the journal on the active will be large enough to accommodate a (potentially) large number of transactions that have transpired in the interim.

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In the redundancy-config, the recommended default value for becoming-standby-time is 1620000 (27 minutes). This is to account for the large volume of data a standby can expect to receive from an active, and gives it time to retrieve all of that data and become fully synchronized before this timer expires and it transitions to OutOfService.

The sample configuration is given in Appendix A.

Session Director Configuration

The configuration requirements for introducing a Session Director into a cluster fronted by an SLB were deliberately kept minimal. All that is required is to configure the properties of the tunnel between the SD and SLB, and to flag the relevant application(s) to indicate their participation in a cluster.

7.1. Tunnel configuration

Traditionally, SDs are situated at the border of two networks: an untrusted network and a trusted network. The introduction of an SLB into a network design creates a third network, referred to as a "tunnel network". (Therefore the SLB is said to participate in the untrusted network and the tunnel network, whereas the SDs in the cluster participate in all three of the untrusted, tunnel, and trusted networks.) As the tunnel properties are defined with a network-interface, any realms built upon that network-interface that are configured to communicate with a load balancer (see next section) will use the tunnel. Multiple tunnels may be configured on a single network-interface (differentiated by their name), but only one tunnel per protocol type (e.g., SIP, H248) may be configured within a single network-interface.

7.2. Application configuration

As the application configuration consists solely of either a tunnel identifier field in the sip-interface, or an option within the h248-mgc-config element, no additional information is necessary.

Note that when configuring an SD to support SIP/TCP or SIP/TLS, that the option "reuse-connections" MUST be applied to the access-facing (i.e., tunneled) sip-interface. This is because an SD may try to initiate outbound connections to non-NATted endpoints if the IP:port in the endpoint's Contact-URI does not match its actual L3/L4 address. These connections will fail in the presence of a SLB.

7.3. Media management in a cluster

Be advised that media management (specifically, mm-in-realm) will behave differently as endpoints are strewn among many like-configured SDs. If a customer is intent on releasing media between two users within a realm, you must consider that the realm now extends to the entire cluster; therefore, you must configure msm-release in addition to setting mm-in-realm to disabled.

For more information on configuring msm-release, refer to [2].

8 Maintenance and Troubleshooting

Please refer to the document available at the link below from our support portal for helpful show command outputs and their explanations:-

https://docs.oracle.com/cd/E83022 01/doc/slb scz7310 essentials.pdf

9 References

1. https://docs.oracle.com/cd/E83022_01/index.htm

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APPENDIX A. Reference Configuration: SLB Basic Configuration

cluster			
	-config		
	state	enabled	
	log-level	CRITICA	
	auto-rebalance	enabled	
	source-rebalance-threshold	50	
	dest-rebalance-threshold	0	
	dest-rebalance-max	80	
	tunnel-check-interval	15000	
	tunnel-fail-interval	10000	
	rebalance-request-delay	500	
	session-multiplier	10	
	rebalance-skip-ahead	30000	
	rebalance-max-refresh	0	
	ignore-tgt-svcs-on-rebalance	disable	d
		1	a
	atom-limit-divisor	-	3
	rebalance-del-app-entries	disable	a
	inactive-sd-limit	1800	
	red-port	2001	
	red-max-trans	10000	
	red-sync-start-time	5000	
	red-sync-comp-time	1000	
	service-port		
	address		192.168.11.101
	port		5060
	protocol		UDP
			M00:0
	last-modified-by	admin@c	onsole
	last-modified-date		-03 14:12:44
pt-con		2020 07	00 11 10 11
.pc 0011	min-tru-bw	8000000	
	max-tru-bw	2400000	Ο
	min-untru-bw	3000000	0
	max-untru-bw	9000000	
		CRITICA	т
	log-level		
	last-modified-by	admin@c	
	last-modified-date	2013-07	-03 14:19:45
.bp-con	•		
	state	enabled	
	log-level	CRITICA	L
	untrusted-grace-period	30	
	max-untrusted-percentage	20	
	max-untrusted-upper-threshold	80	
	max-untrusted-lower-threshold	70	
	endpoint-capacity-upper-thres	hold 80	
	endpoint-capacity-lower-thres		
		2000	
	red-port	2000 2000000	
	red-port red-max-trans	2000000	
	red-port red-max-trans red-sync-start-time	2000000 5000	
	red-port red-max-trans red-sync-start-time red-sync-comp-time	2000000 5000 1000	onsole
	red-port red-max-trans red-sync-start-time red-sync-comp-time last-modified-by	2000000 5000 1000 admin@c	
	red-port red-max-trans red-sync-start-time red-sync-comp-time last-modified-by last-modified-date	2000000 5000 1000 admin@c	onsole -03 14:13:53
letwork	red-port red-max-trans red-sync-start-time red-sync-comp-time last-modified-by last-modified-date -interface	2000000 5000 1000 admin@c 2013-07	
network	red-port red-max-trans red-sync-start-time red-sync-comp-time last-modified-by last-modified-date -interface name	2000000 5000 1000 admin@c 2013-07 M00	
network	<pre>red-port red-max-trans red-sync-start-time red-sync-comp-time last-modified-by last-modified-date interface name sub-port-id</pre>	2000000 5000 1000 admin@c 2013-07 M00 0	
letwork	red-port red-max-trans red-sync-start-time red-sync-comp-time last-modified-by last-modified-date -interface name sub-port-id description	2000000 5000 1000 admin@c 2013-07 M00	
network	red-port red-max-trans red-sync-start-time red-sync-comp-time last-modified-by last-modified-date -interface name sub-port-id description A hostname	2000000 5000 1000 admin@c 2013-07 M00 0 .ccess	-03 14:13:53
network	red-port red-max-trans red-sync-start-time red-sync-comp-time last-modified-by last-modified-date -interface name sub-port-id description	2000000 5000 1000 admin@c 2013-07 M00 0	-03 14:13:53
network	red-port red-max-trans red-sync-start-time red-sync-comp-time last-modified-by last-modified-date -interface name sub-port-id description A hostname	2000000 5000 1000 admin@c 2013-07 M00 0 .ccess	-03 14:13:53 .11.101

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	netmask	255.255.255.0
	gateway	192.168.11.1
	sec-gateway	
	gw-heartbeat	
	state	disabled
	heartbeat	0
	retry-count	0
	retry-timeout	1
	health-score	
		0
	dns-ip-primary	
	dns-ip-backup1	
	dns-ip-backup2	
	dns-domain	
	dns-timeout	11
	hip-ip-list	
	ftp-address	
	icmp-address	
	snmp-address	
	telnet-address	
	ssh-address	
	last-modified-by	admin@console
	last-modified-date	2013-07-03 14:05:40
network-	-interface	
neeworn	name	M10
	sub-port-id	0
		tunnel
	description	Cumer
	hostname	190 16 0 100
	ip-address	172.16.0.100
	pri-utility-addr	172.16.0.101
	sec-utility-addr	172.16.0.102
	netmask	255.255.255.0
	gateway	172.16.0.1
	sec-gateway	
	gw-heartbeat	
	state	disabled
	heartbeat	0
	retry-count	0
	retry-timeout	1
	health-score	0
	dns-ip-primary	-
	dns-ip-backup1	
	dns-ip-backup2	
	dns-domain	
		11
	dns-timeout	11
	hip-ip-list	172.16.0.100
	ftp-address	
	icmp-address	172.16.0.100
	snmp-address	
	telnet-address	
	ssh-address	
	tunnel-config	
	local-address	172.16.0.100
	port	4444
	protocol	UDP
	tls-profile	
	last-modified-by	admin@console
	last-modified-date	2013-07-03 14:07:35
network-	-interface	
	name	ethl
	sub-port-id	0
	description	wancoml
	hostname	wattoonit
	ip-address pri-utility-addr	
	Dri HEILIEN Oddr	169.254.1.1

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	sec-utility-addr	169.254.1.2
	netmask	255.255.255.252
	gateway	
	sec-gateway	
	gw-heartbeat	
	state	disabled
	heartbeat	0
	retry-count	0
	retry-timeout	1
	health-score	0
	dns-ip-primary	0
	dns-ip-backupl	
	dns-ip-backup2	
	dns-domain	
		1 1
	dns-timeout	11
	hip-ip-list	
	ftp-address	
	icmp-address	
	snmp-address	
	telnet-address	
	ssh-address	
	last-modified-by	admin@console
	last-modified-date	2013-05-08 11:38:14
network-	interface	
	name	eth2
	sub-port-id	0
	description	wancom2
	hostname	
	ip-address	
	pri-utility-addr	169.254.2.1
	sec-utility-addr	169.254.2.2
	netmask	255.255.255.252
		255.255.255.252
	gateway	
	sec-gateway	
	gw-heartbeat	
	state	disabled
	heartbeat	0
	retry-count	0
	retry-timeout	1
	health-score	0
	dns-ip-primary	
	dns-ip-backup1	
	dns-ip-backup2	
	dns-domain	
	dns-timeout	11
	hip-ip-list	
	ftp-address	
	icmp-address	
	snmp-address	
	telnet-address	
	ssh-address	
	last-modified-by	admin@console
	last-modified-date	2013-05-08 11:38:54
phy-inte		2013 02 00 TT.20.24
	name	M00
		Modia
	operation-type	Media
	operation-type port	0
	operation-type port slot	0 0
:	operation-type port slot virtual-mac	0 0 00:08:25:a2:39:fe
	operation-type port slot virtual-mac admin-state	0 0 00:08:25:a2:39:fe enabled
	operation-type port slot virtual-mac admin-state auto-negotiation	0 0 00:08:25:a2:39:fe enabled enabled
	operation-type port slot virtual-mac admin-state auto-negotiation duplex-mode	0 0 00:08:25:a2:39:fe enabled
	operation-type port slot virtual-mac admin-state auto-negotiation	0 0 00:08:25:a2:39:fe enabled enabled

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	last-modified-by	admin@console		
	last-modified-date	2013-05-23 15:	33:09	
phy-int	erface			
	name	M10		
	operation-type	Media		
	port	0		
	slot	1		
	virtual-mac	00:08:25:a2:39	:ff	
	admin-state	enabled		
	auto-negotiation	enabled		
	duplex-mode	FULL		
	speed	100		
	overload-protection	disabled		
	last-modified-by	admin@console		
	last-modified-date	2013-05-23 17:	15:25	
phy-int	erface			
	name	eth1		
	operation-type	Control		
	port	1		
	slot	0		
	virtual-mac			
	wancom-health-score	8		
	overload-protection	disabled		
l	last-modified-by	admin@console		
	last-modified-date	2013-05-08 11:	44:37	
phy-int	erface			
	name	eth2		
	operation-type	Control		
	port	2		
	slot	0		
	virtual-mac			
	wancom-health-score	9		
	overload-protection	disabled		
	last-modified-by	admin@console		
	last-modified-date	2013-05-08 11:	45:02	
redunda	ncy-config			
	state	enabled		
	log-level	INFO		
	health-threshold	75		
	emergency-threshold	50		
	port	9090		
	advertisement-time	500		
	percent-drift	210		
	initial-time	1250		
	becoming-standby-time	180000		
	becoming-active-time	100		
	cfg-port	1987		
	cfg-max-trans	10000		
	cfg-sync-start-time	5000		
	cfg-sync-comp-time	1000		
	gateway-heartbeat-interval	0		
	gateway-heartbeat-retry	0		
	gateway-heartbeat-fileout	1		
	gateway-heartbeat-timeout gateway-heartbeat-health	0		
	media-if-peercheck-time	0		
	peer	0		
	-	QT.D1		
	name	SLB1	d	
	name state	enable		
	name state type			
	name state type destination	enable	У	
	name state type destination address	enable Primar	y 169.254.1.1:9090	
	name state type destination address network-inter	enable Primar	У	
	name state type destination address	enable Primar	y 169.254.1.1:9090	

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		network-interf	ace		eth2:0
peer	<u>_</u>				
	name			SLB2	
	state			enabled	
	type			Secondai	ry
	destina				160.054.0.0.0000
		address			169.254.2.2:9090
	م الم مراجع الم	network-interf	ace		eth2:0
	destina				169.254.1.2:9090
1		address network-interf	200		169.254.1.2:9090 eth1:0
lagt	-modified-b		ace admin@co	ngole	
	z-modified-d	-		-08 13:54	4:12
phy-interfac		ucc	2010-00-	JU 1J•J•	1.10
name			M10		
	ation-type		Media		
port			0		
slot			1		
	ual-mac				
adm	in-state		enabled		
auto	o-negotiatio	n	enabled		
dup	Lex-mode		FULL		
spee			100		
	cload-protec		disabled	f	
	-modified-b	*	admin@co		
	-modified-d	ate	2013-07-	-03 13:57	7:47
phy-interfac					
name			M00		
	ration-type		Media		
port			0		
slot			0		
	cual-mac		onchici		
	in-state	n	enabled		
	o-negotiatio Lex-mode	11	enabled FULL		
spee			100L		
_	load-protec	tion	disable	F	
	-modified-b		admin@co		
	-modified-d	±		-03 13:58	8:01
system-conf:					
-	iname				
desc	cription		SLB BCP	Config -	- LCX 1.0.0
	ation				
mib-	-system-cont	act			
mib-	-system-name				
	-system-loca	tion			
-	p-enabled	_	enabled	_	
	ole-snmp-aut		disable		
	ole-snmp-sys		disabled		
	ole-snmp-mon		disable		
	ole-env-moni	-	disable	t	
		-table-length	1		
	p-syslog-lev		WARNING		
	cem-log-leve		WARNING		
	cess-log-lev cess-log-ip-		NOTICE 0.0.0.0		
-	cess-log-lp- cess-log-por		0.0.0.0		
	lect		U		
011		interval		5	
	push-in			5 15	
	boot-st			disable	d
1	start-t			now	
	end-tim			never	
		lect-state		disable	d
1	TCG COT			~~~~~~	

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red-max-	trans 1000
red-sync	e-start-time 5000
red-sync	-comp-time 1000
push-suc	cess-trap-state disabled
call-trace	disabled
internal-trace	disabled
log-filter	all
default-gateway	172.41.0.1
restart	enabled
exceptions	
telnet-timeout	0
console-timeout	0
remote-control	enabled
cli-audit-trail	enabled
link-redundancy-	state disabled
source-routing	disabled
cli-more	disabled
terminal-height	24
debug-timeout	0
trap-event-lifet	ime O
default-v6-gatew	ay ::
ipv6-support	disabled
cleanup-time-of-	day 00:00
last-modified-by	admin@console
last-modified-da	te 2013-07-03 13:56:33
task done	

APPENDIX B. Reference Configuration: Basic SD Clustered Configuration

1 1 1	
local-policy from-address	
Irom-address	*
	*
to-address	*
_	*
source-realm	
	Access
description	
activate-time	N/A
deactivate-time	N/A
state	enabled
policy-priority	none
last-modified-by	admin@172.41.1.2
last-modified-date	2013-07-03 11:15:59
policy-attribute	
next-hop	192.168.12.200
realm	Core
action	none
terminate-recursion	disabled
carrier	
start-time	0000
end-time	2400
days-of-week	U-S
cost	0
app-protocol	Ĵ
state	enabled
methods	
media-profiles	
lookup	single
next-key	STUATE
eloc-str-lkup	disabled
	disabled
eloc-str-match	
media-manager	enabled
state	
latching	enabled
flow-time-limit	86400
initial-guard-timer	300
subsq-guard-timer	300
tcp-flow-time-limit	86400
tcp-initial-guard-timer	300
tcp-subsq-guard-timer	300
tcp-number-of-ports-per-flow	2
hnt-rtcp	disabled
algd-log-level	NOTICE
mbcd-log-level	NOTICE
red-flow-port	1985
red-mgcp-port	1986
red-max-trans	10000
red-sync-start-time	5000
red-sync-comp-time	1000
media-policing	enabled
max-signaling-bandwidth	1000000
max-untrusted-signaling	100
min-untrusted-signaling	30
app-signaling-bandwidth	0
tolerance-window	30
rtcp-rate-limit	0
trap-on-demote-to-deny	disabled
anonymous-sdp	disabled

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	arp-msg-bandwidth	32000
	arp-msg-bandwidtn fragment-msg-bandwidth	32000 0
	rfc2833-timestamp	disabled
	default-2833-duration	100
	rfc2833-end-pkts-only-for-nor	n-sig enabled
	translate-non-rfc2833-event	disabled
	media-supervision-traps	disabled
	dnsalg-server-failover	disabled
	last-modified-by	admin@172.41.1.2
	last-modified-date	2012-01-12 20:04:48
networ	k-interface	MOO
	name sub-port-id	M0 0 0
	description	Access Interface
	hostname	Access incertace
	ip-address	172.16.0.200
	pri-utility-addr	172.10.0.200
	sec-utility-addr	
	netmask	255.255.255.0
	gateway	172.16.0.1
	sec-gateway	
	gw-heartbeat	
	state	disabled
	heartbeat	0
	retry-count	0
	retry-timeout	1
	health-score	0
	dns-ip-primary	
	dns-ip-backup1	
	dns-ip-backup2	
	dns-domain	
	dns-timeout	11
	hip-ip-list	172.16.0.200
	ftp-address	172 16 0 200
	icmp-address	172.16.0.200
	snmp-address telnet-address	
	ssh-address	
	signaling-mtu	0
	tunnel-config	Ŭ
	name	sipTunnel
	local-address	172.16.0.200
	remote-address	172.16.0.100
	port	4444
	protocol	UDP
	tls-profile	
	application	SIP
	last-modified-by	admin@172.41.1.2
	last-modified-date	2013-07-03 14:29:08
networ	k-interface	
	name	M10
	sub-port-id	0
	description	Core Interface
	hostname	
	ip-address	192.168.12.100
	pri-utility-addr	
	sec-utility-addr	
	netmask	255.255.255.0
	gateway	192.168.12.1
	sec-gateway	
	gw-heartbeat	disabled
	state heartbeat	0
	retry-count	0
	ICCIY COULC	0

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retry-timeout	1	
health-score	0	
dns-ip-primary		
dns-ip-backupl		
dns-ip-backup2 dns-domain		
dns-timeout	11	
hip-ip-list	192.168.12.100	
ftp-address	192.100.12.100	
icmp-address	192.168.12.100	
snmp-address	1/1/1/00/11/1/00	
telnet-address		
ssh-address		
signaling-mtu	0	
last-modified-by	admin@console	
last-modified-date	2013-05-08 15:47:12	
phy-interface		
name	M0 0	
operation-type	Media	
port	0	
slot	0	
virtual-mac		
admin-state	enabled	
auto-negotiation	enabled	
duplex-mode	FULL	
speed	1000	
overload-protection	disabled	
last-modified-by	admin@172.41.1.2	
last-modified-date	2012-01-12 19:55:26	
phy-interface	M1 0	
name operation-type	Media	
port	0	
slot	1	
virtual-mac	1	
admin-state	enabled	
auto-negotiation	enabled	
duplex-mode	FULL	
speed	1000	
overload-protection	disabled	
last-modified-by	admin@172.41.1.2	
last-modified-date	2012-01-12 19:55:48	
realm-config		
identifier	Access	
description		
addr-prefix	0.0.0	
network-interfaces		
	M00:0	
mm-in-realm	enabled	
mm-in-network	enabled	
mm-same-ip	enabled	
mm-in-system	enabled	
bw-cac-non-mm	disabled	
msm-release	disabled	
qos-enable	disabled	
generate-UDP-checksum max-bandwidth	disabled	
max-bandwidth fallback-bandwidth	0 0	
max-priority-bandwidth	0	
max-priority-bandwidth max-latency	0	
max-fatency max-jitter	0	
max-packet-loss	0	
observ-window-size	0	
CODCLA MILLOOM DITC	•	

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dn=realmmedia-spolicywrtp-mem-passtbroughdisabledout-translationidout-translationidout-translationidout-translationidout-translationidout-translationidmanipulation-stringmanipulation-patternclass-profileaverage-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0average-rata-limit0aver-pacidess-realm30symmetric-latchingdisabledpai-stripdisabledcontent-profileadditional-prefixesrestricted-latchingnonerestricted-latchingnoneuser-cac-madwidth0user-cac-aemodicnoneuser-cac-aemodicnoneuser-cac-aemodic0icomp-detect-multiplier0icomp-detect-multiplier0icomp-detect-multiplier0icomp-detect-multiplier0delay-media-updatedisabledcodec-policydisabledcodec-policy0codec-manip-in-realm <th></th> <th></th> <th></th>			
<pre>media-sec-policy srtp-msm-passthrough disabled in-translationid out-translutionid out-translutionid out-manipulation-string manipulation-string symmetric-latching manipulation-string manipulation-string manipulation disabled math-context carly-media-altok scounting-enable manipulation-string manipulation-string manipulation disabled math-context carly-media-string manipulation-string manipulation-string manipulation disabled delay-media-update disabled stun-senver-ip scounting-server-id stun-senver-ip scounting-server-id stun-senver-ip scounting-server-id stun-server-ip scounting-server-id stun-serv</pre>		dns-realm	
srtp-msm-passthroughdisabledin-translationid		media-policy	
<pre>in-translationid out-translationid in-manipulationid manipulation-string manipulation-string manipulation-string manipulation-string manipulation-string manipulation-string manipulation-string manipulation-string manipulation-string diaccess-control-trust-level none invalid-signal-threshold 0 untrusted-signal-threshold 0 untrusted-signal-threshold 0 untrusted-signal-threshold 0 deny-period 30 ext-policy-svr diam-s2-address-realm symmetric-latching disabled trunk-context early-media-allow enforcement-profile additional-prefixes restriction-mask 32 accounting-enable enabled user-cac-mode none user-cac-bandwidth 0 user-cac-bandwidth 0 user-cac-bandwidte 0 isabled disabled disabled constraint-name call-recording-server-id xmq-state xmg-unknown hairpin-id 0 stun-server-ip 0.0.0.0 stun-server-ip 0.0.0.0 stun-server-port 3478 stun-changed-port 3478 stun-changed-port 3478 stun-changed-port 3478 stun-changed-port 3478 stun-changed-port 3479 match-media-profile block-rtcp disabled hide-serses-media-update disabled hide-serses-media-upda</pre>		media-sec-policy	
out-translationidin-manipulationidmanipulation-patternclass-profileaverage-rate-limit0average-rate-limit0invalid-signal-threshold0untrusted-signal-threshold0untrusted-signal-threshold0attrust-threshold0user-cac-backnoneuser-cac-backwidth0user-cac-backwidth0user-cac-sessions0idemp-detect-multiplier0idemp-detect-multiplier0idemp-detect-multiplier0idemp-detect-multiplier0idemp-trustattrusterattruster-threedisabledcaccounting-server-idattrusterattruster-three		srtp-msm-passthrough	disabled
<pre>in-manipulationid out-manipulationstring manipulation-string manipulation-string manipulation-string maxipulation-pattern class-profile average-rate-limit 0 access-control-trust-level none invalid-signal-threshold 0 maximus-signal-threshold 0 untrusted-signal-threshold 0 deny-period 30 ext-pelicy-svr diam-e2-address-realm symmetric-latching disabled trunk-context early-media-allow enforcement-profile additional-prefixes restriction-mask 32 accounting-enable enabled user-cac-bandwidth 0 user-cac-bandwidth 0 imp-detect-multiplier 0 inmp-datect-multiplier 0 inmp-datect-multiplier 0 inmp-target-ip monthly-minutes 0 net-managemet-control disabled delay-media-update disabled refer-colify-provisional none disabled refer-colify-provisional none disabled constraint-name call-records xrg-unknown hairpin-id 0 stun-enable disabled stun-server-ip 0.0.0.0 stun-enable disabled refer-colify-provisional none disabled constraint-name call-records xrg-unknown hairpin-id 0 stun-enable disabled stun-server-port 3478 stun-changed-port 3478 stun-changed-port 3479 match-media-profile ig-profile sip-profile sip-profile disabled hide-egress-media-update disabled hide-egress-media-update disabled hi</pre>		in-translationid	
out-manipulation-atring manipulation-atring manipulation-atring manipulation-atring manipulation-atring average-rate-limit0average-rate-limit0access-control-trust-levelnoneinvaids-signal-threshold0untrusted-signal-threshold0nat-trust-threshold0att-trust-threshold0att-trust-threshold0diam-22-address-realm30symmetric-latchingdisabledpai-stripdisabledcarly-media-allow		out-translationid	
<pre>manipulation-pattern class-profile average-rate-limit 0 access-control-trust-level none invalid-signal-threshold 0 maximum-signal-threshold 0 untrusted-signal-threshold 0 deny-period 30 ext-policy-svr diam-e2-address-realm symmetric-latching disabled trunk-context early-media-allow enforcement-profile additional-prefixes restricted-latching none restricted-latching none restricted-latching none restricted-latching none user-cac-bandwidth 0 user-cac-andwidth 0 user-cac-andwidth 0 icmp-advertisement-interval 0 icmp-detect-multiplier 0 icmp-advertisement-interval 0 icmp-target-ip monthly-minutes 0 net-management-control disabled refer-call-transfer disabled refer-call-transfer disabled refer-call-transfer disabled constraint-name call-recording-server-id xmg-state xmg-unknown disabled constraint-name call-recording-server-id xmg-state xmg-unknown bium-server-port 3478 stum-server-port 3478 stum-server.port 3479 match-media-profile block-tcp disabled last-modified-by adminuel7.41.1.2 last-modified-by adminuel7.241.1.2 last-modified-date 2012-01-12.20:05:08 realm-config identifier Core description</pre>		in-manipulationid	
<pre>manipulation-pattern class-profile average-rate-limit 0 access-control-trust-level none invalid-signal-threshold 0 untrusted-signal-threshold 0 ant-trust-threshold 0 deny-period 30 ext-policy-svr diam-d2-address-realm symmetric-latching disabled pai-strip disabled pai-strip disabled early-media-allow enforcement-profile additional-prefixes restricted-latching none restriction-mask 32 accounting-enable enabled user-cac-bandwidth 0 user-cac-sessions 0 imp-detect-multiplier 0 imp-detect-multiplier 0 imp-advertisement-interval 0 imp-detect-multiplier 0 disabled refer-call-transfer disabled refer-call-transfer disabled constraint-name call-recordig-server-id xng-state xng-unknown hairpin-id 0 stun-server-port 3478 stun-changed-port 3479 match-media-profiles gos-constraint sig-profile block-tcp disabled last-modified-date 2012-01-12 20:05:08 realm-config identifier Core</pre>		out-manipulationid	
class-profile average-rate-limit 0 access-control-trust-level none invalid-signal-threshold 0 untrusted-signal-threshold 0 untrusted-signal-threshold 0 deny-period 30 ext-policy-svr diam-e2-address-realm symmetric-latching disabled trunk-context early-media-allow enforcement-profile additional-prefixes restricted-latching none restricted-latching none restricted-latching none restricted-latching none user-cac-bandwidth 0 user-cac-sessions 0 imp-advertisement-interval 0 imp-target-ip monthly-minutes 0 net-management-control disabled delay-media-update disabled refer-call-transfer disabled refer-call-transfer disabled constraint-name codec-policy codec-manip-in-realm disabled constraint-name call-recording-server-id xnq-state xnq-unknown dyn-refer-term disabled constraint-name call-recording-server-id xnq-state disabled stun-server-port 3478 stun-changed-ip 0.0.0.0 stun-changed-port 3479 match-media-profile block-tcp disabled last-modified-by administrainter isp-profile sip-profile sip-profile sip-profile sip-profile disabled last-modified-by administrainter disabled last-modified-by administrainter disabled last-modified-by administrainter disabled last-modified-by administrainter disabled last-modified-by administrainter disabled last-modified-by administrainter disabled last-modified-by administrainter disabled last-modified-by core		manipulation-string	
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delay-media-updatedisabledrefer-call-transferdisabledrefer-call-transferdisabledrefer-call-transferdisableddyn-refer-termdisabledcodec-policycodec-policycodec-manip-in-realmdisabledconstraint-namecall-recording-server-idxnq-statexnq-unknownhairpin-id0stun-enabledisabledstun-server-ip0.0.0.0stun-server-port3478stun-changed-ip0.0.0.0stun-changed-port3479match-media-profilesgos-constraintsip-profileblock-rtcphide-egress-media-updatedisabledlast-modified-byadmin@172.41.1.2last-modified-date2012-01-12 20:05:08realm-configCoredescriptionCore			-
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refer-notify-provisional none dyn-refer-term disabled codec-policy codec-manip-in-realm disabled constraint-name call-recording-server-id xnq-state xnq-unknown hairpin-id 0 stun-enable disabled stun-server-ip 0.0.0.0 stun-server-port 3478 stun-changed-ip 0.0.0.0 stun-changed-port 3479 match-media-profiles qos-constraint sip-profile block-rtcp disabled hide-egress-media-update disabled last-modified-by admin@172.41.1.2 last-modified-date 2012-01-12 20:05:08 realm-config identifier Core			
dyn-refer-termdisabledcodec-policydisabledcodec-manip-in-realmdisabledconstraint-namedisabledcall-recording-server-idxnq-unknownhairpin-id0stun-enabledisabledstun-server-ip0.0.0.0stun-server-port3478stun-changed-ip0.0.0.0stun-changed-port3479match-media-profilesgos-constraintsip-profilesip-isup-profileblock-rtcpdisabledhide-egress-media-updatedisabledlast-modified-byadmin@172.41.1.2last-modified-date2012-01-12 20:05:08realm-configidentifieridentifierCore			
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codec-manip-in-realmdisabledconstraint-namecall-recording-server-idxnq-statexnq-unknownhairpin-id0stun-enabledisabledstun-enabledisabledstun-server-ip0.0.0.0stun-changed-ip0.0.0.0stun-changed-port3478qos-constraintsip-profilesqos-constraintsip-profileblock-rtcpdisabledhide-egress-media-updatedisabledlast-modified-byadmin@172.41.1.2last-modified-date2012-01-12 20:05:08realm-configCoredescriptionCore		-	
constraint-namecall-recording-server-idxnq-statexnq-unknownhairpin-id0stun-enabledisabledstun-server-ip0.0.0.0stun-server-port3478stun-changed-ip0.0.0.0stun-changed-port3479match-media-profilesgos-constraintsip-profileisabledblock-rtcpdisabledhide-egress-media-updatedisabledlast-modified-byadmin@172.41.1.2last-modified-date2012-01-12 20:05:08realm-configidentifieridentifierCoredescriptionCore			disabled
call-recording-server-idxnq-statexnq-unknownhairpin-id0stun-enabledisabledstun-server-ip0.0.0.0stun-server-port3478stun-changed-ip0.0.0.0stun-changed-port3479match-media-profiles3479qos-constraintsip-profileblock-rtcpdisabledhide-egress-media-updatedisabledhide-egress-media-update2012-01-12 20:05:08realm-configCoredescriptionCore		-	
xnq-statexnq-unknownhairpin-id0stun-enabledisabledstun-server-ip0.0.0.0stun-server-port3478stun-changed-ip0.0.0.0stun-changed-port3479match-media-profilesgos-constraintsip-profileisabledhide-egress-media-updatedisabledhide-egress-media-updatedisabledlast-modified-byadmin@172.41.1.2last-modified-date2012-01-12 20:05:08realm-configCoredescriptionCore			
hairpin-id 0 stun-enable disabled stun-server-ip 0.0.0.0 stun-server-port 3478 stun-changed-ip 0.0.0.0 stun-changed-port 3479 match-media-profiles qos-constraint sip-profile block-rtcp disabled hide-egress-media-update disabled last-modified-by admin@172.41.1.2 last-modified-date 2012-01-12 20:05:08 realm-config identifier Core		5	xng-unknown
stun-enabledisabledstun-server-ip0.0.0.0stun-server-port3478stun-changed-ip0.0.0.0stun-changed-port3479match-media-profiles		1	
stun-server-ip0.0.0.0stun-server-port3478stun-changed-ip0.0.0.0stun-changed-port3479match-media-profiles		-	0
stun-server-port3478stun-changed-ip0.0.0.0stun-changed-port3479match-media-profiles			
stun-changed-ip0.0.0.0stun-changed-port3479match-media-profiles		-	
stun-changed-port3479match-media-profiles		-	
<pre>match-media-profiles qos-constraint sip-profile block-rtcp disabled hide-egress-media-update disabled last-modified-by admin@172.41.1.2 last-modified-date 2012-01-12 20:05:08 realm-config identifier Core description</pre>			
qos-constraintsip-profilesip-isup-profileblock-rtcphide-egress-media-updatedisabledlast-modified-byadmin@172.41.1.2last-modified-date2012-01-12configidentifiercoredescription			5175
sip-profilesip-isup-profileblock-rtcphide-egress-media-updatedisabledlast-modified-byadmin@172.41.1.2last-modified-date2012-01-12configidentifiercoredescription		-	
sip-isup-profile block-rtcp disabled hide-egress-media-update disabled last-modified-by admin@172.41.1.2 last-modified-date 2012-01-12 20:05:08 realm-config identifier Core description		1	
block-rtcp disabled hide-egress-media-update disabled last-modified-by admin@172.41.1.2 last-modified-date 2012-01-12 20:05:08 realm-config identifier Core description			
hide-egress-media-update disabled last-modified-by admin@172.41.1.2 last-modified-date 2012-01-12 20:05:08 realm-config identifier Core description			disabled
last-modified-byadmin@172.41.1.2last-modified-date2012-01-12 20:05:08realm-configidentifiercorecore		-	
last-modified-date 2012-01-12 20:05:08 realm-config identifier Core description			
realm-config identifier Core description			
identifier Core description	roolm -		2012-01-12 20.02.00
description	rearm-C	5	Corro
			COLE
		-	0 0 0 0
		aun-hieliy	0.0.0

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network-interfaces	
	M10:0
mm-in-realm	disabled
mm-in-network	enabled
mm-same-ip	enabled
mm-in-system	enabled
bw-cac-non-mm	disabled
msm-release	disabled
qos-enable	disabled
generate-UDP-checksum	disabled
max-bandwidth	0
fallback-bandwidth	0
max-priority-bandwidth	0
max-latency	0
max-jitter	0
max-packet-loss	0
observ-window-size	0
parent-realm	
dns-realm	
media-policy	
media-sec-policy	
srtp-msm-passthrough	disabled
in-translationid	
out-translationid	
in-manipulationid	
out-manipulationid	
manipulation-string	
manipulation-pattern	
class-profile	0
average-rate-limit	0
access-control-trust-level	none 0
invalid-signal-threshold maximum-signal-threshold	0
untrusted-signal-threshold	0
nat-trust-threshold	0
deny-period	30
ext-policy-svr	50
diam-e2-address-realm	
symmetric-latching	disabled
pai-strip	disabled
trunk-context	
early-media-allow	
enforcement-profile	
additional-prefixes	
restricted-latching	none
restriction-mask	32
accounting-enable	enabled
user-cac-mode	none
user-cac-bandwidth	0
user-cac-sessions	0
icmp-detect-multiplier	0
icmp-advertisement-interval	0
icmp-target-ip	
monthly-minutes	0
net-management-control	disabled
delay-media-update	disabled
refer-call-transfer	disabled
refer-notify-provisional	none
dyn-refer-term	disabled
codec-policy	dirablad
codec-manip-in-realm	disabled
constraint-name	
call-recording-server-id	xng_unknown
xnq-state	xnq-unknown

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hairpin-id	0
stun-enable	disabled
stun-server-ip	0.0.0
stun-server-port	3478
stun-changed-ip	0.0.0
stun-changed-port	3479
match-media-profiles	
gos-constraint	
sip-profile	
sip-isup-profile	
block-rtcp	disabled
hide-egress-media-update	
last-modified-by	admin@console
last-modified-date	2013-05-08 15:46:10
ession-agent	
hostname	192.168.12.200
ip-address	192.168.12.200
port	5060
state	enabled
app-protocol	SIP
app-type	
transport-method	UDP
realm-id	Core
egress-realm-id	
description	
carriers	
allow-next-hop-lp	enabled
constraints	disabled
max-sessions	0
max-inbound-sessions	0
max-outbound-sessions	0
max-burst-rate	0
max-inbound-burst-rate	0
max-outbound-burst-rate	0
max-sustain-rate	0
max-inbound-sustain-rate	e 0
max-outbound-sustain-rat	te 0
min-seizures	5
min-asr	0
time-to-resume	0
ttr-no-response	0
in-service-period	0
burst-rate-window	0
sustain-rate-window	0
req-uri-carrier-mode	None
proxy-mode	
redirect-action	
loose-routing	enabled
send-media-session	enabled
response-map	
ping-method	
ping-interval	0
ping-send-mode	keep-alive
ping-all-addresses	disabled
ping-in-service-response	
out-service-response-co	
load-balance-dns-query	hunt
media-profiles	
in-translationid	
out-translationid	
trust-me	disabled
request-uri-headers	atpapiea
stop-recurse	
local-response-map	
TOCAT-TESPONSE-IIIAP	

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	ping-to-user-part	
	ping-from-user-part	
	li-trust-me	disabled
	in-manipulationid	
	out-manipulationid	
	manipulation-string	
	manipulation-pattern	
	p-asserted-id	
	trunk-group	
	max-register-sustain-rate	0
	early-media-allow	
	invalidate-registrations	disabled
	rfc2833-mode	none
	rfc2833-payload	0
	codec-policy	
	enforcement-profile	
	refer-call-transfer	disabled
	refer-notify-provisional	none
	reuse-connections	NONE
	tcp-keepalive	none
	tcp-reconn-interval	0
	max-register-burst-rate	0
	register-burst-window	0
	sip-profile	
	sip-isup-profile	
	kpml-interworking	inherit
	last-modified-by	admin@172.41.1.2
	last-modified-date	2013-07-03 11:47:20
sip-cor	nfig	
	state	enabled
	operation-mode	dialog
	dialog-transparency	enabled
	home-realm-id	Core
	egress-realm-id	
	nat-mode	None
	registrar-domain	*
	registrar-host	*
	registrar-port	5060
	register-service-route	always
	init-timer	500
	max-timer	4000
	trans-expire	32
	invite-expire	180
	inactive-dynamic-conn	32
	enforcement-profile	
	pac-method	
	pac-interval	10
	pac-strategy	PropDist
	pac-load-weight	1
	pac-session-weight	1
	pac-route-weight	1
	pac-callid-lifetime	600
	pac-user-lifetime	3600
	red-sip-port	1988
	red-max-trans	10000
	red-sync-start-time	5000
	red-sync-comp-time	1000
	add-reason-header	disabled
		4096
	sip-message-len	
	enum-sag-match	disabled
	extra-method-stats	disabled
	rph-feature	disabled
	-	
	nsep-user-sessions-rate	0

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registration-cache	limit O
register-use-to-fo	-lp disabled
refer-src-routing	disabled
add-ucid-header	disabled
proxy-sub-events	
allow-pani-for-tru	ced-only disabled
pass-gruu-contact	disabled
sag-lookup-on-redi	ect disabled
set-disconnect-tim	-on-bye disabled
last-modified-by	admin@console
last-modified-date	2013-05-13 15:05:35
sip-interface	
state	enabled
realm-id	Access
description	
sip-port	
address	192.168.11.101
port	5060
transport-	
tls-profil	
multi-home	addrs
allow-anon	
ims-aka-pr	-
carriers	
trans-expire	0
invite-expire	0
max-redirect-conta	
proxy-mode	55 0
redirect-action	
contact-mode	none
nat-traversal	
nat-interval	none 30
	90
tcp-nat-interval	
registration-cachi	-
min-reg-expire	300
registration-inter	
route-to-registrar	enabled disabled
secured-network	
teluri-scheme	disabled
uri-fqdn-domain	- 1 1
trust-mode	all
max-nat-interval	3600
nat-int-increment	10
nat-test-increment	30
sip-dynamic-hnt	disabled
stop-recurse	401,407
port-map-start	0
port-map-end	0
in-manipulationid	
out-manipulationid	
manipulation-strin	
manipulation-patte	1
sip-ims-feature	disabled
subscribe-reg-even	disabled
operator-identifie	
anonymous-priority	none
max-incoming-conns	0
per-src-ip-max-inc	ning-conns 0
inactive-conn-time	
untrusted-conn-tim	
network-id	
ext-policy-server	
default-location-s	cing
charging-vector-mc	
	e pass

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	charging-function-address-mode	e pass
	ccf-address	
	ecf-address	
	term-tgrp-mode	none
	implicit-service-route	disabled
	rfc2833-payload	101
	rfc2833-mode	transparent
	constraint-name	
	response-map	
	local-response-map	
	ims-aka-feature	disabled
	enforcement-profile	
	route-unauthorized-calls	
	tcp-keepalive	none
	add-sdp-invite	disabled
	add-sdp-profiles	
	sip-profile	
	sip-isup-profile	
	tcp-conn-dereg	0
	register-keep-alive	none
	kpml-interworking	disabled
	tunnel-name	sipTunnel
	last-modified-by	admin@10.1.31.40
	last-modified-date	2013-05-10 12:06:29
ip-in	terface	
·L	state	enabled
	realm-id	Core
	description	
	sip-port	
	address	192.168.12.100
	port	5060
	transport-protocol	UDP
	tls-profile	021
	multi-home-addrs	
	allow-anonymous	agents-only
	ims-aka-profile	
	carriers	
	trans-expire	0
	invite-expire	0
	max-redirect-contacts	0
	proxy-mode	•
	redirect-action	
	contact-mode	none
	nat-traversal	none
	nat-interval	30
	tcp-nat-interval	90
	registration-caching	disabled
	min-reg-expire	300
	registration-interval	3600
	route-to-registrar	disabled
		disabled
	secured-network	
	teluri-scheme	disabled
	teluri-scheme uri-fqdn-domain	
	teluri-scheme uri-fqdn-domain trust-mode	all
	teluri-scheme uri-fqdn-domain trust-mode max-nat-interval	all 3600
	teluri-scheme uri-fqdn-domain trust-mode max-nat-interval nat-int-increment	all 3600 10
	teluri-scheme uri-fqdn-domain trust-mode max-nat-interval	all 3600
	teluri-scheme uri-fqdn-domain trust-mode max-nat-interval nat-int-increment	all 3600 10
	teluri-scheme uri-fqdn-domain trust-mode max-nat-interval nat-int-increment nat-test-increment	all 3600 10 30
	teluri-scheme uri-fqdn-domain trust-mode max-nat-interval nat-int-increment nat-test-increment sip-dynamic-hnt	all 3600 10 30 disabled
	teluri-scheme uri-fqdn-domain trust-mode max-nat-interval nat-int-increment nat-test-increment sip-dynamic-hnt stop-recurse	all 3600 10 30 disabled 401,407
	<pre>teluri-scheme uri-fqdn-domain trust-mode max-nat-interval nat-int-increment nat-test-increment sip-dynamic-hnt stop-recurse port-map-start port-map-end</pre>	all 3600 10 30 disabled 401,407 0
	teluri-scheme uri-fqdn-domain trust-mode max-nat-interval nat-int-increment nat-test-increment sip-dynamic-hnt stop-recurse port-map-start	all 3600 10 30 disabled 401,407 0

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	anipulation-pattern	
	ip-ims-feature	disabled
	ubscribe-reg-event perator-identifier	disabled
-	nonymous-priority	none
	ax-incoming-conns	0
	er-src-ip-max-incoming-conns	0
	nactive-conn-timeout	0
	ntrusted-conn-timeout	0
ne	etwork-id	
ez	xt-policy-server	
de	efault-location-string	
cl	harging-vector-mode	pass
cl	harging-function-address-mode	pass
CO	cf-address	
e	cf-address	
	erm-tgrp-mode	none
	mplicit-service-route	disabled
	fc2833-payload	101
	fc2833-mode	transparent
	onstraint-name	
	esponse-map	
	ocal-response-map	disabled
	ms-aka-feature	UISADIEU
	nforcement-profile oute-unauthorized-calls	
	cp-keepalive	none
	dd-sdp-invite	disabled
	dd-sdp-profiles	dibubica
	ip-profile	
	ip-isup-profile	
	cp-conn-dereg	0
	egister-keep-alive	none
kı	pml-interworking	disabled
tı	unnel-name	
la	ast-modified-by	admin@console
	ast-modified-date	2013-05-23 16:05:29
steering-p		
-	p-address	172.16.0.201
	tart-port	49152
	nd-port	65535
	ealm-id	Access
	etwork-interface	$2dm + n \otimes 172$ 41 1 2
	ast-modified-by ast-modified-date	admin@172.41.1.2
		2013-07-03 14:28:18
steering-p	pool p-address	192.168.12.100
	tart-port	49152
	nd-port	65535
	ealm-id	Core
	etwork-interface	0020
	ast-modified-by	admin@console
	ast-modified-date	2013-05-29 13:36:56
system-con		
-	ostname	
	escription	BCP Access SBC
	ocation	
m	ib-system-contact	
	ib-system-name	
	ib-system-location	
SI	nmp-enabled	enabled
ei	nable-snmp-auth-traps	disabled
ei	nable-snmp-syslog-notify nable-snmp-monitor-traps	disabled disabled

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			-
	enable-env-monitor-traps	disabled	1
	snmp-syslog-his-table-length	1	
	snmp-syslog-level	WARNING	
	system-log-level	WARNING	
	process-log-level	NOTICE	
	process-log-ip-address	0.0.0.0	
	process-log-port	0	
	collect		
	sample-interval		5
	push-interval		15
	boot-state		disabled
	start-time		now
	end-time		never
	red-collect-state		disabled
	red-max-trans		1000
	red-sync-start-time		5000
	red-sync-comp-time		1000
	push-success-trap-state		disabled
	call-trace	disabled	
	internal-trace	disabled	1
	log-filter	all	
	default-gateway	172.40.0	0.1
	restart	enabled	
	exceptions		
	telnet-timeout	0	
	console-timeout	0	
	remote-control	enabled	
	cli-audit-trail	enabled	-
	link-redundancy-state	disabled	
	source-routing	disabled	
	cli-more	disabled	l
	terminal-height	24	
	debug-timeout	0	
	trap-event-lifetime	0	
	default-v6-gateway	::	
	ipv6-signaling-mtu	1500	
	ipv4-signaling-mtu	1500	
	cleanup-time-of-day	00:00	
	snmp-engine-id-suffix		
	snmp-agent-mode	vlv2	
	comm-monitor		
	state		disabled
	qos-enable		enabled
	sbc-grp-id		0
	tls-profile		
task do	ne		
L			