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Oracle Communications Unified Session Manager with Openmind Networks RCS Interoperability Application Note

Technical Application Note

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Intended Audience

This document is intended for use by Oracle Systems Engineers, third party Systems Integrators, and end users of the Oracle Communications Session Border Controller and Core Session Manager Products. It assumes that the reader is familiar with basic operations of the Oracle Communications 4500 platform and basic administration of the Session Border controller.

Document Overview

This technical application note documents the RCS Interoperability testing completed by Oracle Communications Core Session manager and Openmind Networks Evolve traffic control RCS Message Application Server (hereafter MAS) while giving an overview on the configuration on the Openmind MAS and Oracle Unified Session Manager (USM). It should be noted that while this application note focuses on the optimal configuration between USM and Openmind MAS, production environments in different customer networks will have additional configuration parameters that are specific to other applications.

Introduction

Rich Communications Suite

Rich Communications suite provides a framework for enhanced multimedia services such as enhanced phonebook – contact information, presence & discovery, enhanced messaging, like store and forward, file, location sharing and enriched calls – with multimedia file transfer during a call.

Oracle Communications – Openmind Networks Partnership

Oracle Communications network session delivery and control infrastructure enables service providers to effectively roll out real-time communications services such as VoLTE, Rich Comunication suite, consumer VoIP and OTT services. Openmind networks provides Communication Services Platform delivering standards based, telecom grade, legacy and future IP based services such as Rich communication services including video, voice, file transfer, chat and group chat. The Oracle-openmind networks combined solution delivers a full IMS session delivery network satisfying the IMS service components to provide a full suite of real-time communications.

Oracle Communications Unified Session Manager

Oracle Communications Unified Session Manager combines an agile IMS session core with field-proven security, reliability, interoperability and regulatory compliance capabilities of the Oracle Session Border Controller in an extremely cost-effective, rapidly deployale product. Oracle USM can be used as a standalone session core with an Application server to deliver services in an IMS network. Oracle Communications Unified Session Manager builds upon Oracle Communications Session Border Controller, which incorporates multiple functions including the following:

- SIP registrar
- Application server coordination
- External interconnect interfaces
- Multiple subscriber database query options (for authentication, authorization, location update, and lookup)
- Integrated SIP session routing
- Industry-leading SBC

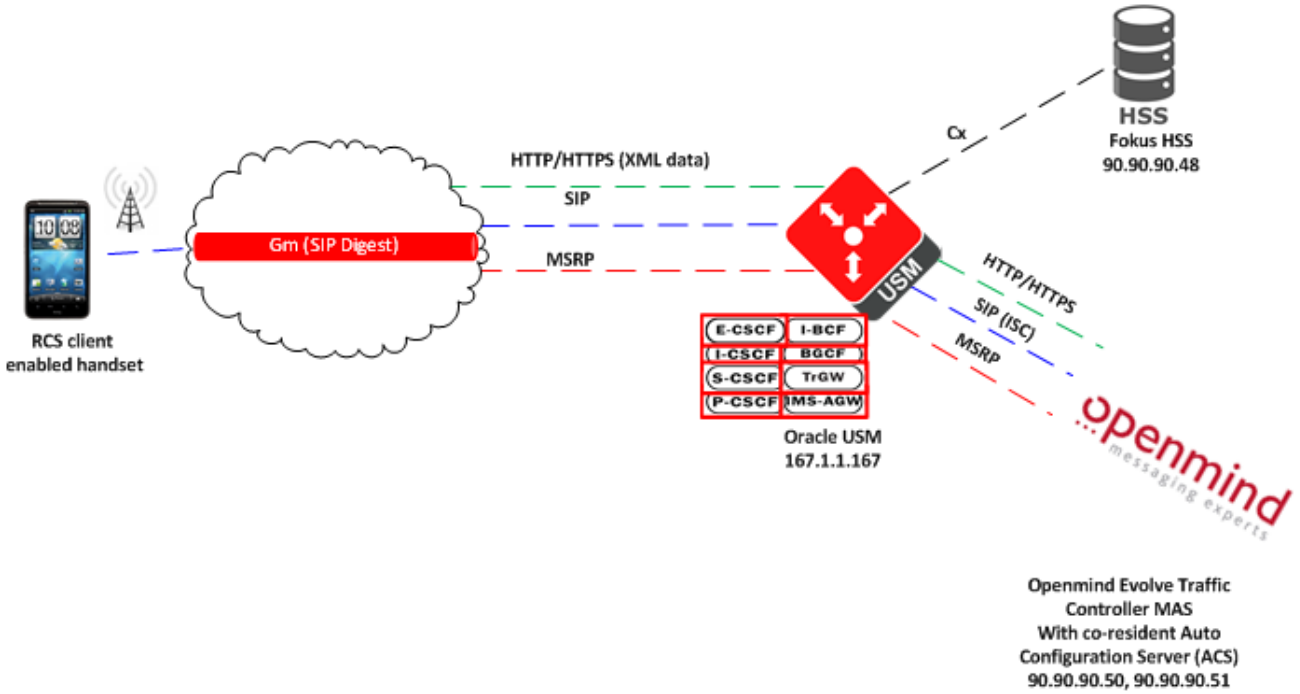
Application Overview

Rich Communications Services or Suite (RCS) is a global initiative that enables delivery of communications services that go beyond the regular voice and SMS, extending a rich experience to customers and providing services such as instant messaging, live video, video share, file share, group chat across any device on any network.

RCS leverages the existing IP Multimedia Subsystem framework and architecture and the 3GPP specifications. It enhances the experience of customers by including richer means of communications such as content sharing, instant messaging, social presence information, file share, etc. that are available using the IMS all IP network.

The Oracle CGBU Partner lab was used to prototype the IMS network and RCS environment with an Oracle USM that combines the P-CSCF, I and S-CSCF capabilities in a single product, a home subscriber server (HSS) for subscriber information/repository and the Openmind Networks Evolve Traffic Control Nodes that has onboard Auto Configuration server that devices use for intial provisioning/XML file downloading. A SIP Access, P-CSCF based configuration was built on the USM on its access edge combined with IMS session core capabilities to interact via Cx reference point with the HSS to download authentication vectors, filter criteria information and the ISC based reference point with the Openmind MAS for RCS services. WIT RCS clients known as “Joyn” were installed on Android handsets and when the application is launched, it will auto configure (download provisioning XML info) and register to the A-SBC function of the USM in the lab over 4G or Wi-Fi networks.

Solution High Level Diagram



As shown in the above diagram, the Oracle USM combines the IMS interfaces into one single product. An alternate recommended architecture when scaling for large deployments is to have Oracle SBC (4600/6100/6300 platforms) as P-CSCF and ATCF/ATGW in conjunction with the virtualized Oracle CSM (I, S-CSCF) deployed with Openmind MAS. For further information on this option, please contact your Oracle Sales representative.

Registration and User profile download

Registration from an android device running the WIT RCS client “joyn” used the auto configuration feature of the Openmind Evolve Traffic Control server. The server enables client authentication, authorization and configuration in case of Android and iOS devices.

A user device will auto configure itself when it is configured to connect to a URI in the Operator network from where it will receive the configuration. The Openmind Evolve ACS provides this service and is a resident module on the Traffic Control servers. When contacted first the client sends the IMSI of the handset. The ACS resolves the MSISDN from the IMSI and then a one time password associated with the subscriber along with list of services they are entitled to use is sent. This information is used to authenticate the subscriber and to then push the configuration data to the client in the form of an XML document over HTTPS.

Upon receiving the IMS network information, the device will then register via SIP to the IMS network comprising of Oracle USM, HSS and Openmind MAS. Once registered, it will perform user discovery (capabilities exchange) by going through phone address book and determining which contacts are RCS capable (SIP OPTIONS exchange). The focus of this testing is to prove Interoperability between the Oracle Communications USM and the Openmind Networks Evolve Traffic Control systems.

Lab Configuration and Software/Hardware Tools

The test environment consisted of the following components:

- Oracle Communications Unified Session Manager (USM)
- Openmind Networks Evolve Traffic Control Message Application Server cluster
- Auto-configuration Server installed on openmind MAS
- Fokus/Open IMS Core HSS SMD (subscriber management database)
- WIT RCS client - Joyn (installed on Android handsets)

The following tables provide the software hardware versions used for the network components:

Oracle Communications Unified Session Manager System Specifications

Hardware	Oracle 4500 platform
Software Release	nnSCX6315m2p1
Software modules enabled	SIP, Routing, Database registrar, External Policy Services, External BW Management, Cx, High Availability

Openmind Networks Traffic Control Evolve System Specifications

Application	Virtualized
Virtualised OS	Centos 6.3
Software Release	Traffic Control 13Q3 with Evolve Licensing
Evolve Modules Enabled	SIP Registrar, SIP OPTIONS Server, Messaging Application Server, Auto-configuration Server

Third Party Equipment

Vendor	WIT
Product Name	Joyn RCS Client
Software Release	Auto-configurable, Downloadable RCS App RCS 5.1 v2.5.2

Phase 1 – Configuring Oracle USM

In this section we describe the major steps for configuring the Oracle Unified Session Manager in an access scenario for IMS subscriber registration/authentication as well as to connect to Openmind MAS and HSS.

In Scope

This section focuses on configuration highlights in USM to establish connection with HSS and Openmind MAS. For detailed concepts and configuration on the USM, please contact your Oracle representative and/or refer to http://docs.oracle.com/cd/E52548_01/doc/usm_scx6315_essentials_M1.pdf

Out of Scope

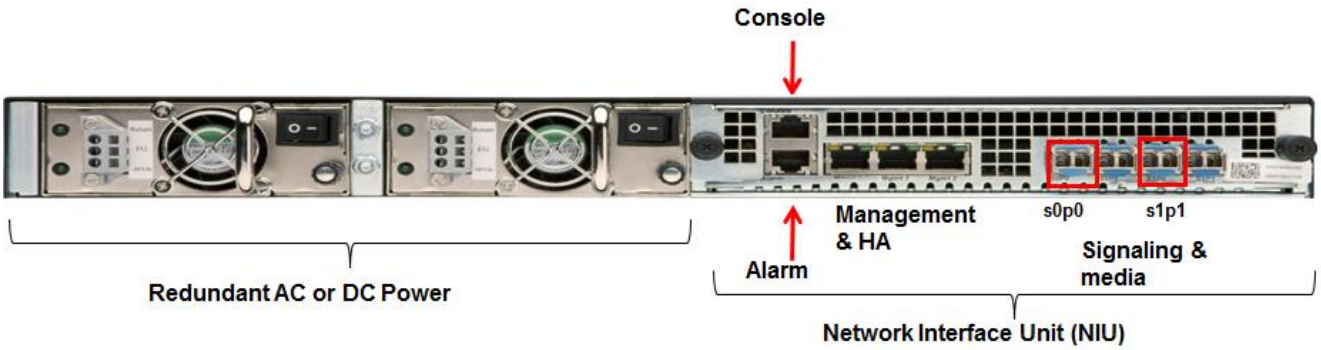
- Network management configuration of the USM

What you will need

- Serial Console cross over cable with RJ-45 connector
- Terminal emulation application such as PuTTY or HyperTerm
- Passwords for the User and Superuser modes on the Oracle USM
- IP address to be assigned to management interface (Wancom0) of the USM - the Wancom0 management interface must be connected and configured to a management network separate from the service interfaces. Otherwise the USM is subject to ARP overlap issues, loss of system access when the network is down, and compromising DDoS protection. Oracle does not support configurations with management and media/service interfaces on the same subnet.
- IP addresses to be used for the USM SIP interface (Access side – P-CSCF signaling address) and Core side (towards HSS and Openmind MAS)
- IP address of the next hop gateway in the IMS core network

Configuring the USM

Once the Oracle USM is racked and the power cable connected, you are ready to set up physical network connectivity. Oracle USM is available on the Oracle SBC platforms such as 4500, 4600, 6100 and 6300 and uses the same leading integrated SW.



As seen in the above picture, the 4500 platform has a field replaceable 4 x 1 Gb/sec NIU. Plug the slot 0 port 0 (s0p0, leftmost 1G port of the quad 1GbE signaling ports on the NIU) interface into your outside (Internet facing) network and the slot 1 port 0 (s1p0, third from left of the quad 1GbE signaling ports on the NIU) interface into your inside (service provider core – IMS network facing) network. Once connected, you are ready to power on and perform the following steps.

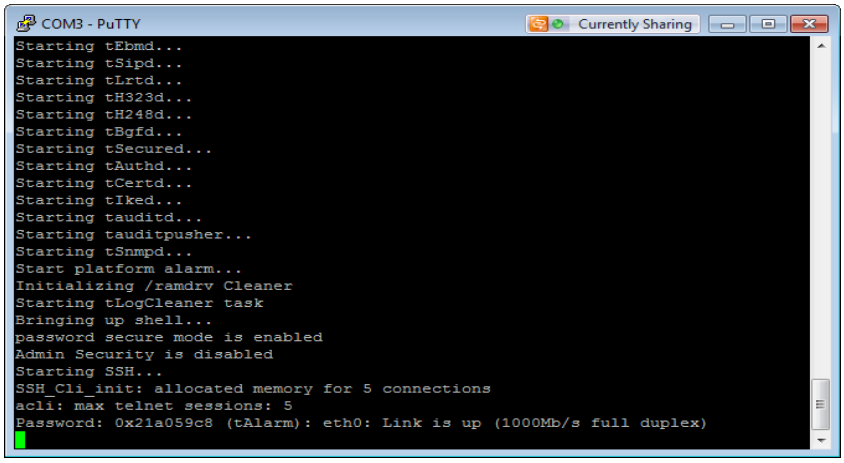
All commands are in bold, such as **`configure terminal`**; parameters in bold red such as RCS-USM are parameters which are specific to an individual deployment. **Note:** The ACLI is case sensitive.

Establish the serial connection and logging in the USM

Confirm the USM is powered off and connect one end of a straight-through Ethernet cable to the front console port (which is active by default) on the USM and the other end to console adapter that ships with the USM, connect the console adapter (a DB-9 adapter) to the DB-9 port on a workstation, running a terminal emulator application such as PuTTY. Start the terminal emulation application using the following settings:

- Baud Rate=115200
- Data Bits=8
- Parity=None
- Stop Bits=1
- Flow Control=None

Power on the USM and confirm that you see the following output from the bootup sequence.



Enter the following commands to login to the USM and move to the configuration mode. Note that the default USM password is "**acme**" and the default super user password is "**packet**".

```
Password: acme
RCS-USM> enable
Password: packet
RCS-USM# configure terminal
RCS-USM(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 USM by going to

RCS-USM#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

```
RCS-USM#(configure)bootparam
'.' = clear field;  '-' = go to previous field;  q = quit
boot device             : eth0
processor number        : 0
host name               : acmesystem
file name               : /code/images/nnSCX6315m2p1.tar --- >location
where the software is loaded on the USM
inet on ethernet (e)    : 10.20.30.40:ffffff80 --- > This is the ip
address of the management interface of the USM, type the IP address and
mask in hex
inet on backplane (b)   :
host inet (h)           :
gateway inet (g)        : 10.20.30.40.1 --- > gateway address here
user (u)                : vxftp
```

```
ftp password (pw)  (blank = use rsh)      : vxftp
flags (f)                 :
target name (tn)          : RCS-USM
startup script (s)        :
other (o)                 :
```

The following section walks you through configuring the Oracle Communications USM configuration required to work with Openmind MAS and the HSS. The USM combines the roles of the P-CSCF, I-CSCF and S-CSCF to authenticate RCS subcribers and provide Rich communication services.

High Availability

The wancom1 and wancom 2 port which is on the rear panel of the 4500 system is used for the purpose of High Availability. Please refer to the Oracle Session Border Controller S-CX6.3.0ACLI Configuration guide for more detailed update on High availability configuration. (http://docs.oracle.com/cd/E50369_01/doc/sbc_scx630_acliconfiguration.pdf)

The following section entails notable configuration highlights that pertain to interwork with the Openmind MAS and HSS. A full copy of the configuration that was used for this integration is elaborated in the appendix section as well.

Configuration Highlights

The USM configuration follows in general an access SBC scenario configuration with core side Cx and application server configuration. Detailed configuration concepts are outlined at http://docs.oracle.com/cd/E52548_01/doc/usm_scx6315_essentials_M1.pdf. A few notable highlights are explained below:

Network-id

The visited network identifier is defined on access sip-interface that corresponds to the serving domain in the USM. The value is shown below in the snippet below:

```
sip-interface
        state                         enabled
        realm-id                      access
        description
        sip-port
                address                         167.1.1.167
                port                            5060
                transport-protocol              UDP
                tls-profile
                multi-home-addrs
                allow-anonymous                 registered
                ims-aka-profile
        sip-port
                address                         167.1.1.167
                port                            5060
                transport-protocol              TCP
                tls-profile
                multi-home-addrs
                allow-anonymous                 registered
                ims-aka-profile
        carriers
```

```
        trans-expire                    0
        invite-expire                   0
        max-redirect-contacts           0
        proxy-mode
        redirect-action
        contact-mode                    none
        nat-traversal                   always
        nat-interval                    60
        tcp-nat-interval                90
        registration-caching            enabled
        min-reg-expire                  300
        registration-interval           3600
        route-to-registrar              enabled
        …
        max-incoming-conns              0
        per-src-ip-max-incoming-conns   0
        inactive-conn-timeout           0
        untrusted-conn-timeout          0
        network-id                      apktbedfordrcs.com
        ext-policy-server
        default-location-string
        charging-vector-mode            pass
```

Connectivity with HSS

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

- Define Home-subscriber-server configuraton
- 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                            openims-bedford
        state                           enabled
        address                         90.90.90.48
        port                            3868
        realm                           for-hss
        origin-host-identifier          pe-usm-omn
        origin-realm                    for-hss
        destination-host-identifier
        watchdog-ka-timer               0
```

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                            auth-pe
        methods                         REGISTER
        anonymous-methods
        digest-realm                    apktbedfordrcs.com
        credential-retrieval-method     cx
        credential-retrieval-config     openims-bedford
```

Define ifc-profile

Configure and define ifc-profile in the USM to download the filter criteria from HSS for each subscriber and invoke service execution for RCS services). The USM will obtain the Openmind MAS as AS URI in the iFCs that are downloaded from the HSS. No onboard iFC files are used therefore default and shared ifc filenames are left blank. (Configure terminal ---- > session-router --- > ifc-profile

```
ifc-profile
        name                                    forbedford-omn
        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                            apktbedfordreg
        state                           enabled
        domains                         apktbedfordrcs.com
        subscriber-database-method      CX
        subscriber-database-config      openims-bedford
        authentication-profile          auth-pe
        home-server-route               sip:90.90.90.45:5080
        third-party-registrars
        routing-precedence              REGISTRAR
        egress-realm-id                 pe-aws-enum
        location-update-interval        1440
        ifc-profile                     for-bedfordomn
        max-contacts-per-aor            0
        regevent-notification-profile   bedford-omn
```

Define Openmind MAS as Session-agent

The USM will obtain the Openmind MAS as AS URI in the iFCs that are downloaded from the HSS. We configure the MAS as a session-agent and enable trust-me parameter as the application server is a trusted entity in the service provider's mobile network infrastructure as show below

```
session-agent
        hostname                        percsmas.o14s.com
        ip-address                      90.90.90.50
        port                            5060
        state                           enabled
        app-protocol                    SIP
        app-type
        transport-method                UDP
        realm-id                        pe-openmind-as
```

```
        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
        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
        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
        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
        monitoring-filters
        session-recording-server
        session-recording-required      disabled
```

Create static flow in USM

Static flow feature allows network traffic that matches specific criteria to pass through the Oracle USM unrestricted. The Oracle USM's static flow feature allows auto configuration signaling (HTTP/HTTPS and one time password) on specific ports to allow this traffic and reach the resident ACS in the Openmind environment. The Auto configuration server module is installed and resident on the Openmind MAS. The RCS device in its auto discovery uses HTTP/HTTPS to obtain XML initial configuration from the ACS via the static flow specific configuration. Below is the snippet of the static flow configuration to permit HTTP/HTTPS, File transfer and one-time-password (SMS) traffic.

```
static-flow
        in-realm-id                     access
        description                     for ACS http flow
        in-source                       0.0.0.0
        in-destination                  167.1.1.155:80
        out-realm-id                    pe-openmind-as
        out-source                      90.90.90.45
        out-destination                 90.90.90.50:80
        protocol                        TCP
        alg-type                        NAPT
        start-port                      3000
        end-port                        3100
        flow-time-limit                 0
        initial-guard-timer             60
        subsq-guard-timer               60
        average-rate-limit              0

static-flow
        in-realm-id                     access
        description                     for https ACS flow
        in-source                       0.0.0.0
        in-destination                  167.1.1.155:443
        out-realm-id                    pe-openmind-as
        out-source                      90.90.90.45
        out-destination                 90.90.90.50:443
        protocol                        TCP
        alg-type                        NAPT
        start-port                      4000
```

```
        end-port                        4100
        flow-time-limit                 0
        initial-guard-timer             60
        subsq-guard-timer               60
        average-rate-limit              0
```

Port 55000 on Openmind MAS is configured to accept HTTP File transfer request for intial configuration download and port 42775 for one time password (Via SMS). The static flow entries below depict the same.

```
static-flow
        in-realm-id                     access
        description                     for HTTP FT
        in-source                       0.0.0.0
        in-destination                  167.1.1.155:55000
        out-realm-id                    pe-openmind-as
        out-source                      90.90.90.45
        out-destination                 90.90.90.50:55000
        protocol                        TCP
        alg-type                        NAPT
        start-port                      6000
        end-port                        6100
        flow-time-limit                 0
        initial-guard-timer             60
        subsq-guard-timer               60
        average-rate-limit              0

static-flow
        in-realm-id                     pe-openmind-as
        description                     for SMS code
        in-source                       90.90.90.50
        in-destination                  90.90.90.45:42775
        out-realm-id                    access
        out-source                      167.1.1.155
        out-destination                 83.71.251.185:42775
        protocol                        TCP
        alg-type                        NAPT
        start-port                      7000
        end-port                        7100
        flow-time-limit                 0
        initial-guard-timer             60
        subsq-guard-timer               60
        average-rate-limit              0
```

This completes the IMS and static flow configuration on the USM. A full copy of the USM configuration is outlined in the Appendix section.

Phase 2- Configuring Openmind Message Application Server

In this section we describe the major steps for configuring the Openmind Message Application Server to connect to the Oracle USM for RCS application.

In Scope

This section focuses on configuration highlights in Openmind MAS to establish connection with Oracle USM and the IMS settings in the Traffic control evolve modules. Traffic control evolve server is installed in as a pair of nodes, with configuration on primary being replicated on the secondary node

Out of Scope

- Installation, Network management and redundant configuration of the Openmind MAS

What you will need

- VMware ESXi vSphere client to access Openmind MAS console if required
- Google Chrome/Firefox/IE browser to login to the Web UI of the MAS to configure it
- Login credentials for the MAS
- IP address to be assigned to management interface of the MAS TC1 and TC2.
- IP address of the USM ISC interface

Log into Traffic Control Evolve 1 & 2 pointing browser to http://<ipaddress>:8888/Wing with credentials omn/omn

Configuring the Openmind MAS

The main configuration steps required are:

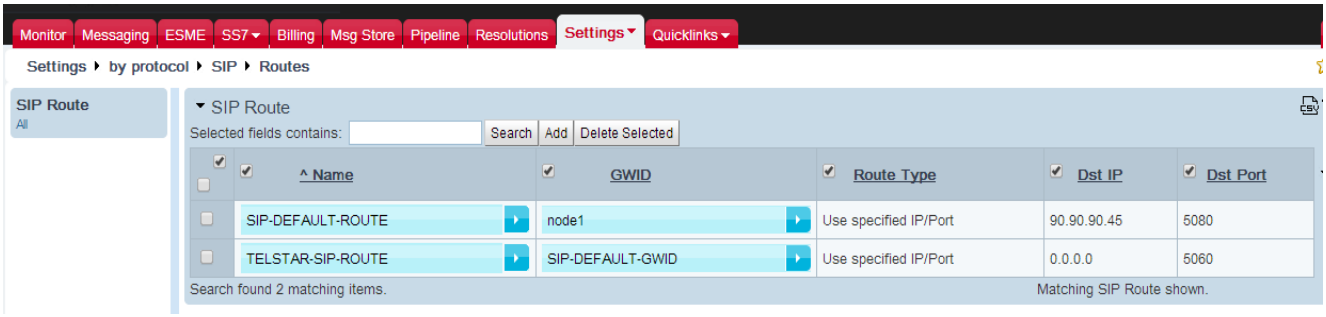
- Define sip gateway and route in Traffic Control evolve server (to route requests back to Oracle USM)
- Define IMS settings
- Define IMS Application server settings
- ACS configuration – Device management and OTP settings

SIP Gateway in TC

Settings --- > by protocol --- > SIP --- > Gateway Identities

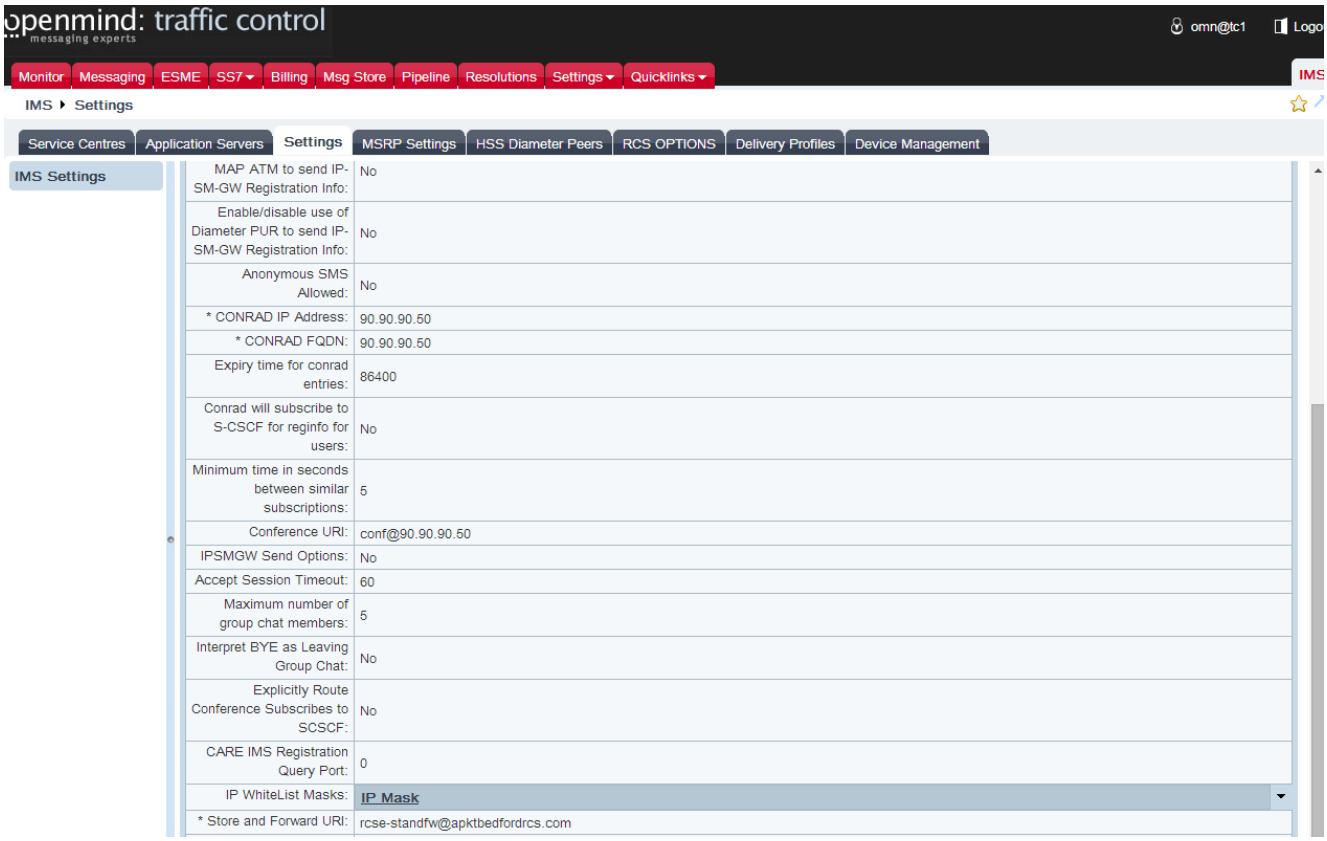
SIP Route in TC

Settings --- >by protocol--- > Routes

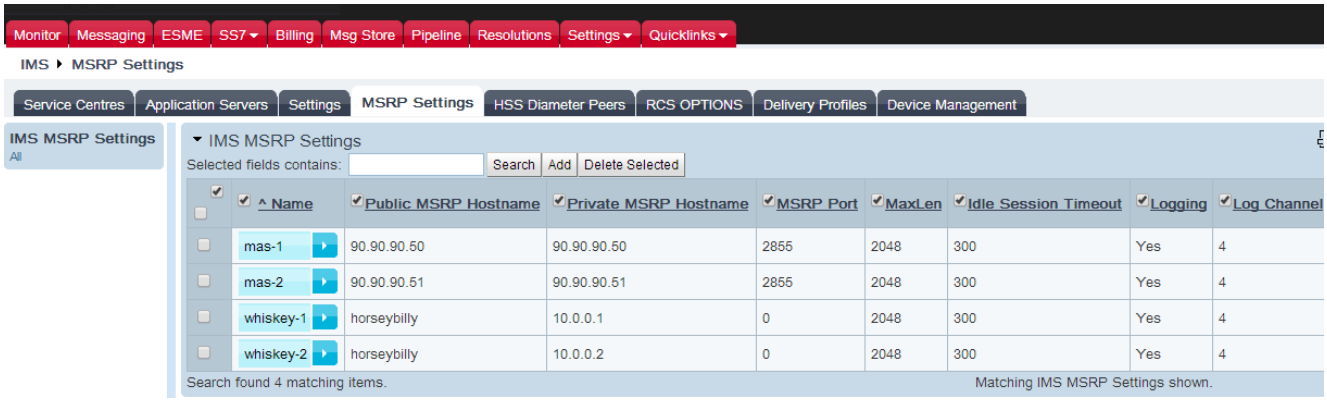


IMS Settings in TC

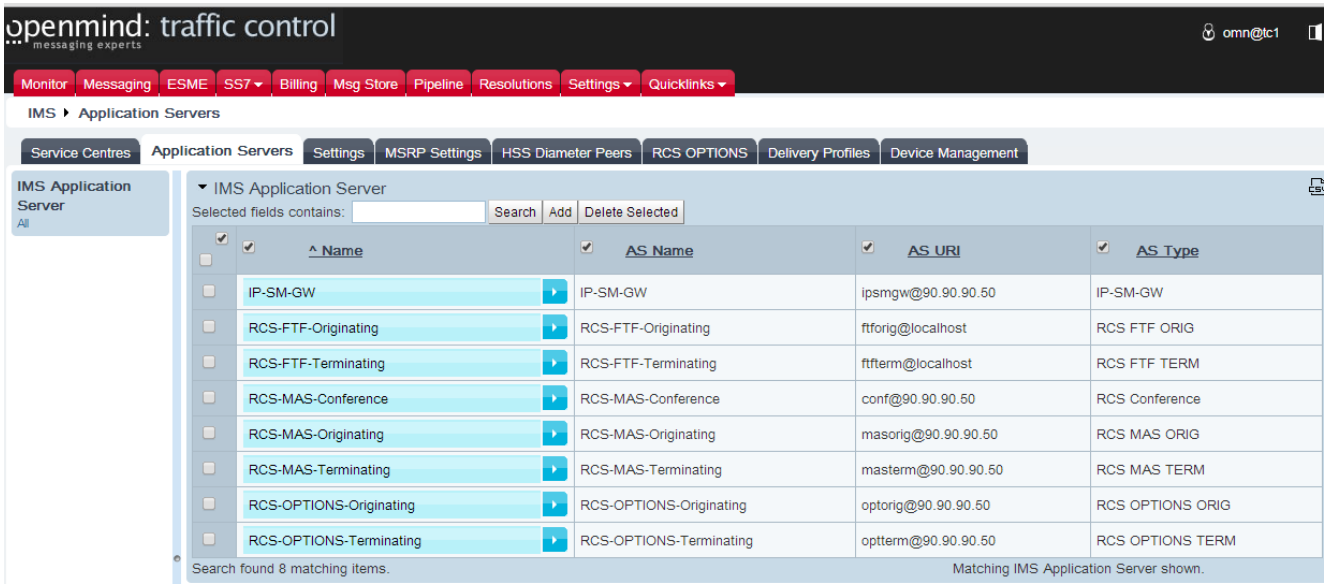
Configure conference URI, message Store and Forward URI settings in IMS tab in the openmind MAS as shown below:



IMS – MSRP Settings

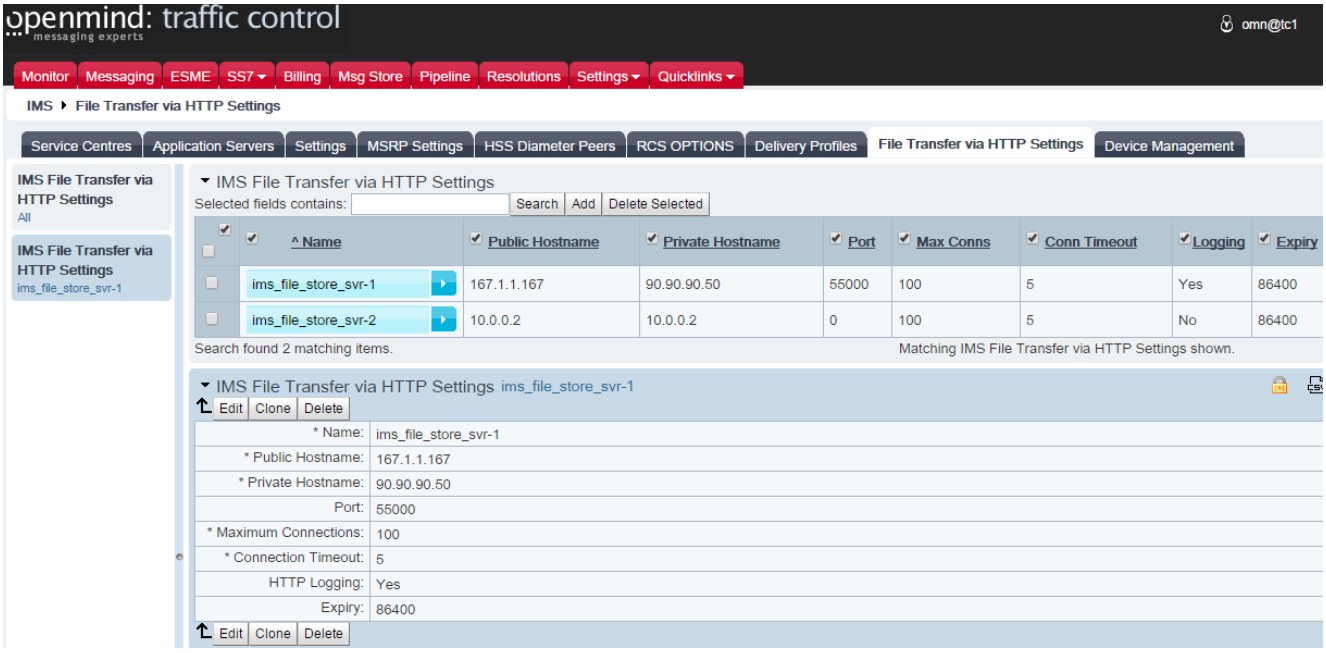


IMS Tab – Application Servers settings

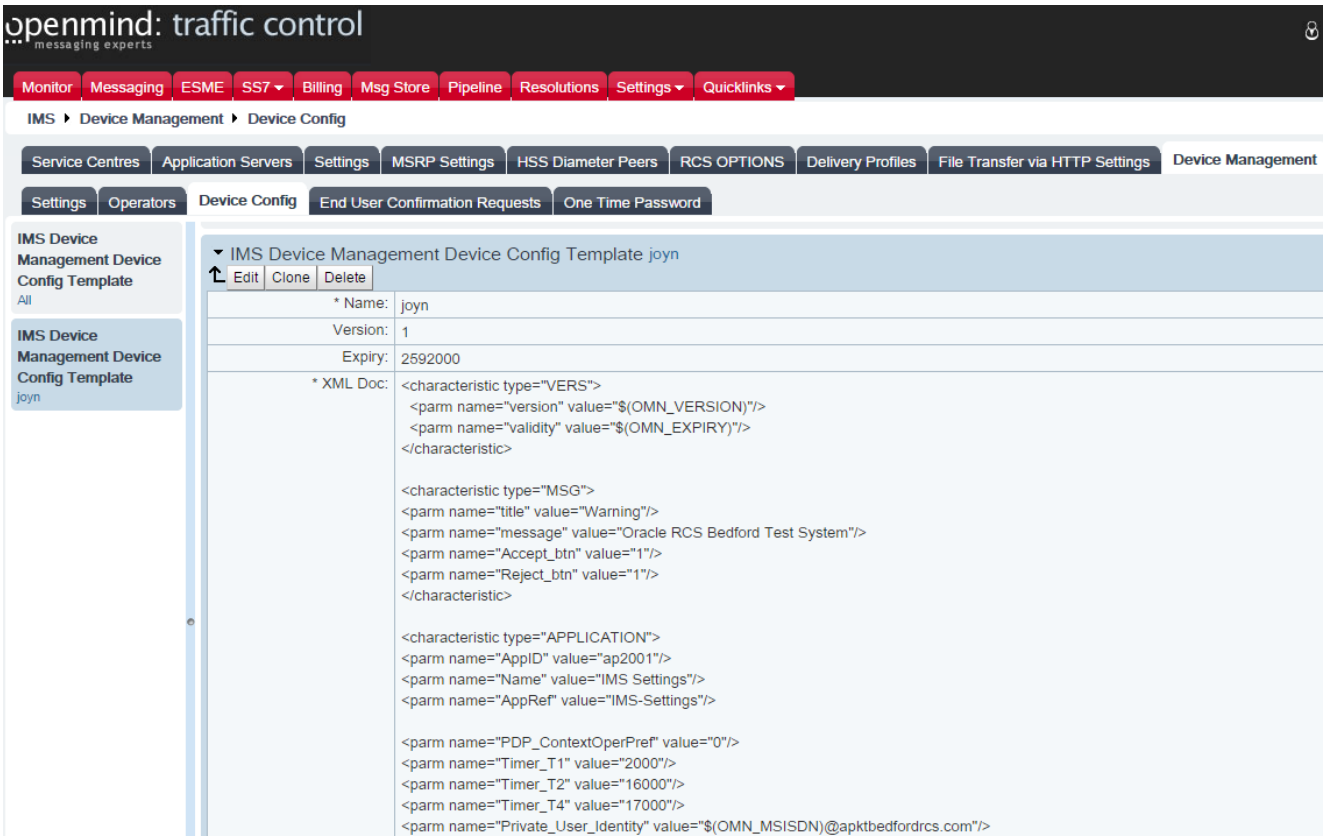


ACS Settings – File transfer and Device Management configuration

Auto Configuration settings are defined in IMS settings under File transfer via HTTP Settings tab and the Device management tab



Device management parameters and XML document that the ACS would transfer to RCS device via HTTP/HTTPS is configured as shown below:



Phase 3- Configuring OpenIMS Core HSS (Fokus)

In this section we describe the major steps for configuring the Fokus HSS to connect to Oracle USM and defining IMS subscribers, filter criteria for service execution.

In Scope

Configuration highlights of the HSS, filter criteria, application server definition

Out of Scope

Installation, and network management

What you will need

- VMware ESXi vSphere client to access the 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 TC1 and TC2.
- IP address of the diameter interface

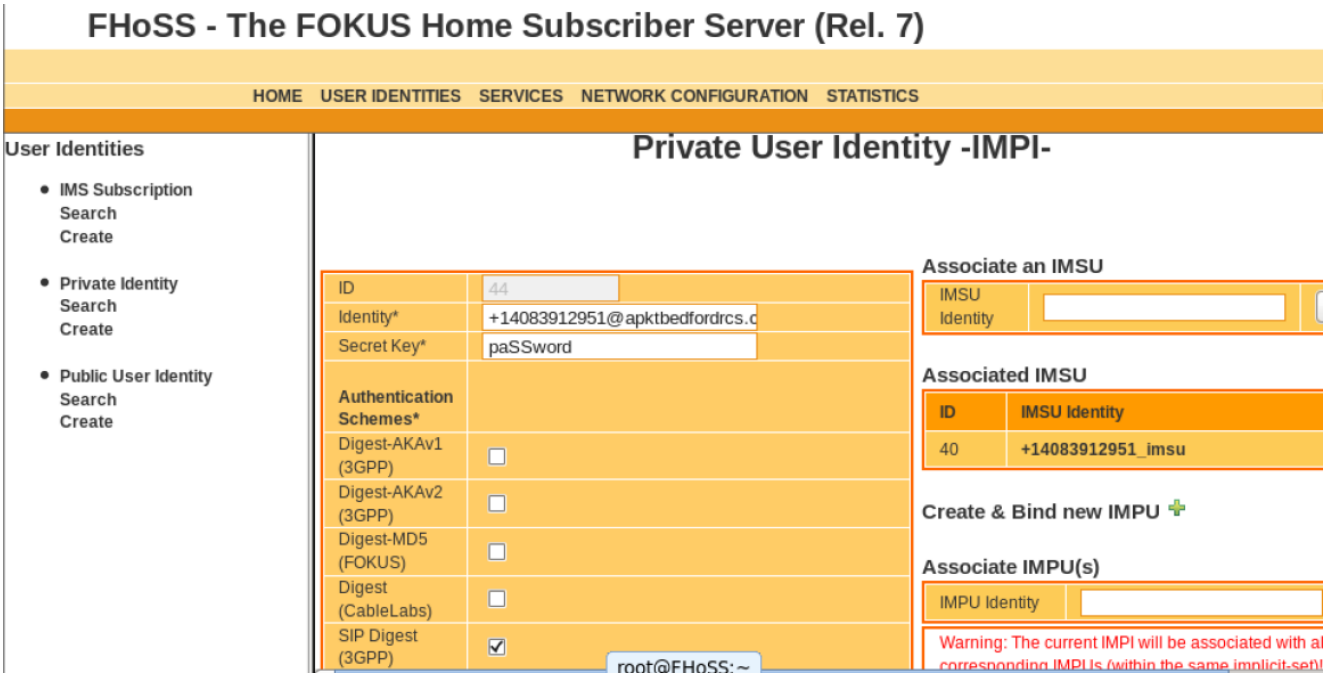
Log into Fokus hss by pointing the browser to http://<ipaddress>:8080 with the login credentials

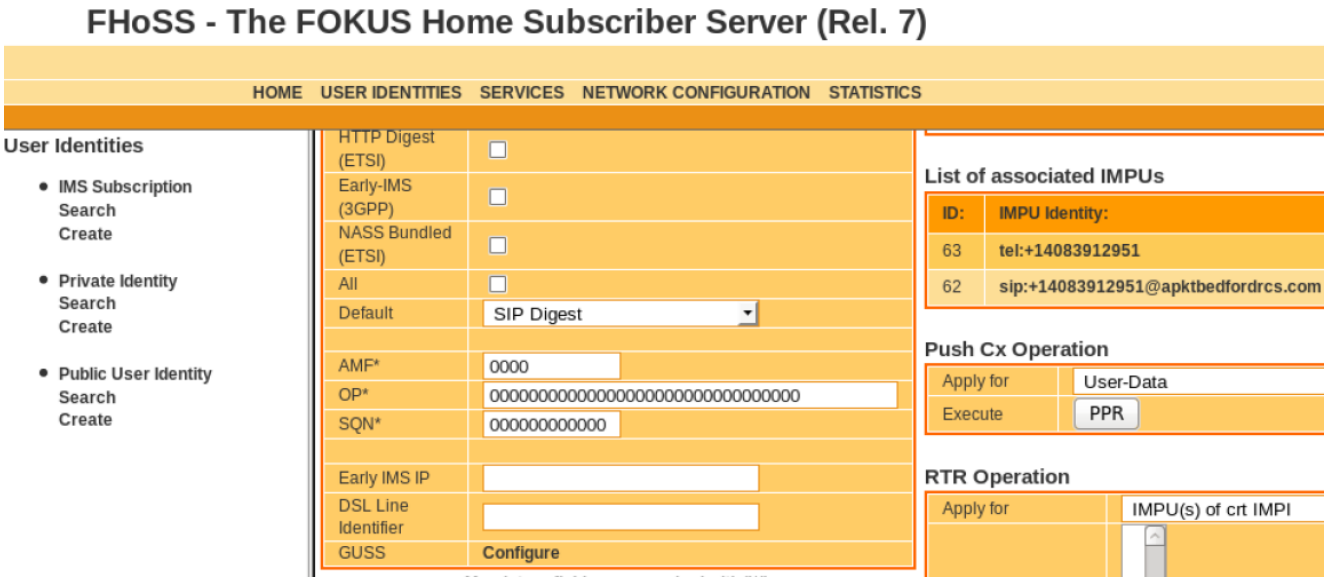
Configuration Highlights

Major configuration steps required on the HSS are:

- IMPI/IMPU configuration
- Define Service profile
- Application server definition
- Initial filter criteria and Trigger points

IMPI/IMPU


FHoSS - The FOKUS Home Subscriber Server (Rel. 7)
HOME
USER IDENTITIES
SERVICES
NETWORK CONFIGURATION
STATISTICS
User Identities
IMS Subscription
Search
Create
Private Identity
Search
Create
Public User Identity
Search
Create
Private User Identity -IMPI-
ID
44
Identity*
+14083912951@apktbedfordrcs.c
Secret Key*
paSSword
Authentication Schemes*
Digest-AKAv1 (3GPP)
Digest-AKAv2 (3GPP)
Digest-MD5 (FOKUS)
Digest (CableLabs)
SIP Digest (3GPP)
root@FHoSS: ~
Associate an IMSU
IMSU Identity
Associated IMSU
ID
IMSU Identity
40
+14083912951_imsu
Create & Bind new IMPU
Associate IMPU(s)
IMPU Identity
Warning: The current IMPI will be associated with al
corresponding IMPUs (within the same implicit-set)!


FHoSS - The FOKUS Home Subscriber Server (Rel. 7)
HOME
USER IDENTITIES
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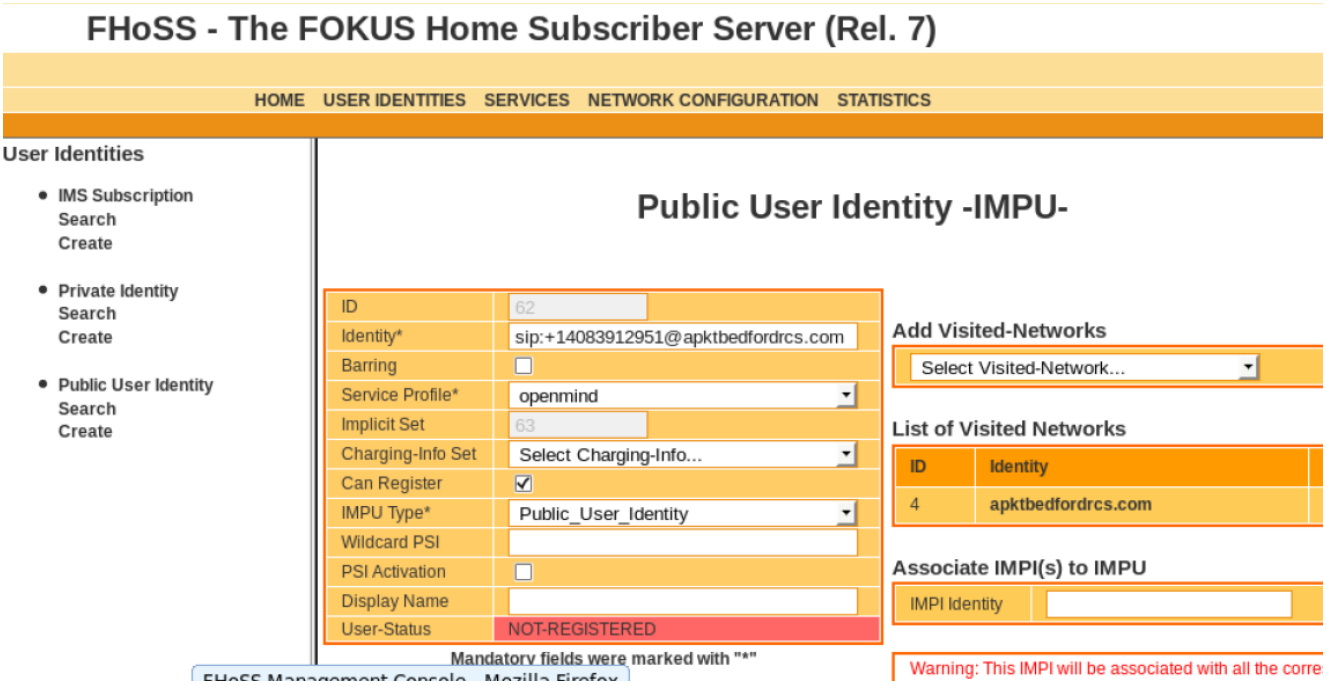
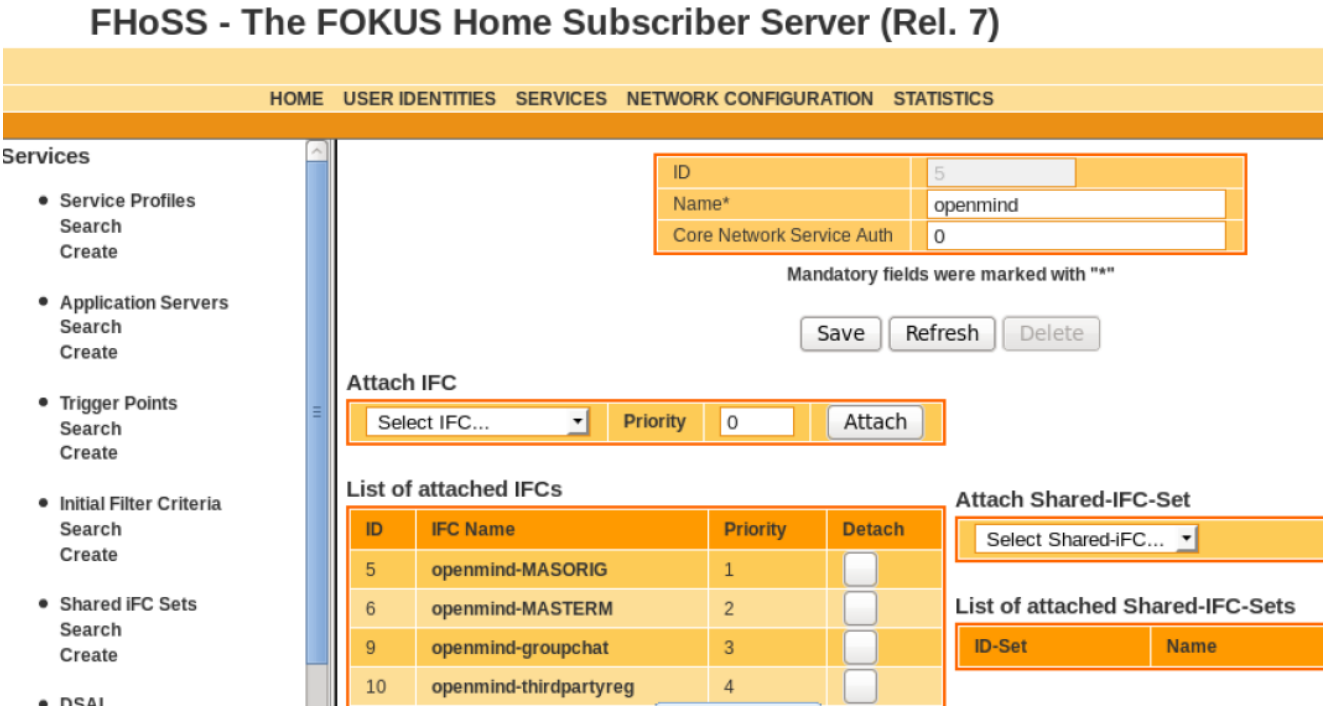
NETWORK CONFIGURATION
STATISTICS
User Identities
IMS Subscription
Search
Create
Private Identity
Search
Create
Public User Identity
Search
Create
HTTP Digest (ETSI)
Early-IMS (3GPP)
NASS Bundled (ETSI)
All
Default
SIP Digest
AMF*
0000
OP*
00000000000000000000000000000000
SQN*
000000000000
Early IMS IP
DSL Line Identifier
GUSS
Configure
List of associated IMPUs
ID:
IMPU Identity:
63
tel:+14083912951
62
sip:+14083912951@apktbedfordrcs.com
Push Cx Operation
Apply for
User-Data
Execute
PPR
RTR Operation
Apply for
IMPU(s) of crt IMPI


FHoSS - The FOKUS Home Subscriber Server (Rel. 7)
HOME
USER IDENTITIES
SERVICES
NETWORK CONFIGURATION
STATISTICS
User Identities
IMS Subscription
Search
Create
Private Identity
Search
Create
Public User Identity
Search
Create
Public User Identity -IMPU-
ID
62
Identity*
sip:+14083912951@apktbedfordrcs.com
Barring
Service Profile*
openmind
Implicit Set
63
Charging-Info Set
Select Charging-Info...
Can Register
IMPU Type*
Public_User_Identity
Wildcard PSI
PSI Activation
Display Name
User-Status
NOT-REGISTERED
Mandatory fields were marked with "*"
Add Visited-Networks
Select Visited-Network...
List of Visited Networks
ID
Identity
4
apktbedfordrcs.com
Associate IMPI(s) to IMPU
IMPI Identity
Warning: This IMPI will be associated with all the corre

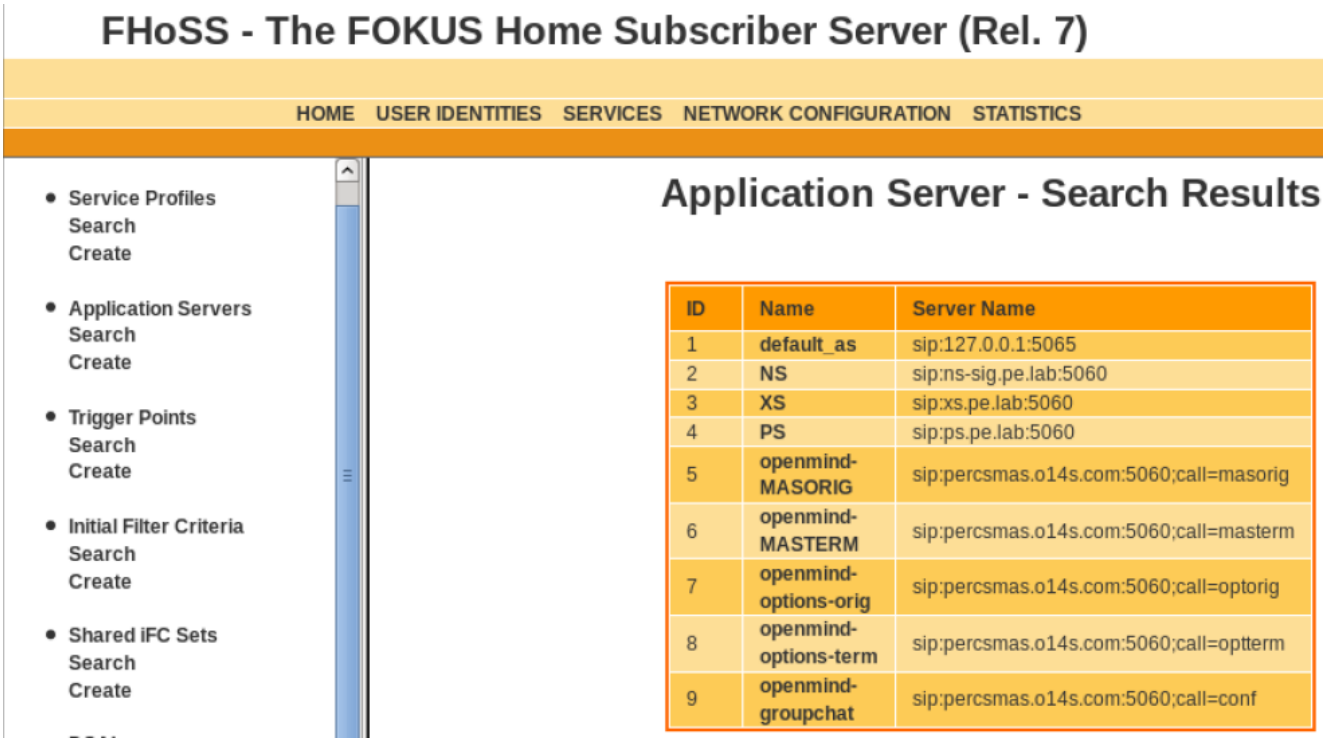
Define Service Profile in HSS

A service profile named as openmind is defined in the HSS



Application Server Definition

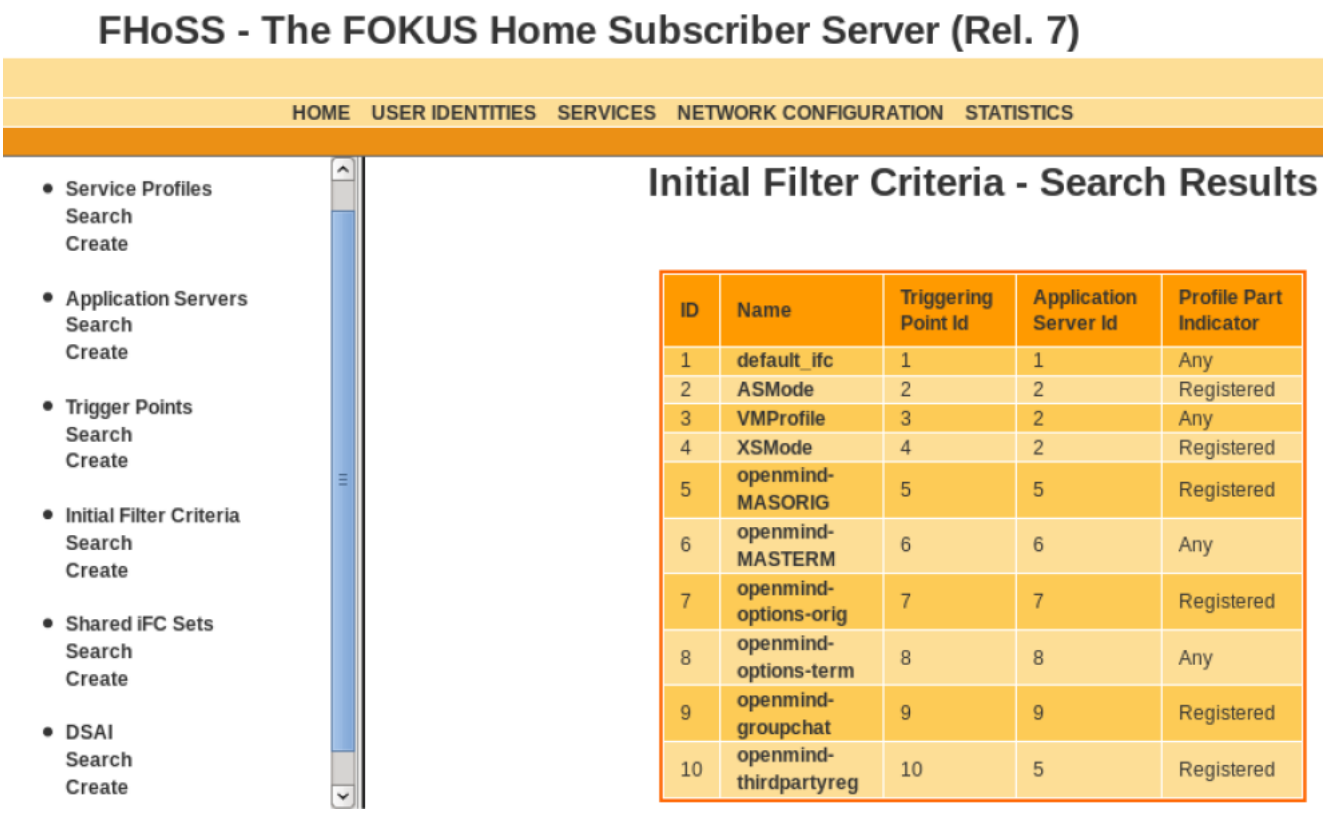
Define the message application server (session-agent hostname as defined in USM) with the different call tags for originating, terminating, etc. services as shown below

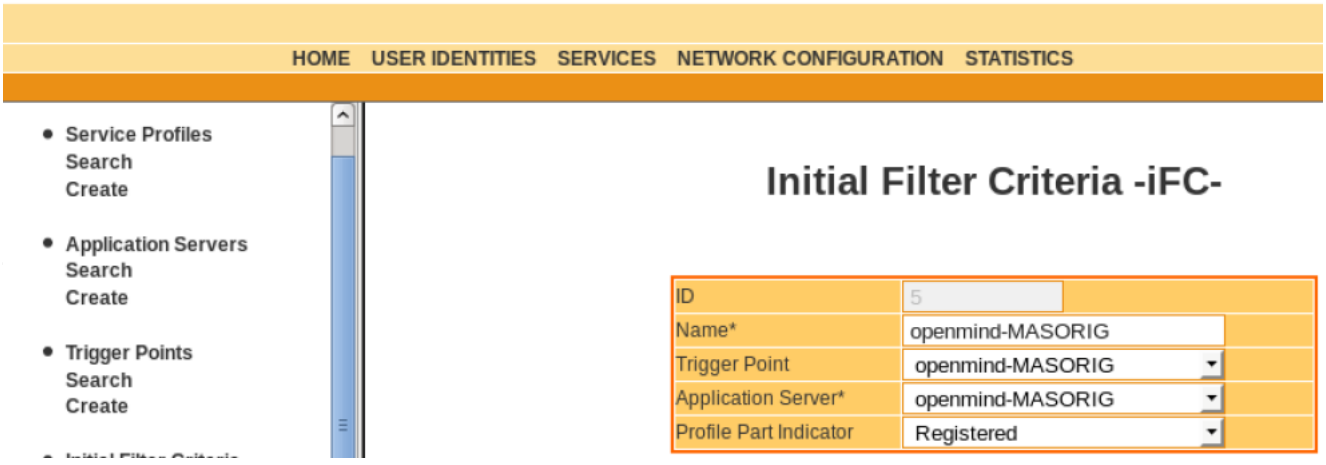


ID	Name	Server Name
1	default_as	sip:127.0.0.1:5065
2	NS	sip:ns-sig.pe.lab:5060
3	XS	sip:xs.pe.lab:5060
4	PS	sip:ps.pe.lab:5060
5	openmind-MASORIG	sip:percsmas.o14s.com:5060;call=masorig
6	openmind-MASTERM	sip:percsmas.o14s.com:5060;call=masterm
7	openmind-options-orig	sip:percsmas.o14s.com:5060;call=optorig
8	openmind-options-term	sip:percsmas.o14s.com:5060;call=optterm
9	openmind-groupchat	sip:percsmas.o14s.com:5060;call=conf

Initial filter criteria and Trigger points

Define the filter criteria and attach them to the defined service profile





FHoSS - The FOKUS Home Subscriber Server (Rel. 7)

HOME USER IDENTITIES SERVICES NETWORK CONFIGURATION STATISTICS

Services

- Service Profiles
  Search
  Create
- Application Servers
  Search
  Create
- Trigger Points
  Search
  Create
- Initial Filter Criteria
  Search
  Create
- Shared iFC Sets
  Search
  Create

ID	Name	Condition Type CNF
1	default_tp	Conjunctive Normal Format
2	ASMode	Disjunctive Normal Format
3	VMProfile	Disjunctive Normal Format
4	XSMode	Disjunctive Normal Format
5	openmind-MASORIG	Conjunctive Normal Format
6	openmind-MASTERM	Conjunctive Normal Format
7	openmind-options-orig	Conjunctive Normal Format
8	openmind-options-term	Conjunctive Normal Format
9	openmind-groupchat	Conjunctive Normal Format
10	openmind-thirdpartyreg	Conjunctive Normal Format

RCS Test Cases and Use Cases

A basic RCS test will comprise of a subscriber powering on a handset, auto-configuring the client and registration to the RCS capable IMS network and polling the address book to discover capabilities of the registered contacts. High level summary of use cases are explained below:

- Auto configuration, registration and discovery
- Enhanced conversation based UI with integrated RCS and SMS messaging
- 1 to 1 chat with picture sharing, delivery notification, emoji and is-typing support
- Joyn –to –Joyn call (voice)
- Joyn – to-Joyn –Video call
- Group chat with picture sharing, delivery notification, emoji and is-typing support
- Network store and forward – for subscribers that go offline in middle of a chat/conversation (applicable to 1-1 chat as well as Group chat)

#	Scenario	Test Case Description	Result
1	**First time Auto Configuration**	Power on handset, auto connect to ACS and register to the IMS/RCS network	Pass
2	**Registration Refresh**	Previously active RCS registration on handset should be refreshed successfully and user can continue to access RCS services	Pass
3	**Auto configuration from invalid user**	Phone/SIM pair that has not been previously configured, when making attempt to connect to ACS fails	Pass
4	**Address Book – RCS User discovery**	RCS enabled user phone goes through address book and polls contacts that are RCS capable (OPTIONS/200OK exchange)	Pass
5	**File transfer – One to many**	RCS user A sends a file to more than one contact simultaneously, all users receive the file	Pass
6	**File transfer Store and forward - DA offline**	RCS user A and B are registered. User A attempts to send files to user B which goes offline during file transfer process. User B receives file when it comes back online.	Pass
7	**File transfer Store and forward – OA interrupted**	RCS user A which is registered, browses/selects file to transfer, however loses Wi-Fi/mobile connection during upload. After Wi-Fi/mobile connection is resumed, file transfer is successful and User B receives the file successfully.	Pass
8	**Image share during voice call**	User A and B registered, are in conversation with an active voice call. User A shares an image with user B, and image sharing/transfer is successful	Pass
9	**Video share during voice call**	User A and B registered, are in conversation with an active voice call. User A selects RCS user B to share video (from list of video files	Pass

		or live camera), and video sharing via RCS is successful	
10	**1-2-1 chat**	User A and User B are registered, user A selects user B and invites for chat. Several messages are exchanged, along with emoticons and 'is typing' notifications	Pass
11	**1-2-1 chat Store and forward**	RCS User A starts to send chat messages to user B which goes offline and sometime passes so that the chat session expires. User A gets notification that messages will be differed. User B receives all messages when it comes back online	Pass
12	**1-2-1 chat Store and forward – unanswered chat**	RCS User A starts to chat with user B and sends a few messages. User B does not open chat window, User A stops sending messages and chat session expires after few minutes. User B opens chat window and gets the messages delivered	Pass
13	**Group Chat**	User A, B, C (and more) registered. User A invites user B and to chat with a group name/subject, sends a few messages and then invites user D as well. All users receive/send chat messages in the group	Pass
14	**Group Chat Store and forward - Basic**	User A, B and C are engaged in a chat conversation. User C loses Wi-Fi/mobile connection and goes offline while chat conversation is ongoing in the group. When it comes back online, it receives the messages	Pass
15	**Group Chat Store and forward – Full**	User A, B are registered while User C is not. User A and B setup group chat inviting user C as well, and exchange messages. User C registers later and receives all the previous chat messages when it joins. User A, B and C continue chatting	Pass
16	**IP Voice Call**	User A selects User B from contact list and places IP voice call	Pass
17	**IP Video Call**	User A selects User B from contact list and places IP video call to user B, both users are able to view/share video	Pass
18	**Resiliency**	Remove Openmind Traffic control Node 1 from the cluster and demonstrate RCS functionality	Pass

Summary and Conclusion

No. of Test Cases	Attempted	Pass	Fail	N/S, N/T
18	18	18	0	0

The integration between Oracle USM and Openmind Networks MAS was completed successfully. No open issues reported.

Appendix A – USM Configuration

```
RCS-USM# show running-config
home-subscriber-server
        name                            openims-bedford
        state                           enabled
        address                         90.90.90.48
        port                            3868
        realm                           for-hss
        origin-host-identifier          pe-usm-omn
        origin-realm                    for-hss
        destination-host-identifier
        watchdog-ka-timer               0
        last-modified-by                admin@172.18.0.158
        last-modified-date              2014-08-27 16:55:38
ifc-profile
        name                            for-bedfordomn
        state                           enabled
        default-ifc-filename
        shared-ifc-filename
        last-modified-by                admin@90.90.90.48
        last-modified-date              2014-09-12 11:56:08
local-response-map
        last-modified-by                admin@10.0.220.11
        last-modified-date              2011-11-04 19:59:01
        entries
                        cx-failure -> sip(480) -> q850(0)
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                  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         10000000
```

```
                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
                syslog-on-demote-to-deny       disabled
                syslog-on-demote-to-untrusted  disabled
                syslog-on-call-reject          disabled
                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
                last-modified-by               admin@172.18.0.119
                last-modified-date             2013-08-07 15:17:59
        media-profile
                name                           PCMU
                subname
                media-type                     audio
                payload-type                   0
                transport                      RTP/AVP
                req-bandwidth                  64
                frames-per-packet              0
                parameters
                average-rate-limit             12000
                peak-rate-limit                0
                max-burst-size                 0
                sdp-rate-limit-headroom        0
                sdp-bandwidth                  disabled
                police-rate                    0
                standard-pkt-rate              0
                last-modified-by               admin@10.0.222.129
                last-modified-date             2012-02-29 15:44:30
        media-profile
                name                           G729
                subname
                media-type                     audio
                payload-type                   18
                transport                      RTP/AVP
                req-bandwidth                  8
                frames-per-packet              0
                parameters
                average-rate-limit             4800
```

```
                peak-rate-limit                 0
                max-burst-size                  0
                sdp-rate-limit-headroom         0
                sdp-bandwidth                   disabled
                police-rate                     0
                standard-pkt-rate               0
                last-modified-by                admin@10.0.222.129
                last-modified-date              2012-02-29 15:44:44
        media-profile
                name                            PCMA
                subname
                media-type                      audio
                payload-type                    8
                transport                       RTP/AVP
                req-bandwidth                   70
                frames-per-packet               0
                parameters
                average-rate-limit              14000
                peak-rate-limit                 0
                max-burst-size                  0
                sdp-rate-limit-headroom         0
                sdp-bandwidth                   disabled
                police-rate                     0
                standard-pkt-rate               0
                last-modified-by                admin@10.0.222.129
                last-modified-date              2012-02-29 15:44:55
        media-profile
                name                            H264
                subname
                media-type                      video
                payload-type                    109
                transport                       RTP/AVP
                req-bandwidth                   2300
                frames-per-packet               0
                parameters
                average-rate-limit              60000
                peak-rate-limit                 0
                max-burst-size                  0
                sdp-rate-limit-headroom         0
                sdp-bandwidth                   disabled
                police-rate                     0
                standard-pkt-rate               0
                last-modified-by                admin@10.0.222.129
                last-modified-date              2012-02-29 15:45:08
        network-interface
                name                            M00
                sub-port-id                     0
                description                                 USM Access interface for
```

```
        oacs.o14s.com
                hostname
                ip-address                      167.1.1.167
                pri-utility-addr
                sec-utility-addr
                netmask                         255.255.255.0
                gateway                         167.1.1.1
                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                     167.1.1.155
                                                167.1.1.167
                ftp-address
                icmp-address
                snmp-address
                telnet-address
                ssh-address
                signaling-mtu                   0
        network-interface
                name                            M11
                sub-port-id                     0
                description                     ISC interface to PE openmind
                hostname
                ip-address                      90.90.90.45
                pri-utility-addr
                sec-utility-addr
                netmask                         255.255.255.0
                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                     90.90.90.45
                ftp-address                     90.90.90.45
                icmp-address                    90.90.90.45
                snmp-address
                telnet-address                  90.90.90.45
                ssh-address                     90.90.90.45
                signaling-mtu                   0
                last-modified-by                admin@172.18.0.158
                last-modified-date              2014-08-27 17:07:44
        phy-interface
                name                            M00
                operation-type                  Media
                port                            0
                slot                            0
                virtual-mac
                admin-state                     enabled
                auto-negotiation                enabled
                duplex-mode                     FULL
                speed                           100
                overload-protection             disabled
                last-modified-by                admin@console
                last-modified-date              2011-07-14 18:31:28
        phy-interface
                name                            M11
                operation-type                  Media
                port                            1
                slot                            1
                virtual-mac
                admin-state                     enabled
                auto-negotiation                enabled
                duplex-mode                     FULL
                speed                           100
                overload-protection             disabled
                last-modified-by                admin@console
                last-modified-date              2011-07-14 20:27:31
        realm-config
                identifier                      access
                description                     for oacs.o14s.com PE
                addr-prefix                     0.0.0.0
                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           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
                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
                deny-period                     30
                cac-failure-threshold           0
                untrust-cac-failure-threshold   0
                ext-policy-svr
                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
                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
                sip-isup-profile
                session-recording-server
                session-recording-required      disabled
                block-rtcp                      disabled
                hide-egress-media-update        disabled
                monitoring-filters
                last-modified-by                admin@90.90.90.48
                last-modified-date              2014-02-12 21:11:13
        realm-config
                identifier                      pe-openmind-rcs
                description
                addr-prefix                     0.0.0.0
                network-interfaces
                                                M11:0
                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           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
                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
                deny-period                    30
                cac-failure-threshold          0
                untrust-cac-failure-threshold  0
                ext-policy-svr
                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
                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
                sip-isup-profile
                session-recording-server
                session-recording-required      disabled
                block-rtcp                      disabled
                hide-egress-media-update        disabled
                monitoring-filters
                last-modified-by                admin@90.90.90.48
                last-modified-date              2014-02-12 21:35:20
        realm-config
                identifier                      for-hss
                description
                addr-prefix                     0.0.0.0
                network-interfaces
                                                M11:0
                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
                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
                deny-period                     30
                cac-failure-threshold           0
                untrust-cac-failure-threshold   0
                ext-policy-svr
                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
                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
                sip-isup-profile
                session-recording-server
                session-recording-required     disabled
                block-rtcp                     disabled
                hide-egress-media-update       disabled
                monitoring-filters
        regevent-notification-profile
                name                           bedford-omn
                min-subscription-duration      1800
                last-modified-by               admin@90.90.90.48
                last-modified-date             2014-02-12 21:57:42
        session-agent
                hostname                       percsmas.o14s.com
                ip-address                     90.90.90.50
                port                           5060
                state                          enabled
                app-protocol                   SIP
                app-type
                transport-method               UDP
                realm-id                       pe-openmind-as
                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
                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
                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
                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
                monitoring-filters
                session-recording-server
                session-recording-required      disabled
        sip-authentication-profile
                name                            auth-pe
                methods                         REGISTER
                anonymous-methods
                digest-realm                    apktbedfordrcs.com
```

```
                credential-retrieval-method    cx
                credential-retrieval-config    openims-bedford
                last-modified-by               admin@90.90.90.48
                last-modified-date             2014-09-12 11:41:51
        sip-config
                state                          enabled
                operation-mode                 dialog
                dialog-transparency            disabled
                home-realm-id                  pe-openmind-rcs
                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
                sip-message-len                4096
                enum-sag-match                 disabled
                extra-method-stats             disabled
                rph-feature                    disabled
                nsep-user-sessions-rate        0
                nsep-sa-sessions-rate          0
                registration-cache-limit       0
                register-use-to-for-lp         disabled
                options                        force-unregistration
                                               global-contact
                                               max-udp-length=0
                                               pai-comply-to-3gpp
                refer-src-routing              disabled
                add-ucid-header                disabled
```

```
                proxy-sub-events
                allow-pani-for-trusted-only    disabled
                pass-gruu-contact              disabled
                sag-lookup-on-redirect         disabled
                set-disconnect-time-on-bye     disabled
                last-modified-by               admin@90.90.90.48
                last-modified-date             2014-02-12 21:38:35
        sip-feature
                name                           eventlist
                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@172.18.0.103
                last-modified-date             2013-08-09 12:40:27
        sip-feature
                name                           recipient-list-invite
                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@172.18.0.103
                last-modified-date             2013-08-09 12:41:17
        sip-interface
                state                          enabled
                realm-id                       access
                description
                sip-port
                        address                        167.1.1.155
                        port                           5060
                        transport-protocol             UDP
                        tls-profile
                        multi-home-addrs
                        allow-anonymous                registered
                        ims-aka-profile
                sip-port
                        address                        167.1.1.155
                        port                           5060
                        transport-protocol             TCP
                        tls-profile
                        multi-home-addrs
                        allow-anonymous                registered
```

```
                ims-aka-profile
              carriers
              trans-expire                    0
              invite-expire                   0
              max-redirect-contacts           0
              proxy-mode
              redirect-action
              contact-mode                    none
              nat-traversal                   always
              nat-interval                    60
              tcp-nat-interval                90
              registration-caching            enabled
              min-reg-expire                  300
              registration-interval           3600
              route-to-registrar              enabled
              secured-network                 disabled
              teluri-scheme                   disabled
              uri-fqdn-domain
              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-string
              manipulation-pattern
              ims-access                      enabled
              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                      apktbedfordrcs.com
              ext-policy-server
              default-location-string
              charging-vector-mode            pass
              charging-function-address-mode  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
                unregister-on-connection-loss   disabled
                tunnel-name
                sip-authentication-profile      auth-pe
                session-recording-server
                session-recording-required      disabled
                ping-response                   disabled
        sip-interface
                state                           enabled
                realm-id                        pe-openmind-as
                description
                sip-port
                        address                         90.90.90.45
                        port                            5080
                        transport-protocol              UDP
                        tls-profile
                        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
                secured-network                 disabled
```

```
                teluri-scheme                   disabled
                uri-fqdn-domain
                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               addASU
                out-manipulationid
                manipulation-string
                manipulation-pattern
                ims-access                      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
                ext-policy-server
                default-location-string
                charging-vector-mode            pass
                charging-function-address-mode  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
                unregister-on-connection-loss   disabled
```

```
                tunnel-name
                sip-authentication-profile
                session-recording-server
                session-recording-required     disabled
                ping-response                  disabled
        sip-manipulation
                name                           addASU
                description                       Add Acme user header for Store and
        Forward openmind
                split-headers
                join-headers
                header-rule
                        name                           PSUexists
                        header-name                    P-Served-User
                        action                         store
                        comparison-type                pattern-rule
                        msg-type                       any
                        methods                        INVITE
                        match-value
                        new-value
                header-rule
                        name                           addASU
                        header-name                    @acme-served-user
                        action                         add
                        comparison-type                boolean
                        msg-type                       any
                        methods
                        match-value                    $PSUexists
                        new-value                      $PSUexists.$0
                last-modified-by               admin@90.90.90.48
                last-modified-date             2014-09-19 08:00:22
        sip-registrar
                name                           apktbedfordreg
                state                          enabled
                domains                        apktbedfordrcs.com
                subscriber-database-method     CX
                subscriber-database-config     openims-bedford
                authentication-profile         auth-pe
                home-server-route              sip:90.90.90.45:5080
                third-party-registrars
                routing-precedence             REGISTRAR
                egress-realm-id                pe-aws-enum
                location-update-interval       1440
                ifc-profile                    for-bedfordomn
                max-contacts-per-aor           0
                regevent-notification-profile  bedford-omn
                last-modified-by               admin@90.90.90.48
                last-modified-date             2014-09-12 11:40:29
```

```
        static-flow
                in-realm-id                     access
                description                     for ACS http flow
                in-source                       0.0.0.0
                in-destination                  167.1.1.155:80
                out-realm-id                    pe-openmind-as
                out-source                      90.90.90.45
                out-destination                 90.90.90.50:80
                protocol                        TCP
                alg-type                        NAPT
                start-port                      3000
                end-port                        3100
                flow-time-limit                 0
                initial-guard-timer             60
                subsq-guard-timer               60
                average-rate-limit              0
                last-modified-by                admin@172.18.0.136
                last-modified-date              2014-08-28 09:57:22
        static-flow
                in-realm-id                     access
                description                     for https ACS flow
                in-source                       0.0.0.0
                in-destination                  167.1.1.155:443
                out-realm-id                    pe-openmind-as
                out-source                      90.90.90.45
                out-destination                 90.90.90.50:443
                protocol                        TCP
                alg-type                        NAPT
                start-port                      4000
                end-port                        4100
                flow-time-limit                 0
                initial-guard-timer             60
                subsq-guard-timer               60
                average-rate-limit              0
                last-modified-by                admin@172.18.0.136
                last-modified-date              2014-08-28 11:37:11
        static-flow
                in-realm-id                     access
                description                     for HTTP FT
                in-source                       0.0.0.0
                in-destination                  167.1.1.155:55000
                out-realm-id                    pe-openmind-as
                out-source                      90.90.90.45
                out-destination                 90.90.90.50:55000
                protocol                        TCP
                alg-type                        NAPT
                start-port                      6000
                end-port                        6100
```

```
                flow-time-limit                 0
                initial-guard-timer             60
                subsq-guard-timer               60
                average-rate-limit              0
                last-modified-by                admin@172.18.0.136
                last-modified-date              2014-08-28 11:40:45
        static-flow
                in-realm-id                     pe-openmind-as
                description                     for SMS code
                in-source                       90.90.90.50
                in-destination                  90.90.90.45:42775
                out-realm-id                    access
                out-source                      167.1.1.155
                out-destination                 83.71.251.185:42775
                protocol                        TCP
                alg-type                        NAPT
                start-port                      7000
                end-port                        7100
                flow-time-limit                 0
                initial-guard-timer             60
                subsq-guard-timer               60
                average-rate-limit              0
                last-modified-by                admin@172.18.0.136
                last-modified-date              2014-08-28 12:12:08
        steering-pool
                ip-address                      167.1.1.167
                start-port                      20000
                end-port                        20100
                realm-id                        access
                network-interface
                last-modified-by                admin@90.90.90.48
                last-modified-date              2014-02-14 16:22:41
        steering-pool
                ip-address                      90.90.90.45
                start-port                      30000
                end-port                        30100
                realm-id                        pe-openmind-as
                network-interface
                last-modified-by                admin@90.90.90.48
                last-modified-date              2014-02-14 16:24:15
        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                NOTICE
                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
                call-trace                      enabled
                internal-trace                  enabled
                log-filter                      all
                default-gateway                 172.18.0.1
                restart                         disabled
                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-lifetime             0
                ids-syslog-facility             -1
                default-v6-gateway              0.0.0.0
                ipv6-signaling-mtu              1500
                ipv4-signaling-mtu              1500
                cleanup-time-of-day             00:00
                snmp-engine-id-suffix
                snmp-agent-mode                 v1v2
                comm-monitor
                        state                           enabled
                        qos-enable                      enabled
                        sbc-grp-id                      0
```

```
                        tls-profile
                        monitor-collector
                                address                         172.18.255.112
                                port                            4739
                                network-interface               wancom0:0
```

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