

Oracle Communications Core Session
Manager – NetNumber Titan Home Subscriber
Server Interoperability Technical Application
Note

Technical Application Note



Disclaimer

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

Table of Contents

INTENDED AUDIENCE	4
DOCUMENT OVERVIEW	4
INTRODUCTION	5
ORACLE COMMUNICATIONS – NETNUMBER PARTNERSHIP	5
ORACLE COMMUNICATIONS CORE SESSION MANAGER.....	5
APPLICATION OVERVIEW	5
LAB CONFIGURATION AND SOFTWARE/HARDWARE TOOLS	6
ORACLE COMMUNICATIONS SESSION BORDER CONTROLLER SYSTEM SPECIFICATIONS.....	6
ORACLE COMMUNICATIONS CORE SESSION MANAGER SYSTEM SPECIFICATIONS	6
NET NUMBER TITAN HOME SUBSCRIBER SERVER.....	6
LAB TEST SETUP	7
PHASE 1- CONFIGURATION OF ORACLE COMMUNICATIONS CORE SESSION MANAGER	8
IN SCOPE.....	8
OUT OF SCOPE	8
WHAT YOU WILL NEED.....	8
CONFIGURING HIGHLIGHTS IN THE CSM	8
Initial Configuration – Assigning the management Interface an IP address	8
CONFIGURATION HIGHLIGHTS	9
PHASE 2 - CONFIGURATION OF NETNUMBER TITAN HOME SUBSCRIBER SERVER	11
IN SCOPE.....	11
OUT OF SCOPE	11
WHAT YOU WILL NEED.....	11
INTRODUCTION TO TITAN HSS.....	11
HOME SCREEN SHOWING HSS, SYSTEM, MANAGEMENT VIEWS	12
DEFINE CSCF PEER	12
S-CSCF URI DEFINED IN SERVER NAME	13
REALM.....	14
IMPI AND IMPU (SHOWING IMPLICIT REGISTRATION SET TIED TO THE SUBSCRIBER ID).....	15
INITIAL FILTER CRITERIA CONFIGURATION	18
TEST CASES	19
SUMMARY	20
CONCLUSIONS AND RECOMMENDATIONS	20
APPENDIX A – ORACLE SBC (P-CSCF) CONFIGURATION	21
APPENDIX – B: CSM CONFIGURATION	36



Intended Audience

This document is intended for use by Oracle Sales Consultants, Engineers, third party Systems Integrators, and end users of the Oracle Communications Core session manager product. It assumes that the reader is familiar with basic operations of the Oracle Communications Session border controller.

Document Overview

This technical application note documents the interoperability testing between Oracle Communications Core Session Manager (CSM) NetNumber TITAN Home subscriber server (HSS) products. It should be noted that while this application note focuses on the optimal configuration between Oracle Core session manager and the Titan HSS, production environments in different customer networks will have additional configuration parameters that are specific to other applications.

Introduction

Oracle Communications – NetNumber Partnership

Oracle Communications partners with NetNumber to provide highly scalable and dynamic SIP and Diameter routing solutions. The NetNumber TITAN centralized routing database compliments the powerful routing platforms of Oracle communications' next generation signaling core, IP interconnect and LTE roaming solutions. The joint solution addresses for cable, fixed-line, mobile and wholesale service providers and fulfills requirements for VoWifi, VoLTE, IMS or other SIP-based next generation networks.

Oracle Communications Core Session Manager

The Oracle Communications Core Session fully supports core session management capabilities in virtualized environments. It provides a complete set of session core functions including IP Multi-media Subsystem (IMS) Call/Session Control Functions (CSCF) and Break-out Gateway Control Function (BGCF) and their associated 3GPP interfaces. Oracle Communications Core Session Manager fully fits into existing NFV initiatives.

Oracle Communications Core Session Manager combined with Oracle Communications Session Border Controller provides a complete session management solution. Oracle Communications Core Session Manager offers a full set of 3GPP release 11 complaint functions and interfaces and is complimented by a management and support system, real-time service monitoring, and implementation services.

Application Overview

In IMS, between CSCF and HSS, Cx interface specifies a Diameter application that allows a Diameter Multimedia server and a Diameter Multimedia client to accomplish the following:

- Authorize a user to access the IMS network
- Exchange location information
- Exchange authentication information
- Download user data and filter criteria for service execution and handle changes in the user data stored in the server

The Oracle Global Partner lab was used to prototype a regular IMS, SIP Access configuration on the Oracle session border controller in role of P-CSCF, Core Session manager (I, S-CSCF) and the Net Number Home subscriber server as part of the IMS Core. The focus of this testing is to prove Interoperability between Oracle communications Core session manager (CSM) and the Net Number home subscriber server elements according to the 3gpp standards and to fully test the implementation of Cx interface.

Lab Configuration and Software/Hardware Tools

The test environment consisted of the following components:

- Oracle Communications Session Border Controller (P-CSCF)
- Oracle Communications Core session manager
- Net Number Titan Home subscriber server

The following tables provide the software hardware versions used for the elements:

Oracle Communications Session Border Controller System Specifications

Hardware	Oracle Communications Session Border Controller on 4500 platform
Software Release	S-CZ 7.2.0 MR-3 Patch 1
Software modules	SIP, Routing, External BW Mgmt, External Policy Services

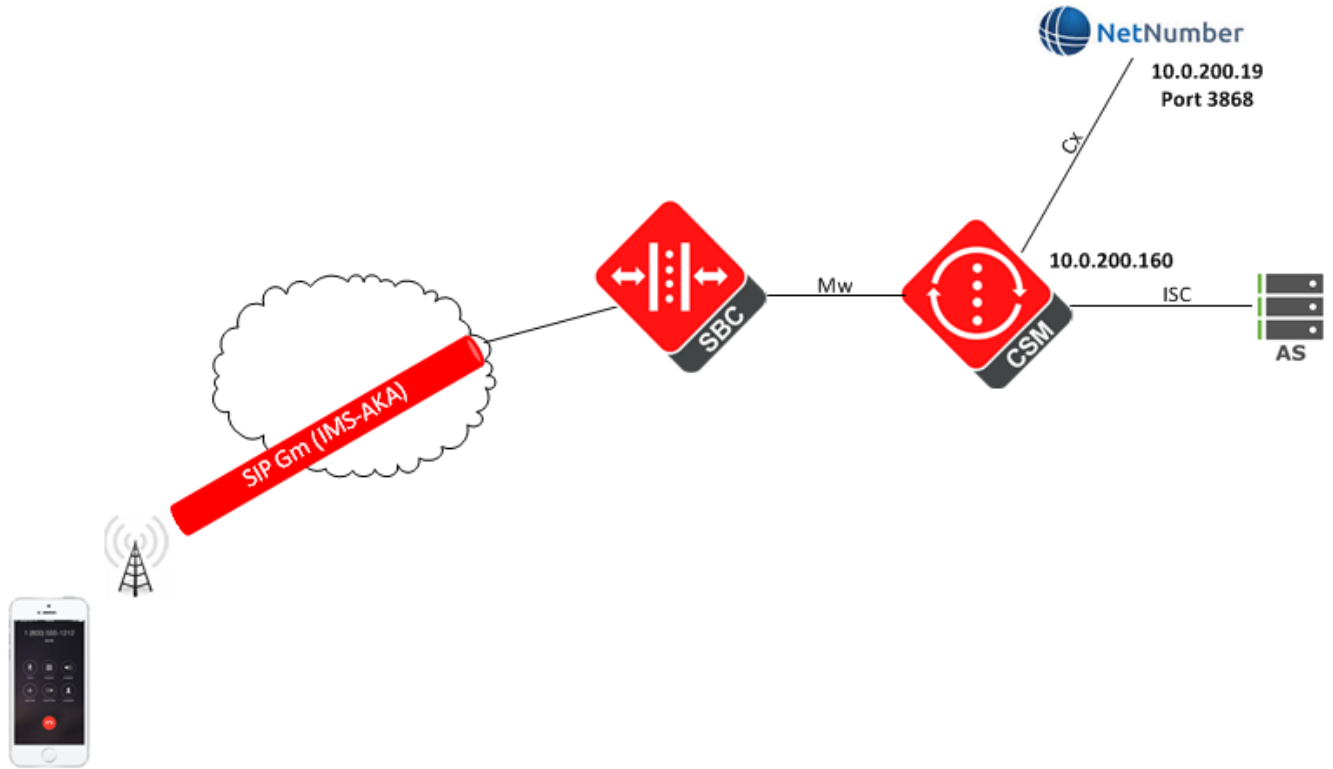
Oracle Communications Core Session Manager System Specifications

Hardware	OC-CSM on VMWare ESXi 5.1 environment
Software Release	S-CZ 7.2.5 GA
Software modules	Database registrar, external policy server, Cx

Net Number TITAN Home subscriber server

Application	Virtualized
Software Release	TITAN Edge 7.5.2-3885 – SOLO
HSS version	1.4.3-675

Lab test setup



Phase 1- Configuration of Oracle Communications Core Session Manager

In this section we describe the major steps for configuring the Core Session Manager to connect to the Titan Home subscriber server.

In Scope

This section focuses on configuration highlights in CSM to establish connection with the Titan HSS server. For detailed concepts and configuration on the CSM, please contact your Oracle representative for documentation.

Out of Scope

- Access side configuration and Network management configuration of the CSM. A full copy of the Oracle P-CSCF configuration is given in appendix section.

What you will need

- VMware ESXi vSphere client to access CSM console if required
- Terminal emulation application such as PuTTY or HyperTerm
- Passwords for the User and Superuser modes on the Oracle CSM
- IP address to be assigned to management interface of the CSM
- IP address on management subnet of Titan HSS server
- IP addresses to be used for the CSM access side (facing P-CSCF) and and Core side (towards HSS and Application server)
- IP address of the next hop gateway in the IMS core network

The Oracle CSM can be installed in a VMware environment per the instructions outlined at http://docs.oracle.com/cd/E72737_01/doc/csm_scz735_installation.pdf

Configuring Highlights in the CSM

Default CSM password is “acme” and the default super user password is “packet”.

```
Password: acme
CSM> enable
Password: packet
CSM# configure terminal
CSM(configure)#
```

You are now in the global configuration mode.

Initial Configuration – Assigning the management Interface an IP address

To assign an IP address, one has to configure the bootparams on the CSM by going to

CSM#configure terminal --- >bootparams

- Once you type “bootparam” you have to use “carriage return” key to navigate down
- A reboot is required if changes are made to the existing bootparams

```
CSM#(configure)bootparam
'.' = clear field; '-' = go to previous field; q = quit
boot device           : eth0
processor number      : 0
host name             : acmesystem
file name             : /boot/nnSCZ725.64.bz --- >location where the
```



```

software is loaded on the CSM
inet on ethernet (e)      : 172.18.255.160 --- > This is the ip address of
the management interface of the CSM
inet on backplane (b)    :
host inet (h)            :
gateway inet (g)         : 172.18.0.1 --- > gateway address here
user (u)                  : vxftp
ftp password (pw) (blank = use rsh) : vxftp
flags (f)                 :
target name (tn)         : CSM
startup script (s)       :
other (o)                 :

```

The following section walks you through configuring the Oracle Communications CSM configuration required to work with Titan HSS server.

Configuration Highlights

The CSM detailed configuration is outlined in the configuration guide at http://docs.oracle.com/cd/E58621_01/doc/csm_scz725_configuration.pdf

To establish connectivity with Titan HSS, the following steps are required:

- Define Home-subscriber-server configuration
- Configure sip-authentication
- Configure sip-registrar and reference hss config and home-server-route

Home-subscriber-server configuration

We define the HSS configuration under the configure terminal --- > session-router --- > home-subscriber-server are shown below

```

home-subscriber-server
  name                NN-HSS
  state               enabled
  transport-protocol  TCP
  address              10.0.200.19
  port                3868
  realm               coreAS
  multi-home-addr    ims.mnc820.mcc311.3gppnetwork.org
  origin-realm        CSM01.NetNumber-HSS.com
  origin-host-identifier
  watchdog-ka-timer  0
  destination-host-identifier
  num-auth-vectors   3

```

Sip-authentication-profile

Configure sip-authentication-profile for defining authentication method and applying it to SIP messages. (Configure terminal --- > session-router --- > sip-authentication-profile)

```

sip-authentication-profile
  name                AuthSIPASMode
  methods              REGISTER
  anonymous-methods
  digest-realm        ims.mnc820.mcc311.3gppnetwork.org
  credential-retrieval-method
  credential-retrieval-config

```

Define ifc-profile

Configure and define ifc-profile in the CSM to download the filter criteria from HSS for each subscriber and invoke service execution. No onboard iFC files are used therefore default and shared ifc filenames are left blank. (Configure terminal ---- > session-router --- > ifc-profile)

```
ifc-profile
  name                ASMode
  state               enabled
  default-ifc-filename
  shared-ifc-filename
  options              add-sescase-to-route
```

Sip-registrar

Configure sip-registrar and define the serving domain for the operator, home-server-route URI for communication in IMS core and reference HSS configuration. (Configure terminal --- > session-router --- > sip-registrar)

```
sip-registrar
  name                ims.mnc820.mcc311.3gppnetwork.org
  state               enabled
  domains              ims.mnc820.mcc311.3gppnetwork.org
  subscriber-database-method CX
  subscriber-database-config NN-HSS
  authentication-profile AuthSIPASMode
  home-server-route    sip:10.0.200.160:5060
  third-party-registrars
  routing-precedence   REGISTRAR
  options
  egress-realm-id      coreAS
  location-update-interval 1440
  ifc-profile           ASMode
  max-contacts-per-aor  0
  regevent-notification-profile RegEvent
  ims-core
  lb-list
```

Phase 2 - Configuration of NetNumber Titan Home subscriber Server

In this section we describe the major steps for configuring the Titan HSS to connect to the Oracle CSM and establish diameter connection.

In Scope

This section focuses on configuration highlights in Titan HSS to establish connection with the Oracle CSM. The Titan HSS was installed as a VM in a VMware ESXi environment.

Out of Scope

- Network management and Authentication Center/AKA Information (security reason)

What you will need

- VMware ESXi vSphere client to access Titan HSS console if required
- Google Chrome/Firefox/IE browser to login to the Web UI of the HSS to configure it
- Login credentials for the HSS
- IP address to be assigned to management interface of the HSS.
- IP address of the Cx based interface facing the CSM on the HSS
- Realm identifier and origin identifier to be used for capabilities exchange

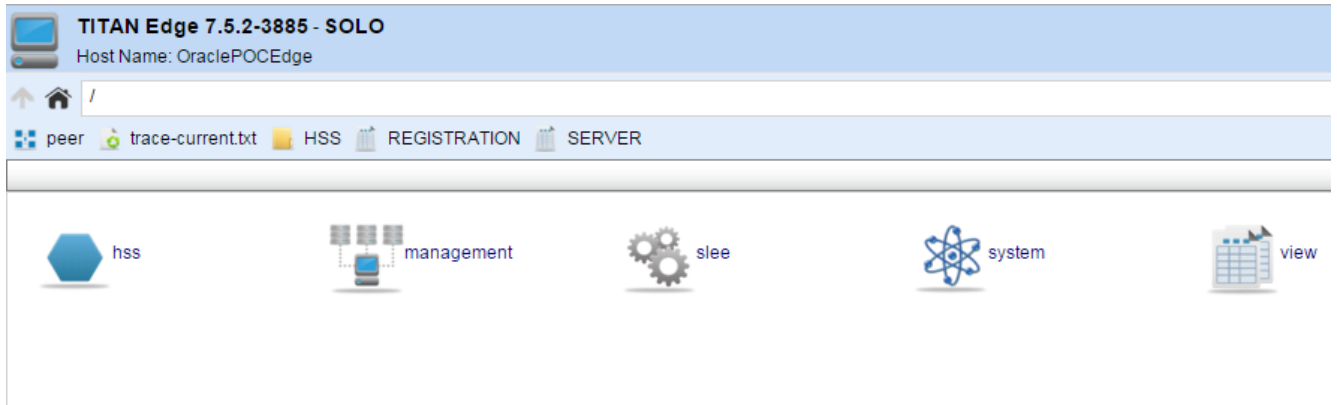
Introduction to TITAN HSS

The NetNumber HSS/AuC application is deployed in LTE EPC and IMS networks delivering subscriber profile and authentication services for fixed-line, cable, or LTE mobile access as one of several applications supported by the TITAN Centralized Signaling and Routing Control (CSRC) platform. NetNumber HSS and integrated AuC can be triggered by the I-CSCFs and S-CSCFs for user authentication procedures. The Oracle Communications Core Session Manager (OCCSM) interacts with the HSS over the Cx interface for subscriber data management.

Below are included a set of screenshots showing CSM/CSCF peer definition in HSS, IMPI/IMPU configuration, etc.

Home screen showing HSS, system, management views

Login to the HSS with a browser pointing to <http://<ipaddress>>

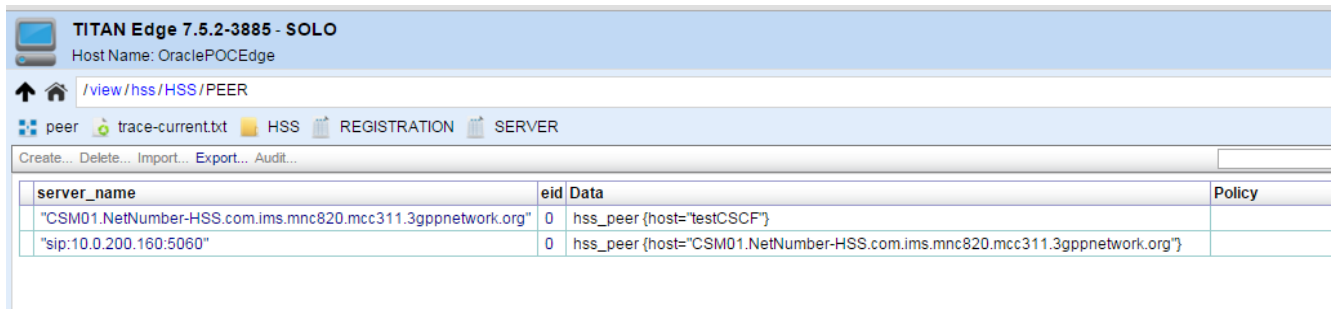


TITAN Edge 7.5.2-3885 - SOLO
Host Name: OraclePOCEdge

peer trace-current.txt HSS REGISTRATION SERVER

hss management slee system view

Define CSCF peer



TITAN Edge 7.5.2-3885 - SOLO
Host Name: OraclePOCEdge

/view/hss/HSS/PEER

peer trace-current.txt HSS REGISTRATION SERVER

Create... Delete... Import... Export... Audit...

server_name	eid	Data	Policy
"CSM01.NetNumber-HSS.com.ims.mnc820.mcc311.3gppnetwork.org"	0	hss_peer (host="testCSCF")	
"sip:10.0.200.160:5060"	0	hss_peer (host="CSM01.NetNumber-HSS.com.ims.mnc820.mcc311.3gppnetwork.org")	

S-CSCF URI defined in server name

To define the peer (CSM), maneuver to /view/hss/HSS/PEER. Click on Top right Enable link to add peer/make changes.

The screenshot displays the configuration interface for TITAN Edge 7.5.2-3885 - SOLO. The host name is OraclePOCEdge. The current view is /view/hss/HSS/PEER. The interface includes a navigation bar with links for peer, trace-current.txt, HSS, REGISTRATION, and SERVER. Below the navigation bar is a table with columns for server_name, eid, Data, and Policy. The table contains three entries:

server_name	eid	Data	Policy
"CSM01.NetNumber-HSS.com.ims.mnc820.mcc311.3gppnetwork.org"	0	hss_peer {host="testCSCF"}	
"sip:10.0.200.160:5060"	0	hss_peer {host="CSM01.NetNumber-HSS.com.ims.mnc820.mcc311.3gppnetwork.org"}	

The Properties: Entry - Edit dialog box is open, showing the Configuration tab. The configuration fields are:

- server_name: sip:10.0.200.160:5060
- eid: 0
- schema: hss_peer
- host: CSM01.NetNumber-HSS.com.ims.mnc820.mcc311.3gppnetwork.org
- policy:

There is a + show configuration schema link at the bottom of the dialog box.

Realm

The screenshot displays the configuration interface for TITAN Edge 7.5.2-3885 - SOLO. The host name is OraclePOCEdge. The current view is /view/hss/HSS/REALM. The interface includes a toolbar with icons for peer, trace-current.txt, HSS, REGISTRATION, and SERVER. Below the toolbar is a menu with options: Create..., Delete..., Import..., Export..., and Audit....

realm	Data
<input type="checkbox"/> [diam.test.com]	hss_realm {application=(cx,sh)}
<input type="checkbox"/> [ims.mnc820.mcc311.3gppnetwork.org]	hss_realm {application=(cx,sh)}

Properties: Entry - Edit [?] [X]

Save Apply Clone Disable

General Configuration

- realm: [ims.mnc820.mcc311.3gppnetwork.org]
- schema: [hss_realm]
- application: cx sh
- policy:

+ show configuration schema

IMPI and IMPU (showing implicit registration set tied to the subscriber ID)

To define the IMS identities (for the devices/subscribers), one can add private and public identities from /view/hss/HSS/IMPI and /view/hss/HSS/IMPU menu path

The screenshot shows the TITAN Edge 7.5.2-3885 - SOLO interface. The host name is OraclePOCEdge. The current view is /view/hss/HSS/IMPI. A table lists IMPI entries with columns 'nai' and 'Data'. The 'Data' column contains the value 'hss_impi {subscriber_id="311820020000001" imsi="311820020000001"}'. A 'Properties: Entry - Edit' dialog box is open, showing the configuration for an entry. The 'Configuration' tab is active, and the following fields are visible:

- nai: 311820020000006@ims.mnc820.mcc311.3gppnetwork.org
- schema: hss_impi
- subscriber_id: 311820020000006
- imsi: 311820020000006
- loose_routing: FALSE
- preferred_auth_scheme: Digest-AKAv1-MD5
- policy:

There is a '+ show configuration schema' link at the bottom of the dialog.

The screenshot shows the TITAN Edge 7.5.2-3885 - SOLO interface. The host name is OraclePOCEdge. The current view is /view/hss/HSS/IMPI_TO_IRS. A table lists IMPU entries with columns 'nai' and 'default_uri'. The 'nai' column contains values like '311820020000001@ims.mnc820.mcc311.3gppnetwork.org' and the 'default_uri' column contains values like 'sip:+12145550001@ims.mnc820.mcc311.3gppnetwork.org'. A 'Properties: Entry - Edit' dialog box is open, showing the configuration for an entry. The 'Configuration' tab is active, and the following fields are visible:

- nai: 311820020000006@ims.mnc820.mcc311.3gppnetwork.org
- default_uri: sip:+12145550006@ims.mnc820.mcc311.3gppnetwork.org
- schema: hss_impi_to_irs
- policy:

There is a '+ show configuration schema' link at the bottom of the dialog.



TITAN Edge 7.5.2-3885 - SOLO

Host Name: OraclePOCEdge



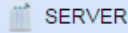
/view/hss/HSS/IMPU



peer trace-current.txt



HSS REGISTRATION



SERVER

Create... Delete... Import... Export... Audit...

<input type="checkbox"/>	dn	Data
<input type="checkbox"/>	'12145550001'	hss all
<input type="checkbox"/>	'12145550002'	hss all
<input type="checkbox"/>	'12145550003'	hss all
<input type="checkbox"/>	'12145550004'	hss all
<input type="checkbox"/>	'12145550005'	hss all
<input type="checkbox"/>	'12145550006'	hss all
<input type="checkbox"/>	'12145550007'	hss all
<input type="checkbox"/>	'12145550008'	hss all
<input type="checkbox"/>	'12145550009'	hss all
<input type="checkbox"/>	'12145550010'	hss all

Properties: Entry - Edit ? X

Save Apply Clone Disable

General **Configuration**

- dn:
- schema:
- subscriber_id:
- has_tel_uri_alias:
- match_tel_uri:
- allow_unregistered_services:
- blocked:
- roaming_profile:
- service_name:
- policy:

[+ show configuration schema](#)

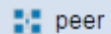


TITAN Edge 7.5.2-3885 - SOLO

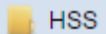
Host Name: OraclePOCEdge



/view/hss/HSS/IRS_TO_IMPU



trace-current.txt



REGISTRATION

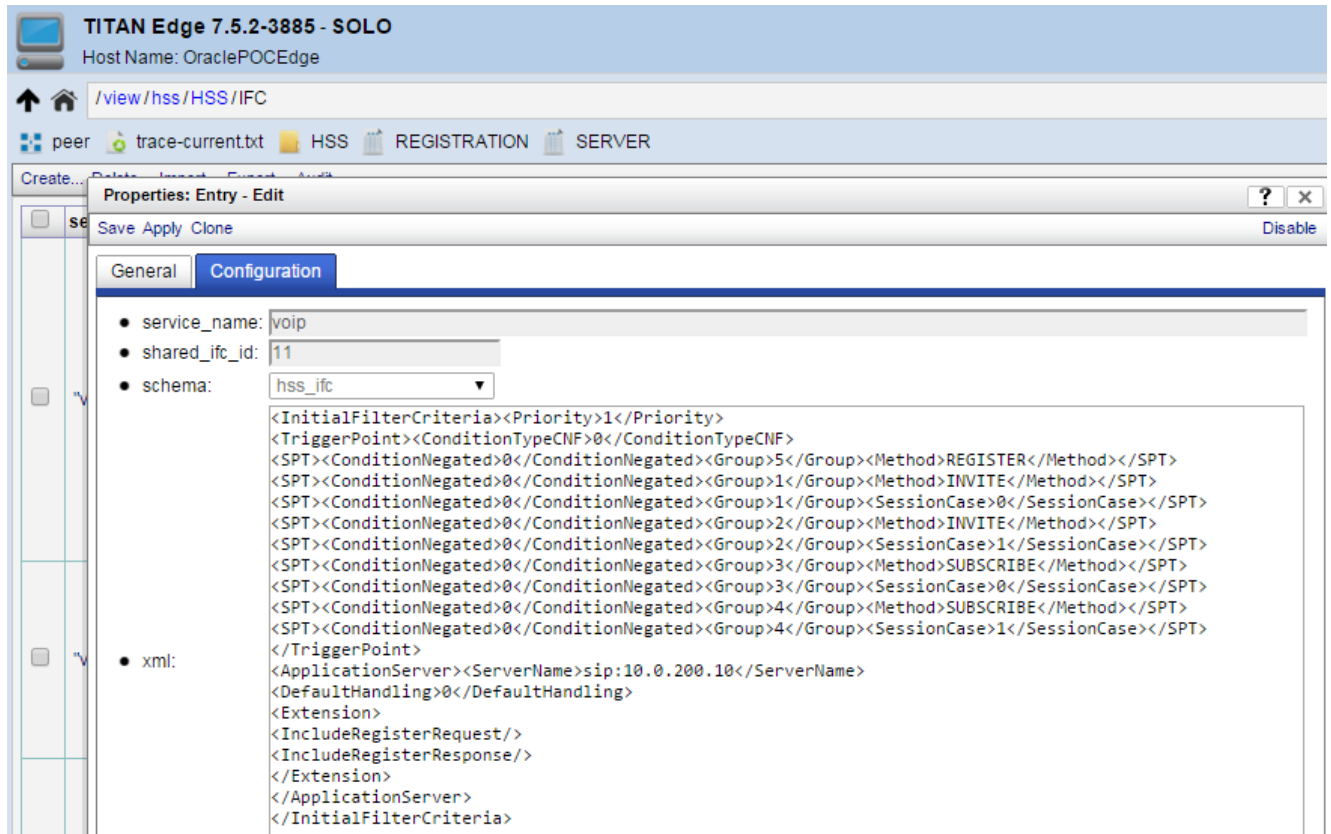
SERVER

Create... Delete... Import... Export... Audit...

<input type="checkbox"/>	default uri	uri
<input type="checkbox"/>	"sip:	Properties: Entry - Edit
<input type="checkbox"/>	"sip:	Save Apply Clone
<input type="checkbox"/>	"sip:	Disable
<input type="checkbox"/>	"sip:	General
<input type="checkbox"/>	"sip:	Configuration
<input type="checkbox"/>	"sip:	• default_uri: sip:+12145550006@ims.mnc820.mcc311.3gppnetwork.org
<input type="checkbox"/>	"sip:	• uri: sip:+12145550006@ims.mnc820.mcc311.3gppnetwork.org
<input type="checkbox"/>	"sip:	• schema: hss_irs_to_impv
<input type="checkbox"/>	"sip:	<input checked="" type="checkbox"/> policy:
<input type="checkbox"/>	"sip:	<input checked="" type="checkbox"/> priority: 1
<input type="checkbox"/>	"sip:	<input type="checkbox"/> weight:
<input type="checkbox"/>	"sip:	<input type="checkbox"/> effective:
<input type="checkbox"/>	"sip:	<input type="checkbox"/> dow: <input type="checkbox"/> SUN <input type="checkbox"/> MON <input type="checkbox"/> TUE <input type="checkbox"/> WED <input type="checkbox"/> THU <input type="checkbox"/> FRI <input type="checkbox"/> SAT
<input type="checkbox"/>	"sip:	<input type="checkbox"/> tod:
<input type="checkbox"/>	"sip:	<input type="checkbox"/> timezone: UTC
<input type="checkbox"/>	"sip:	+ show configuration schema

Initial Filter Criteria configuration

Configure filter criteria information in the HSS and invoke service execution by referencing Application server from /view/hss/HSS/IFC menu path



The screenshot displays the configuration interface for TITAN Edge 7.5.2-3885 - SOLO. The host name is OraclePOCEdge. The browser address bar shows /view/hss/HSS/IFC. The interface includes a breadcrumb trail: peer > trace-current.txt > HSS > REGISTRATION > SERVER. A 'Properties: Entry - Edit' dialog box is open, showing the 'Configuration' tab. The configuration fields are:

- service_name: voip
- shared_ifc_id: 11
- schema: hss_ifc

The XML configuration for the Initial Filter Criteria is as follows:

```
<InitialFilterCriteria><Priority>1</Priority>
<TriggerPoint><ConditionTypeCNF>0</ConditionTypeCNF>
<SPT><ConditionNegated>0</ConditionNegated><Group>5</Group><Method>REGISTER</Method></SPT>
<SPT><ConditionNegated>0</ConditionNegated><Group>1</Group><Method>INVITE</Method></SPT>
<SPT><ConditionNegated>0</ConditionNegated><Group>1</Group><SessionCase>0</SessionCase></SPT>
<SPT><ConditionNegated>0</ConditionNegated><Group>2</Group><Method>INVITE</Method></SPT>
<SPT><ConditionNegated>0</ConditionNegated><Group>2</Group><SessionCase>1</SessionCase></SPT>
<SPT><ConditionNegated>0</ConditionNegated><Group>3</Group><Method>SUBSCRIBE</Method></SPT>
<SPT><ConditionNegated>0</ConditionNegated><Group>3</Group><SessionCase>0</SessionCase></SPT>
<SPT><ConditionNegated>0</ConditionNegated><Group>4</Group><Method>SUBSCRIBE</Method></SPT>
<SPT><ConditionNegated>0</ConditionNegated><Group>4</Group><SessionCase>1</SessionCase></SPT>
</TriggerPoint>
<ApplicationServer><ServerName>sip:10.0.200.10</ServerName>
<DefaultHandling>0</DefaultHandling>
<Extension>
<IncludeRegisterRequest/>
<IncludeRegisterResponse/>
</Extension>
</ApplicationServer>
</InitialFilterCriteria>
```

To view entire HSS configuration and export/download as a text file, one can use the /system/configuration menu path

Test Cases

The purpose of this testing was to verify the correct implementation of Cx interface between Oracle CSM and Net Number HSS.

The following main areas were covered during IOT:

- Diameter Cx connection between CSM's S-CSCF function and HSS
- IMS subscriber registration, location information update in HSS, download of user profile and filter criteria
- IMS subscriber de registration, invalid users rejected, administrative de-registration

Test Plan

#	Scenario	Test Case Description	Result
1	Diameter peer establishment: HSS connects to S-CSCF (CSM)	HSS initiates Diameter CER to the S-CSCF (Oracle CSM)	Pass
2	Diameter peer establishment: S-CSCF connects to HSS	Oracle CSM initiates Diameter CER/CEA to HSS	Pass
3	Successful IMS registration	Authenticate and register the IMPI/IMPU of the UE on network	Pass
4	Successful IMS re-registration	Re-Register the IMPI/IMPU of the UE on the network	Pass
5	Successful IMS De-Registration	De-Register the IMPI/IMPU from the network using the UE	Pass
6	HSS initiated De-registration	De-register the IMPI/IMPU of the UE on network administratively from the HSS	Pass
7	iFC Configuration Application Server	Validate initial filter criteria data associated with the IMPI/IMPU configuration of the UE on network from the HSS. IFC contains Application Server information	Pass
8	Initial Filter Criteria Multiple iFC/Trigger Points	Validate initial filter criteria data associated with the IMPI/IMPU configuration of the UE on network from the HSS. IFC contains Application Server information and multiple IFC attachments including trigger points with CNF/DNF	Pass
9	CNSA with Subscribed Media Profile ID	Validate CNSA associated with the IMPI/IMPU configuration of the UE on network from the HSS. CNSA contains Subscribed Media Profile Id information and if applicable Service Identifier	Pass
10	Location Information Request	Validate Location Information Request when an IMPI has registered and unregistered IMPU values	Pass
11	Implicit IMPU Set for IMPI	Validate implicit IMPU settings on a per IMPI configuration	Pass
12	IMPI/IMPU failure scenario	Validate that HSS will send Diameter error when IMPI/IMPU is not configured	Pass
13	IMS Subscription invalid	Validate the HSS will send Diameter error for IMS service information invalid to a configured IMPI/IMPU set	Pass

Summary

This section provides a statistical summary of the testing.

No. of Cx Test Cases	Pass	Fail	N/S, N/T
13	13	0	0

Conclusions and Recommendations

The interoperability testing between Oracle Core session manager and NetNumber Titan HSS was conducted successfully demonstrating Cx interface capabilities of both elements in an IMS network. Both network elements conform to the Cx interface specification as defined in 3gpp specification TS 29.228

Push-Profile-Update/Response use case was not tested as TITAN HSS currently supports this capability only when SIP Digest based authentication is used. In the current IOT, IMS-AKA (digest-akav1-md5) was used.

Appendix A – Oracle SBC (P-CSCF) Configuration

```
Oracle-PCSCF# show running-config
capture-receiver
  state enabled
  address 10.0.200.200
  network-interface slp0:0
  last-modified-by admin@172.18.0.145
  last-modified-date 2015-08-20 19:41:42
codec-policy
  name RemoveAMRWB
  allow-codecs AMR-WB:no *
  add-codecs-on-egress
  order-codecs
  force-ptime disabled
  packetization-time 20
  dtmf-in-audio disabled
  last-modified-by admin@172.18.0.177
  last-modified-date 2015-09-09 18:04:50
host-route
  dest-network 192.168.1.0
  netmask 255.255.255.0
  gateway 192.168.1.1
  description
  last-modified-by admin@172.18.0.171
  last-modified-date 2015-07-14 20:46:15
ims-aka-profile
  name VoLTE
  start-protected-client-port 7000
  end-protected-client-port 7004
  protected-server-port 8000
  auth-alg-list hmac-sha-1-96 hmac-md5-96
  encr-alg-list null
  options
  last-modified-by admin@172.18.0.160
  last-modified-date 2015-07-07 18:51:53
ipsec-global-config
  red-ipsec-port 0
  red-max-trans 10000
  red-sync-start-time 5000
  red-sync-comp-time 1000
  options
  last-modified-by admin@148.87.66.54
  last-modified-date 2015-03-11 19:38:26
local-policy
  from-address *
  to-address *
  source-realm access
  description
  activate-time
  deactivate-time
  state enabled
  policy-priority none
  policy-attribute
    next-hop 10.0.200.161
    realm core
    action none
    terminate-recursion disabled
    carrier
    start-time 0000
    end-time 2400
    days-of-week U-S
    cost 0
    state enabled
  app-protocol
  methods
  media-profiles
```

```

        lookup                               single
        next-key
        eloc-str-lkup                         disabled
        eloc-str-match
        last-modified-by                     admin@172.18.0.158
        last-modified-date                   2015-11-11 18:48:42
media-manager
    state                                   enabled
    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                               enabled
    algd-log-level                          NOTICE
    mbcd-log-level                          DEBUG
    options
    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                 10000000
    max-untrusted-signaling                 100
    min-untrusted-signaling                 30
    app-signaling-bandwidth                 0
    tolerance-window                       30
    trap-on-demote-to-deny                  disabled
    trap-on-demote-to-untrusted              disabled
    syslog-on-demote-to-deny                 disabled
    syslog-on-demote-to-untrusted            disabled
    rtcp-rate-limit                         0
    anonymous-sdp                            disabled
    arp-msg-bandwidth                       32000
    fragment-msg-bandwidth                  0
    rfc2833-timestamp                       disabled
    default-2833-duration                   100
    rfc2833-end-pkts-only-for-non-sig       enabled
    translate-non-rfc2833-event             disabled
    media-supervision-traps                  disabled
    dnsalg-server-failover                  disabled
    syslog-on-call-reject                    disabled
    last-modified-by                       admin@172.18.0.115
    last-modified-date                      2015-09-17 18:02:04
network-interface
    name                                    s0p0
    sub-port-id                             0
    description
    hostname
    ip-address                              192.168.1.105
    pri-utility-addr
    sec-utility-addr
    netmask                                 255.255.255.0
    gateway                                 192.168.1.120
    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
signaling-mtu 0
hip-ip-list 192.168.1.105
ftp-address
icmp-address 192.168.1.105
snmp-address
telnet-address
ssh-address 192.168.1.105
last-modified-by admin@172.18.0.118
last-modified-date 2015-07-23 18:52:43
network-interface
name slp0
sub-port-id 0
description
hostname
ip-address 10.0.200.163
pri-utility-addr
sec-utility-addr
netmask 255.255.255.0
gateway 10.0.200.1
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
signaling-mtu 0
hip-ip-list 10.0.200.163
ftp-address
icmp-address 10.0.200.163
snmp-address
telnet-address
ssh-address 10.0.200.163
last-modified-by admin@172.18.0.119
last-modified-date 2015-03-13 20:13:59
phy-interface
name s0p0
operation-type Media
port 0
slot 0
virtual-mac
admin-state enabled
auto-negotiation enabled
duplex-mode FULL
speed 100
wancom-health-score 50
overload-protection disabled
mac-filtering disabled
last-modified-by admin@172.19.161.49
last-modified-date 2014-11-12 16:21:40
phy-interface
name s0p1
operation-type Media
port 1
slot 0
virtual-mac
admin-state enabled
auto-negotiation enabled
duplex-mode FULL

```

```

speed 100
wancom-health-score 50
overload-protection disabled
mac-filtering disabled
last-modified-by admin@172.19.161.49
last-modified-date 2014-12-24 19:12:45
phy-interface
  name slp0
  operation-type Media
  port 0
  slot 1
  virtual-mac
  admin-state enabled
  auto-negotiation enabled
  duplex-mode FULL
  speed 100
  wancom-health-score 50
  overload-protection disabled
  mac-filtering disabled
  last-modified-by admin@155.212.214.199
  last-modified-date 2014-11-20 17:09:41
realm-config
  identifier access
  description
  addr-prefix 0.0.0.0
  network-interfaces s0p0:0
  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
  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
  class-profile
  in-translationid
  out-translationid
  in-manipulationid
  out-manipulationid
  average-rate-limit 0
  access-control-trust-level none
  invalid-signal-threshold 0
  maximum-signal-threshold 0
  untrusted-signal-threshold 0
  nat-trust-threshold 0
  max-endpoints-per-nat 0
  nat-invalid-message-threshold 0
  wait-time-for-invalid-register 0
  deny-period 30
  cac-failure-threshold 0
  untrust-cac-failure-threshold 0
  ext-policy-svr
  diam-e2-address-realm
  subscription-id-type END_USER_NONE
  symmetric-latching disabled
  pai-strip disabled

```



```

trunk-context
early-media-allow
enforcement-profile
additional-prefixes
restricted-latching                none
restriction-mask                    32
user-cac-mode                       none
user-cac-bandwidth                  0
user-cac-sessions                   0
icmp-detect-multiplier              0
icmp-advertisement-interval         0
icmp-target-ip                      0
monthly-minutes                     0
options
accounting-enable                   enabled
net-management-control              disabled
delay-media-update                  disabled
refer-call-transfer                 disabled
refer-notify-provisional            none
dyn-refer-term                      disabled
codec-policy
codec-manip-in-realm                disabled
codec-manip-in-network              enabled
rtcp-policy
constraint-name
call-recording-server-id
session-recording-server
session-recording-required          disabled
manipulation-string
manipulation-pattern
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
sip-profile
sip-isup-profile
match-media-profiles
qos-constraint
block-rtcp                          disabled
hide-egress-media-update             disabled
tcp-media-profile
monitoring-filters
node-functionality
default-location-string
alt-family-realm
pref-addr-type                      none
last-modified-by                    admin@172.18.0.115
last-modified-date                  2015-09-17 18:01:36
realm-config
identifier                          core
description
addr-prefix                          0.0.0.0
network-interfaces                  sip0:0
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
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
class-profile	
in-translationid	
out-translationid	
in-manipulationid	
out-manipulationid	
average-rate-limit	0
access-control-trust-level	none
invalid-signal-threshold	0
maximum-signal-threshold	0
untrusted-signal-threshold	0
nat-trust-threshold	0
max-endpoints-per-nat	0
nat-invalid-message-threshold	0
wait-time-for-invalid-register	0
deny-period	30
cac-failure-threshold	0
untrust-cac-failure-threshold	0
ext-policy-svr	
diam-e2-address-realm	
subscription-id-type	END_USER_NONE
symmetric-latching	disabled
pai-strip	disabled
trunk-context	
early-media-allow	
enforcement-profile	
additional-prefixes	
restricted-latching	none
restriction-mask	32
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
options	
accounting-enable	enabled
net-management-control	disabled
delay-media-update	disabled
refer-call-transfer	disabled
refer-notify-provisional	none
dyn-refer-term	disabled
codec-policy	
codec-manip-in-realm	disabled
codec-manip-in-network	enabled
rtcp-policy	
constraint-name	
call-recording-server-id	
session-recording-server	
session-recording-required	disabled
manipulation-string	
manipulation-pattern	
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
sip-profile	
sip-isup-profile	
match-media-profiles	
qos-constraint	

```

block-rtcp disabled
hide-egress-media-update disabled
tcp-media-profile
monitoring-filters
node-functionality
default-location-string
alt-family-realm
pref-addr-type none
last-modified-by admin@172.18.0.119
last-modified-date 2015-03-13 20:14:29
security-policy
name WiFiIMSAKA
network-interface s0p0:0
priority 10
local-ip-addr-match 192.168.1.105
remote-ip-addr-match 0.0.0.0
local-port-match 0
remote-port-match 0
trans-protocol-match ALL
direction both
local-ip-mask 255.255.255.255
remote-ip-mask 0.0.0.0
action ipsec
outbound-sa-fine-grained-mask
local-ip-mask 255.255.255.255
remote-ip-mask 255.255.255.255
local-port-mask 65535
remote-port-mask 65535
trans-protocol-mask 0
valid enabled
vlan-mask 0xFFFF
ike-sainfo-name
last-modified-by admin@172.18.0.145
last-modified-date 2015-07-22 16:35:51
security-policy
name WiFiSIP
network-interface s0p0:0
priority 0
local-ip-addr-match 192.168.1.105
remote-ip-addr-match 0.0.0.0
local-port-match 5060
remote-port-match 0
trans-protocol-match ALL
direction both
local-ip-mask 255.255.255.255
remote-ip-mask 0.0.0.0
action allow
outbound-sa-fine-grained-mask
local-ip-mask 255.255.255.255
remote-ip-mask 255.255.255.255
local-port-mask 65535
remote-port-mask 65535
trans-protocol-mask 0
valid enabled
vlan-mask 0xFFFF
ike-sainfo-name
last-modified-by admin@172.18.0.145
last-modified-date 2015-07-22 16:35:58
session-agent
hostname 10.0.200.161
ip-address 10.0.200.161
port 5060
state enabled
app-protocol SIP
app-type
transport-method UDP
realm-id core

```

egress-realm-id	
description	CSM
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	0
max-outbound-sustain-rate	0
min-seizures	5
min-asr	0
cac-trap-threshold	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-codes	
out-service-response-codes	
load-balance-dns-query	hunt
options	
media-profiles	
in-translationid	
out-translationid	
trust-me	enabled
request-uri-headers	
stop-recurse	
local-response-map	
ping-to-user-part	
ping-from-user-part	
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
monitoring-filters
session-recording-server
session-recording-required       disabled
last-modified-by                 admin@172.18.0.119
last-modified-date               2015-03-13 20:20:35
session-agent
hostname                          10.0.200.164
ip-address                        10.0.200.164
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         0
max-outbound-sustain-rate        0
min-seizures                     5
min-asr                           0
cac-trap-threshold               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                       OPTIONS;hops=0
ping-interval                     10
ping-send-mode                    keep-alive
ping-all-addresses               disabled
ping-in-service-response-codes
out-service-response-codes
load-balance-dns-query           hunt
options
media-profiles
in-translationid
out-translationid
trust-me                          disabled
request-uri-headers
stop-recurse
local-response-map
ping-to-user-part
ping-from-user-part
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
monitoring-filters
session-recording-server
session-recording-required               disabled
last-modified-by                         admin@172.18.0.119
last-modified-date                       2015-10-21 20:04:54
session-group
group-name                               route-to-csm
description
state                                    enabled
app-protocol                             SIP
strategy                                  Hunt
dest                                      10.0.200.164
                                          10.0.200.161

trunk-group
sag-recursion                            disabled
stop-sag-recurse                         401,407
last-modified-by                         admin@172.18.0.119
last-modified-date                       2015-10-21 17:27:03
sip-config
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
initial-inv-trans-expire                   0
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
options                                   force-unregistration
                                          max-udp-length=0
add-reason-header                         disabled

```

sip-message-len	4096
enum-sag-match	disabled
extra-method-stats	disabled
extra-enum-stats	disabled
registration-cache-limit	0
register-use-to-for-lp	disabled
refer-src-routing	disabled
add-ucid-header	disabled
proxy-sub-events	
allow-pani-for-trusted-only	disabled
atcf-stn-sr	
atcf-psi-dn	
atcf-route-to-sccas	disabled
eatf-stn-sr	
pass-gruu-contact	disabled
sag-lookup-on-redirect	disabled
set-disconnect-time-on-bye	disabled
msrp-delayed-bye-timer	15
transcoding-realm	
transcoding-agents	
create-dynamic-sa	disabled
node-functionality	P-CSCF
match-sip-instance	disabled
sa-routes-stats	disabled
sa-routes-traps	disabled
rx-sip-reason-mapping	disabled
add-ue-location-in-pani	disabled
hold-emergency-calls-for-loc-info	0
last-modified-by	admin@172.18.0.160
last-modified-date	2015-07-07 19:00:12
sip-feature	
name	sec-agree
realm	
support-mode-inbound	Pass
require-mode-inbound	Pass
proxy-require-mode-inbound	Pass
support-mode-outbound	Pass
require-mode-outbound	Pass
proxy-require-mode-outbound	Pass
last-modified-by	admin@172.18.0.160
last-modified-date	2015-07-07 19:00:28
sip-interface	
state	enabled
realm-id	access
description	
sip-port	
address	192.168.1.105
port	5060
transport-protocol	UDP
tls-profile	
allow-anonymous	registered
multi-home-addr	
ims-aka-profile	VoLTE
sip-port	
address	192.168.1.105
port	5060
transport-protocol	TCP
tls-profile	
allow-anonymous	registered
multi-home-addr	
ims-aka-profile	
carriers	
trans-expire	0
initial-inv-trans-expire	0
invite-expire	0
max-redirect-contacts	0
proxy-mode	

redirect-action	
contact-mode	none
nat-traversal	always
nat-interval	30
tcp-nat-interval	90
registration-caching	enabled
min-reg-expire	300
registration-interval	1800
route-to-registrar	enabled
secured-network	disabled
teluri-scheme	disabled
uri-fqdn-domain	
options	
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	
sip-ims-feature	enabled
sip-atcf-feature	disabled
subscribe-reg-event	disabled
operator-identifier	
anonymous-priority	none
max-incoming-conns	0
per-src-ip-max-incoming-conns	0
inactive-conn-timeout	0
untrusted-conn-timeout	0
network-id	ims.mnc820.mcc311.3gppnetwork.org
ext-policy-server	
default-location-string	
term-tgrp-mode	none
charging-vector-mode	pass
charging-function-address-mode	pass
ccf-address	
ecf-address	
implicit-service-route	disabled
rfc2833-payload	101
rfc2833-mode	transparent
constraint-name	
response-map	
local-response-map	
sec-agree-feature	enabled
sec-agree-pref	ipsec3gpp
enforcement-profile	
route-unauthorized-calls	
tcp-keepalive	none
add-sdp-invite	disabled
p-early-media-header	disabled
p-early-media-direction	
add-sdp-profiles	
manipulation-string	
manipulation-pattern	
sip-profile	
sip-isup-profile	
tcp-conn-dereg	0
tunnel-name	
register-keep-alive	none
kpml-interworking	disabled
msrp-delay-egress-bye	disabled
send-380-response	
pcscf-restoration	
session-timer-profile	


```

response-map
local-response-map
sec-agree-feature          disabled
sec-agree-pref             ipsec3gpp
enforcement-profile
route-unauthorized-calls
tcp-keepalive              none
add-sdp-invite             disabled
p-early-media-header       disabled
p-early-media-direction
add-sdp-profiles
manipulation-string
manipulation-pattern
sip-profile
sip-isup-profile
tcp-conn-dereg             0
tunnel-name
register-keep-alive        none
kpml-interworking          disabled
msrp-delay-egress-by      disabled
send-380-response
pcscf-restoration
session-timer-profile
session-recording-server
session-recording-required disabled
reg-cache-route           disabled
steering-pool
  ip-address                10.0.200.163
  start-port                10500
  end-port                  20000
  realm-id                  core
  network-interface
  last-modified-by         admin@172.18.0.119
  last-modified-date       2015-03-13 20:14:52
steering-pool
  ip-address                192.168.1.110
  start-port                10000
  end-port                  10500
  realm-id                  access
  network-interface
  last-modified-by         admin@172.18.0.119
  last-modified-date       2015-07-31 18:23:51
system-config
  hostname                  A-SBC
  description
  location
  mib-system-contact
  mib-system-name
  mib-system-location
  snmp-enabled              enabled
  enable-snmp-auth-traps    disabled
  enable-snmp-syslog-notify disabled
  enable-snmp-monitor-traps disabled
  enable-env-monitor-traps  disabled
  snmp-syslog-his-table-length 1
  snmp-syslog-level         WARNING
  system-log-level          WARNING
  process-log-level         DEBUG
  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
comm-monitor
state enabled
sbc-grp-id 5
tls-profile
qos-enable enabled
monitor-collector
address 10.0.200.25
port 4739
network-interface slp0:0
monitor-collector
address 172.18.255.50
port 4739
network-interface wancom0:0
monitor-collector
address 192.168.1.130
port 4739
network-interface s0p0:0

call-trace disabled
internal-trace disabled
log-filter all
default-gateway 172.18.0.1
restart enabled
exceptions
telnet-timeout 0
console-timeout 0
remote-control enabled
cli-audit-trail enabled
link-redundancy-state disabled
source-routing enabled
cli-more disabled
terminal-height 24
debug-timeout 0
trap-event-lifetime 0
ids-syslog-facility -1
options
default-v6-gateway ::
ipv6-signaling-mtu 1500
ipv4-signaling-mtu 1500
cleanup-time-of-day 00:00
snmp-engine-id-suffix
snmp-agent-mode v1v2
last-modified-by admin@172.18.255.61
last-modified-date 2016-02-18 20:24:41
web-server-config
state enabled
inactivity-timeout 5
http-state enabled
http-port 80
https-state disabled
https-port 443
tls-profile

```

Appendix – B: CSM Configuration

```
Oracle-CSM# show running-config
home-subscriber-server
  name                          FHoSSASMode
  state                          enabled
  transport-protocol             TCP
  address                        10.0.200.18
  port                           3868
  realm                          coreAS
  multi-home-addr
  origin-realm                   ims.mnc820.mcc311.3gppnetwork.org
  origin-host-identifier        CSM01
  watchdog-ka-timer             0
  destination-host-identifier
  num-auth-vectors              1
  last-modified-by              admin@172.18.0.119
  last-modified-date            2015-03-30 18:28:37
home-subscriber-server
  name                          NN-HSS
  state                          enabled
  transport-protocol             TCP
  address                        10.0.200.19
  port                           3868
  realm                          coreAS
  multi-home-addr
  origin-realm                   ims.mnc820.mcc311.3gppnetwork.org
  origin-host-identifier        CSM01.NetNumber-HSS.com
  watchdog-ka-timer             0
  destination-host-identifier
  num-auth-vectors              3
  last-modified-by              admin@172.18.0.140
  last-modified-date            2015-04-27 16:03:20
ifc-profile
  name                          ASMode
  state                          enabled
  default-ifc-filename
  shared-ifc-filename
  options                        add-sescase-to-route
  last-modified-by              admin@172.18.0.119
  last-modified-date            2014-11-21 16:24:13
network-interface
  name                          M10
  sub-port-id                    0
  description
  hostname
  ip-address                     10.0.200.160
  pri-utility-addr
  sec-utility-addr
  netmask                       255.255.0.0
  gateway                        10.0.200.1
  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
  signaling-mtu                  0
  hip-ip-list                    10.0.200.160
                                10.0.200.161
                                10.0.200.162
```

```

ftp-address
icmp-address          10.0.200.160
                     10.0.200.161
                     10.0.200.162

snmp-address
telnet-address
ssh-address
last-modified-by     admin@172.18.0.141
last-modified-date   2015-10-27 18:19:26
phy-interface
name                 M10
operation-type       Media
port                 0
slot                 1
virtual-mac
admin-state          enabled
auto-negotiation     enabled
duplex-mode          FULL
speed                100
wancom-health-score  50
last-modified-by     admin@172.18.0.119
last-modified-date   2014-11-21 16:24:13
realm-config
identifier            accessAS
description
addr-prefix           0.0.0.0
network-interfaces    M10:0
max-latency           0
max-jitter            0
max-packet-loss       0
observ-window-size    0
parent-realm
dns-realm
in-translationid
out-translationid
in-manipulationid
out-manipulationid
average-rate-limit    0
access-control-trust-level none
invalid-signal-threshold 0
maximum-signal-threshold 0
untrusted-signal-threshold 0
wait-time-for-invalid-register 0
deny-period           30
options
accounting-enable     enabled
constraint-name
manipulation-string
manipulation-pattern
alt-family-realm
pref-addr-type        none
last-modified-by     admin@172.18.0.119
last-modified-date   2014-12-08 16:49:54
realm-config
identifier            coreAS
description
addr-prefix           0.0.0.0
network-interfaces    M10:0
max-latency           0
max-jitter            0
max-packet-loss       0
observ-window-size    0
parent-realm
dns-realm
in-translationid
out-translationid
in-manipulationid

```

```

out-manipulationid
average-rate-limit 0
access-control-trust-level none
invalid-signal-threshold 0
maximum-signal-threshold 0
untrusted-signal-threshold 0
wait-time-for-invalid-register 0
deny-period 30
options
accounting-enable enabled
constraint-name
manipulation-string
manipulation-pattern
alt-family-realm
pref-addr-type none
last-modified-by admin@172.18.0.119
last-modified-date 2014-11-21 16:24:13
regevent-notification-profile
name RegEvent
min-subscription-duration 600000
options notify-refreshinterval=1800
last-modified-by admin@172.18.0.119
last-modified-date 2014-11-21 16:24:13
session-agent
hostname 10.0.200.10
ip-address 10.0.200.10
port 5060
state enabled
app-protocol SIP
app-type
transport-method UDP
realm-id coreAS
egress-realm-id
description
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 0
max-outbound-sustain-rate 0
min-seizures 5
min-asr 0
cac-trap-threshold 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-codes
out-service-response-codes
load-balance-dns-query hunt
options

```

```

in-translationid
out-translationid
trust-me                               enabled
request-uri-headers
stop-recurse
local-response-map
ping-to-user-part
ping-from-user-part
in-manipulationid
out-manipulationid
manipulation-string
manipulation-pattern
p-asserted-id
max-register-sustain-rate              0
reuse-connections                      NONE
tcp-keepalive                          none
tcp-reconn-interval                   0
max-register-burst-rate                0
register-burst-window                  0
last-modified-by                       admin@172.18.0.119
last-modified-date                     2014-12-08 17:09:10
session-agent
hostname                               ns-sig.pe.lab
ip-address                             10.0.200.11
port                                   5060
state                                  enabled
app-protocol                           SIP
app-type
transport-method                       UDP
realm-id                               coreAS
egress-realm-id
description
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               0
max-outbound-sustain-rate              0
min-seizures                           5
min-asr                                 0
cac-trap-threshold                     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-codes
out-service-response-codes
load-balance-dns-query                 hunt
options
in-translationid
out-translationid

```

```

trust-me                               enabled
request-uri-headers
stop-recurse
local-response-map
ping-to-user-part
ping-from-user-part
in-manipulationid
out-manipulationid
manipulation-string
manipulation-pattern
p-asserted-id
max-register-sustain-rate             0
reuse-connections                      NONE
tcp-keepalive                         none
tcp-reconn-interval                   0
max-register-burst-rate               0
register-burst-window                 0
last-modified-by                      admin@172.18.0.119
last-modified-date                    2014-11-21 16:24:13
sip-authentication-profile
name                                   AuthSIPASMode
methods                                REGISTER
anonymous-methods
digest-realm                          ims.mnc820.mcc311.3gppnetwork.org
credential-retrieval-method           cx
credential-retrieval-config           NN-HSS
last-modified-by                      admin@172.18.0.177
last-modified-date                    2015-10-09 18:51:01
sip-config
state                                  enabled
operation-mode                        dialog
dialog-transparency                   enabled
home-realm-id                         accessAS
egress-realm-id                       accessAS
registrar-domain                      *
registrar-host                        *
registrar-port                        5060
init-timer                             500
max-timer                              4000
trans-expire                           32
initial-inv-trans-expire               0
invite-expire                          180
inactive-dynamic-conn                 32
pac-method                             10
pac-interval                          PropDist
pac-strategy                           1
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
options                                force-unregistration
                                        max-udp-length=0
                                        pai-comply-to-3gpp
add-reason-header                     disabled
sip-message-len                       4096
enum-sag-match                        disabled
extra-method-stats                   disabled
extra-enum-stats                     disabled
registration-cache-limit              0
register-use-to-for-lp                 disabled
add-ucid-header                      disabled
proxy-sub-events

```


allow-pani-for-trusted-only	disabled
atcf-stn-sr	
atcf-psi-dn	
atcf-route-to-sccas	disabled
sag-lookup-on-redirect	disabled
set-disconnect-time-on-bye	disabled
node-functionality	P-CSCF
match-sip-instance	disabled
sa-routes-stats	disabled
sa-routes-traps	disabled
rx-sip-reason-mapping	disabled
last-modified-by	admin@172.18.0.160
last-modified-date	2015-07-07 21:11:59
sip-feature	
name	100rel
realm	
support-mode-inbound	Pass
require-mode-inbound	Pass
proxy-require-mode-inbound	Pass
support-mode-outbound	Pass
require-mode-outbound	Pass
proxy-require-mode-outbound	Pass
last-modified-by	admin@172.18.0.160
last-modified-date	2015-07-07 21:12:23
sip-feature	
name	path
realm	
support-mode-inbound	Pass
require-mode-inbound	Pass
proxy-require-mode-inbound	Pass
support-mode-outbound	Pass
require-mode-outbound	Pass
proxy-require-mode-outbound	Pass
last-modified-by	admin@172.18.0.160
last-modified-date	2015-07-07 21:12:32
sip-feature	
name	precondition
realm	
support-mode-inbound	Pass
require-mode-inbound	Pass
proxy-require-mode-inbound	Pass
support-mode-outbound	Pass
require-mode-outbound	Pass
proxy-require-mode-outbound	Pass
last-modified-by	admin@172.18.0.160
last-modified-date	2015-07-07 21:12:42
sip-interface	
state	enabled
realm-id	accessAS
description	
sip-port	
address	10.0.200.161
port	5060
transport-protocol	UDP
allow-anonymous	all
multi-home-addr	
trans-expire	0
initial-inv-trans-expire	0
invite-expire	0
max-redirect-contacts	0
proxy-mode	
redirect-action	
contact-mode	none
registration-caching	enabled
min-reg-expire	300
registration-interval	1800
route-to-registrar	enabled

```

secured-network                disabled
teluri-scheme                  disabled
uri-fqdn-domain
options
trust-mode                      all
stop-recurse                    401,407
in-manipulationid
out-manipulationid
sip-atcf-feature                disabled
operator-identifier
untrusted-conn-timeout          0
network-id                      ims.mnc820.mcc311.3gppnetwork.org
constraint-name
response-map
local-response-map
route-unauthorized-calls
tcp-keepalive                   none
p-early-media-header           disabled
p-early-media-direction
manipulation-string
manipulation-pattern
tunnel-name
session-timer-profile
unregister-on-connection-loss    disabled
sip-authentication-profile       AuthSIPASMode
ping-response                    disabled
reg-cache-route                  disabled
last-modified-by                 admin@172.18.0.115
last-modified-date               2015-09-17 20:02:42
sip-interface
state                            enabled
realm-id                         coreAS
description
sip-port
    address                       10.0.200.160
    port                           5060
    transport-protocol             UDP
    allow-anonymous                all
    multi-home-addr
trans-expire                      0
initial-inv-trans-expire          0
invite-expire                     0
max-redirect-contacts             0
proxy-mode
redirect-action
contact-mode                      none
registration-caching              disabled
min-reg-expire                    300
registration-interval             3600
route-to-registrar                disabled
secured-network                  disabled
teluri-scheme                    disabled
uri-fqdn-domain
options
trust-mode                      all
stop-recurse                    401,407
in-manipulationid
out-manipulationid
sip-atcf-feature                disabled
operator-identifier
untrusted-conn-timeout          0
network-id
constraint-name
response-map
local-response-map
route-unauthorized-calls
tcp-keepalive                   none

```

```





p-early-media-header                disabled
p-early-media-direction
manipulation-string
manipulation-pattern
tunnel-name
session-timer-profile
unregister-on-connection-loss        disabled
sip-authentication-profile
ping-response                        disabled
reg-cache-route                      disabled
last-modified-by                     admin@172.18.0.119
last-modified-date                   2014-11-21 16:24:13
sip-registrar
name                                 ims.mnc820.mcc311.3gppnetwork.org
state                                 enabled
domains                              ims.mnc820.mcc311.3gppnetwork.org
subscriber-database-method           CX
subscriber-database-config           NN-HSS
authentication-profile               AuthSIPASMode
home-server-route                   sip:10.0.200.160:5060
third-party-registrars
routing-precedence                   REGISTRAR
options
egress-realm-id                      coreAS
location-update-interval             1440
ifc-profile                           ASMode
max-contacts-per-aor                 0
regevent-notification-profile        RegEvent
ims-core
lb-list
unreg-cache-expiry                   300
last-modified-by                     admin@172.18.0.145
last-modified-date                   2015-08-17 19:10:25
system-config
hostname
description
location
mib-system-contact
mib-system-name
mib-system-location
snmp-enabled                         enabled
enable-snmp-auth-traps                disabled
enable-snmp-syslog-notify             disabled
enable-snmp-monitor-traps             disabled
enable-env-monitor-traps              disabled
snmp-syslog-his-table-length          1
snmp-syslog-level                     WARNING
system-log-level                      WARNING
process-log-level                     DEBUG
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
    options
comm-monitor
    state                               disabled
    sbc-grp-id                           0
    tls-profile

```

qos-enable	enabled
call-trace	disabled
internal-trace	disabled
log-filter	all
default-gateway	172.18.0.1
restart	enabled
exceptions	
telnet-timeout	0
console-timeout	0
remote-control	enabled
cli-audit-trail	enabled
link-redundancy-state	disabled
source-routing	enabled
cli-more	disabled
terminal-height	24
debug-timeout	0
trap-event-lifetime	0
ids-syslog-facility	-1
options	
default-v6-gateway	::
ipv6-signaling-mtu	1500
ipv4-signaling-mtu	1500
cleanup-time-of-day	00:00
snmp-engine-id-suffix	
snmp-agent-mode	v1v2



CONNECT WITH US

-  blogs.oracle.com/oracle
-  facebook.com/oracle
-  twitter.com/oracle
-  oracle.com

Oracle Corporation, World Headquarters

500 Oracle Parkway
Redwood Shores, CA 94065, USA

Worldwide Inquiries

Phone: +1.650.506.7000
Fax: +1.650.506.7200

Integrated Cloud Applications & Platform Services

Copyright © 2015, Oracle and/or its affiliates. All rights reserved. This document is provided *for* information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 0416