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Oracle Enterprise Session Border Controller
and Alcatel Lucent OXE with Completel (SFR)
SIP trunk

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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 Enterprise Session Border Controller (E-SBC). It assumes that the reader is familiar with basic operations of the Oracle Enterprise Session Border Controller.

Document Overview

Interactive Intelligence offers the ability to connect to Internet telephony service providers (ITSP) using an IP-based SIP trunk. This reduces the cost and complexity of extending an enterprise's telephony system outside its network borders. Oracle Enterprise Session Border Controllers (E-SBCs) play an important role in SIP trunking as they are used by many ITSPs and some enterprises as part of their SIP trunking infrastructure.

This application note has been prepared as a means of ensuring that SIP trunking between ALU OXE, Oracle E-SBCs and IP Trunking services are configured in the optimal manner.

Introduction

Audience

This is a technical document intended for telecommunications engineers with the purpose of configuring the Oracle Enterprise Session Border Controller and ALU OXE CIC. There will be steps that require navigating the Command Line Interface (ACLI). Understanding the basic concepts of TCP/UDP, IP/Routing, SIP/RTP, TLS and SRTP are also necessary to complete the configuration and for troubleshooting, if necessary.

Requirements

- Alcatel Lucent OXE version R11.2.1-l2.300-29-b-fr-c0
- Oracle Enterprise Session Border Controller is running Acme Packet VME ECZ7.3.0 MR-2 Patch 1
    - o Note: the configuration running on the E-SBC is backward/forward compatible with any release in the 7.3.0 & above stream.

	Equipment	Version
IP PBX	Alcatel OXE	R11.2.1-l2.300-29-b-fr-c0
Media Gateway	Alcatel GD3	
Carrier	Cirpack V4.56	R18
Oracle	AP VME SBC	ECZ7.3.0 MR-2 Patch 1
Phones	Alcatel IP Touch 4068	4.33.40
	Alcatel IP Touch 4028	4.33.40
FAX	Analog Fax G3	

Architecture

The following reference architecture shows a logical view of the connectivity
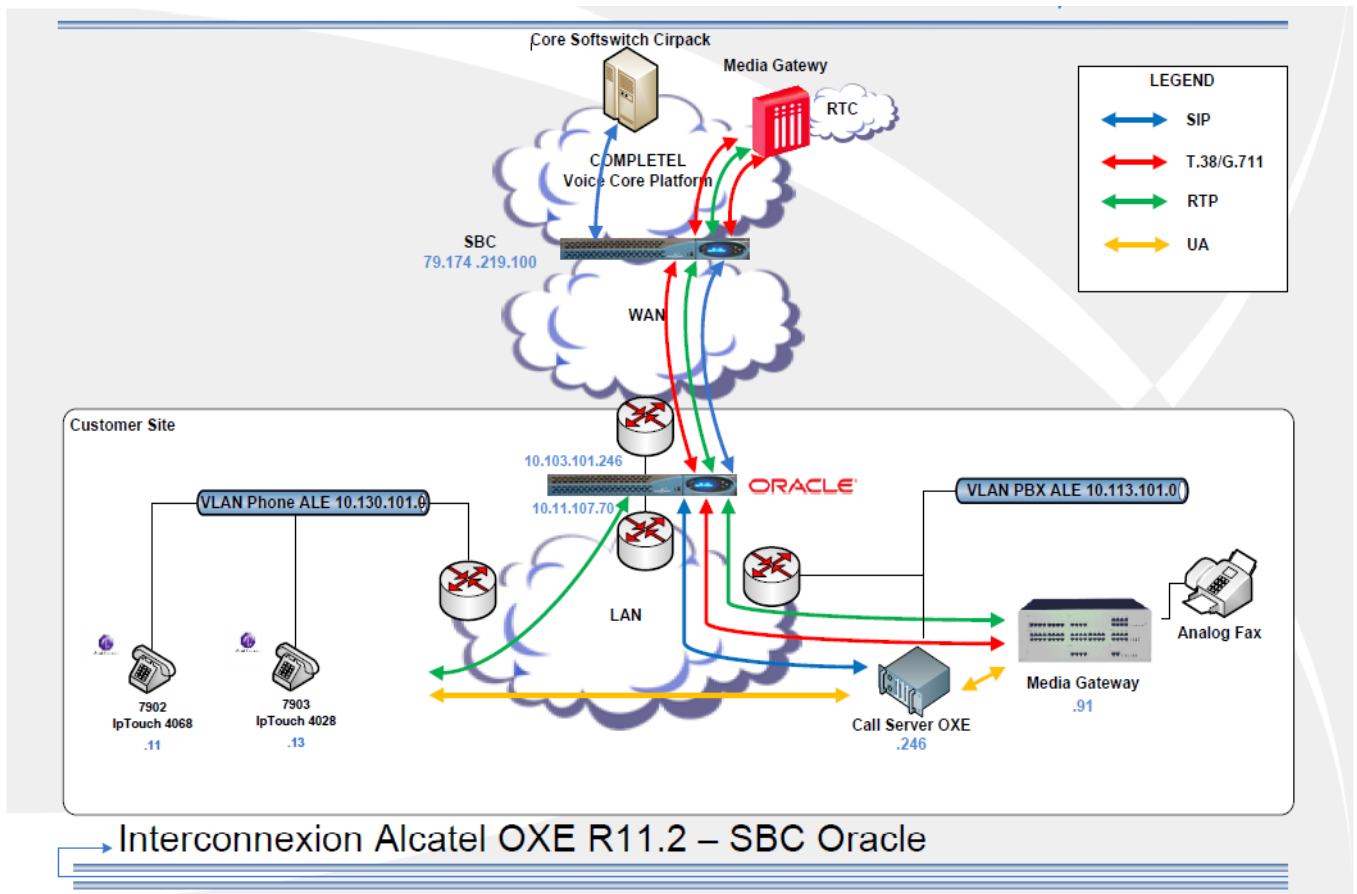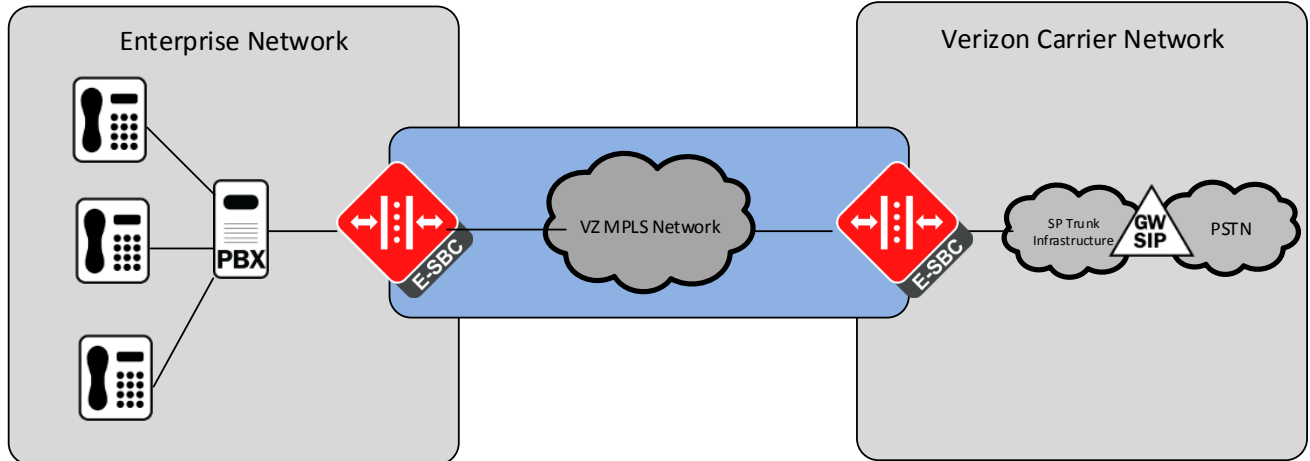
Figure 1 - Schema of the test environment for the test and validation of Alcatel OXE with Oracle SBC

Lab Configuration

Following are the IP addresses used for the Interoperability tests. The IPs below are specific to lab setup at Completely, the IPs in production will be vastly different from network addresses listed below.

description	network-interface	realm	interface IP	sip-port
SBC interfaces				
management	wancom0		10.0.107.37	
redundancy	wancom1		10.0.0.1	
redundancy	wancom2		10.0.1.1	
media/signaling	s0p0:0	SP	10.103.101.246	5060
media/signaling	s1p0:0	ENT	10.11.107.70	5060
Session-Agents				
Alcatel-Lucent Entreprise OXE			10.113.101.246	5060
Alcatel-Lucent Entreprise Media Gateway			10.113.101.91	5060
Completel SBC			46.218.190.55	5060
AP VME			10.103.101.246 (outside)	
			10.11.107.70 (inside)	
Phones	Alcatel IP Touch 4068		10.130.101.11	
	Alcatel IP Touch 4028		10.130.101.13	

Network prerequisites

SBC Oracle:
The Oracle SBC needs 2 network interfaces:
- The first one (WAN interface): must have an IP that can communicate with the carrier network.
- The second (LAN interface): must have an IP that can communicate with the IP PBX.

Alcatel OXE:
• Alcatel OXE must be synchronize to a secure NTP source.
• IP Phones must be synchronized on the same secure NTP source.

SIP trunk registration:
• Completel communicates the login, password and IP address for the SIP trunk registration.
• The SIP registration must be done on the Oracle E-SBC using the surrogate agent feature.

Configuring the Oracle Enterprise Session Border Controller

In this section we describe the steps for configuring an Oracle Enterprise Session Border Controller, formally known as an Acme Packet Net-Net Enterprise Session Director, for use with CIC Server in a SIP trunking scenario.

In Scope

The following guide configuring the Oracle E-SBC assumes that this is a newly deployed device dedicated to a single customer. If a service provider currently has the E-SBC deployed then please see the ACLI Configuration Guide on http://docs.oracle.com/cd/E56581_01/index.htm for a better understanding of the Command Line Interface (CLI).

> Note that Oracle offers several models of E-SBC. This document covers the setup for the E-SBC platform running ECZ7.3.0 or later. If instructions are needed for other Oracle E-SBC models, please contact your Oracle representative.

Out of Scope

- Configuration of Network management including SNMP and RADIUS

What will you need

- Hypervisor with console connectivity through the hypervisor
- Terminal emulation application such as PuTTY or HyperTerm
- Passwords for the User and Super user modes on the Oracle E-SBC
- IP address to be assigned to management interface (Wancom0) of the E-SBC - the Wancom0 management interface must be connected and configured to a management network separate from the service interfaces. Otherwise the E-SBC is subject to ARP overlap issues, loss of system access when the network is down, and compromising DDoS protection. Oracle does not support E-SBC configurations with management and media/service interfaces on the same subnet.
- IP address of CIC external facing NIC
- IP addresses to be used for the E-SBC internal and external facing ports (Service Interfaces)
- IP address of the next hop gateway in the service provider network

Configuring the E-SBC

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

```
Password: acme
SBC1> enable
Password: packet
SBC1# configure terminal
SBC1 (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 E-SBC by going to

SBC1#**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

```
SBC1#(configure)bootparam
'.' = clear field;  '-' = go to previous field;       q = quit boot device            : eth0
processor number      : 0
host name        : acmesystem
file name         : /code/images/nnECZ730m2p1.bz --- >location where the software is loaded on the SBC
inet on ethernet (e)     : 10.0.107.37:ffffff80 --- > This is the ip address of the management interface of the
                     SBC, type the IP address and mask in hex
inet on backplane (b)   :
host inet (h)     :
gateway inet (g)         : 10.0.107.1->
gateway address here user (u) : vxftp
ftp password (pw) (blank = use rsh)    : vxftp
flags (f)            :
target name (tn)        : SBC1 -> ACLI prompt name & HA peer name
startup script (s)       :
other (o)         :
```

The following section walks you through configuring the Oracle E-SBC. It is outside the scope of this document to include all of the configuration elements as it will differ in every deployment.

Physical Interface:

```
phy-interface
    name                    ENT
    operation-type              Media
    port                  0
    slot                  1
    virtual-mac               00:50:56:bd:00:1f
    admin-state              enabled
    auto-negotiation              enabled
    duplex-mode
    speed
    wancom-health-score            50
    overload-protection          disabled
    last-modified-by
    last-modified-date            2017-04-04 15:55:15
phy-interface
    name                    SP
    operation-type              Media
    port                  0
    slot                  0
    virtual-mac               00:50:56:bd:00:0f
    admin-state              enabled
    auto-negotiation              enabled
    duplex-mode              FULL
    speed                100
    wancom-health-score            50
    overload-protection          disabled
    last-modified-by
    last-modified-date            2017-04-04 15:55:02
phy-interface
    name                    wancom1
    operation-type              Control
    port                  1
    slot                  0
    virtual-mac
    admin-state              enabled
    auto-negotiation              enabled
```

```
       duplex-mode
       speed
       wancom-health-score            20
       overload-protection           disabled
       last-modified-by              admin@172.16.120.7
       last-modified-date            2017-04-04 16:45:01
phy-interface
       name                  wancom2
       operation-type            Control
       port              2
       slot              0
       virtual-mac
       admin-state               enabled
       auto-negotiation          enabled
       duplex-mode
       speed
       wancom-health-score            20
       overload-protection           disabled
       last-modified-by
       last-modified-date            2017-04-04 16:45:08
```

High Availability

For additional information on High Availability please see the enterprise SBC documentation for more information (http://www.oracle.com/technetwork/indexes/documentation/oracle-comms-acme-packet-2046907.html)

Interfaces wancom1 and 2 need to be added to facilitate HA communication between the two HA pairs.

```
 network-interface
     name                  wancom1
     sub-port-id               0
     description
     hostname
     ip-address
     pri-utility-addr          10.0.0.1
     sec-utility-addr          10.0.0.2
     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
    signaling-mtu          0
    hip-ip-list
    ftp-address
    icmp-address
    snmp-address
    telnet-address
    ssh-address
    last-modified-by
    last-modified-date        2017-04-04 15:59:02
network-interface
    name              wancom2
    sub-port-id          0
    description
    hostname
    ip-address
    pri-utility-addr        10.0.1.1
    sec-utility-addr        10.0.1.2
    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
    signaling-mtu          0
    hip-ip-list
```

```
    ftp-address
    icmp-address
    snmp-address
    telnet-address
    ssh-address
    last-modified-by
    last-modified-date          2017-04-04 15:59:23
```

```
redundancy-config
    state               enabled
    log-level             INFO
    health-threshold          75
    emergency-threshold          50
    port              9090
    advertisement-time          500
    percent-drift          210
    initial-time          1250
    becoming-standby-time          180000
    becoming-active-time          100
    cfg-port          1987
    cfg-max-trans          10000
    cfg-sync-start-time          5000
    cfg-sync-comp-time          1000
    gateway-heartbeat-interval       0
    gateway-heartbeat-retry       0
    gateway-heartbeat-timeout       1
    gateway-heartbeat-health       0
    media-if-peercheck-time       0
    peer
        name               osbc1
        state               enabled
        type               Primary
        destination
            address               10.0.0.1:9090
            network-interface          wancom1:0
        destination
            address               10.0.1.1:9090
            network-interface          wancom2:0
    peer
        name               osbc2
        state               enabled
        type               Secondary
```

```
        destination
            address                 10.0.0.2:9090
            network-interface           wancom1:0
        destination
            address                 10.0.1.2:9090
            network-interface           wancom2:0
    last-modified-by
    last-modified-date          2017-04-04 16:01:15
```

Additionally primary and secondary interface IPs need to be added to the media/signaling network-interfaces

```
network-interface
    name                ENT
    sub-port-id             0
    description
    hostname
    ip-address          10.11.107.70
    pri-utility-addr        10.11.107.71
    sec-utility-addr        10.11.107.72
    netmask             255.255.255.0
    gateway             10.11.107.254
    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
    ftp-address
    icmp-address        10.11.107.70
    snmp-address
    telnet-address
    ssh-address
    last-modified-by
```

```
     last-modified-date           2017-04-04 15:36:08
network-interface
     name                SP
     sub-port-id            0
     description
     hostname
     ip-address           10.103.101.246
     pri-utility-addr        10.103.101.247
     sec-utility-addr        10.103.101.248
     netmask             255.255.255.0
     gateway             10.103.101.254
     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
     ftp-address
     icmp-address          10.103.101.246
     snmp-address
     telnet-address
     ssh-address
     last-modified-by
     last-modified-date           2017-04-04 15:36:52
```

Realms

```
realm-config
      identifier               ENT
      description
      addr-prefix              0.0.0.0
      network-interfaces       ENT:0.4
      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
      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
      device-id
      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
        spl-options
        accounting-enable            enabled
        net-management-control        disabled
        delay-media-update           disabled
        refer-call-transfer          disabled
        hold-refer-reinvite          disabled
        refer-notify-provisional        none
        dyn-refer-term               disabled
        codec-policy                 ENT
        codec-manip-in-realm         disabled
        codec-manip-in-network        enabled
        rtcp-policy
        constraint-name
        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           aleoxe
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type               none
        last-modified-by
        last-modified-date           2017-04-05 22:08:34
realm-config
        identifier                  SP
        description
```

```
addr-prefix                      0.0.0.0
network-interfaces               SP:0.4
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
class-profile
in-translationid
out-translationid
in-manipulationid
out-manipulationid
average-rate-limit               0
access-control-trust-level       medium
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
device-id
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
        spl-options
        accounting-enable              enabled
        net-management-control            disabled
        delay-media-update             disabled
        refer-call-transfer           disabled
        hold-refer-reinvite            disabled
        refer-notify-provisional            none
        dyn-refer-term                disabled
        codec-policy               SP
        codec-manip-in-realm             disabled
        codec-manip-in-network             enabled
        rtcp-policy
        constraint-name
        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            completel
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type               none
        last-modified-by
        last-modified-date             2017-04-07 13:42:25
realm-config
        identifier               auth
        description
        addr-prefix               0.0.0.0
        network-interfaces            ENT:0.4
        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
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
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
device-id
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
spl-options
accounting-enable            enabled
net-management-control       disabled
delay-media-update           disabled
refer-call-transfer          disabled
hold-refer-reinvite          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
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
last-modified-date           2017-04-05 09:37:59
```

Enable SIP on the SBC and configure default configuration required on the SBC as follows

SIP Config

```
sip-config
        state                       enabled
        operation-mode              dialog
        dialog-transparency         enabled
        home-realm-id
        egress-realm-id
        auto-realm-id
        nat-mode                    None
        registrar-domain            *
        registrar-host              *
        registrar-port              0
        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                     drain-sendonly
                                    max-udp-length=0
                                    sag-target-uri=ip
                                    set-inv-exp-at-100-resp
        add-reason-header           disabled
        sip-message-len             4096
        enum-sag-match              enabled
        extra-method-stats          disabled
        extra-enum-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
        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
        last-modified-date            2017-04-10 16:00:10
```

Routing via Local Policy

For outbound calls the local-policy determines which trunk to forward the call based on the NPA of the request-URI. This is configured in the local policy of the "To". For most configurations there will be only 1 inside and outside realm. For a single inside/outside realm configuration the local policy to and from would be set to "*". Redundant trunk configurations will use a session-agent group.

```
local-policy
        from-address              *
        to-address              *
        source-realm             ENT
        description
        activate-time
```

```
      deactivate-time
      state                    enabled
      policy-priority              none
      policy-attribute
            next-hop                  siptrunk.voip.completel.fr
            realm                SP
            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
      last-modified-date           2017-04-11 12:26:18
local-policy
      from-address             *
      to-address               *
      source-realm             SP
      description
      activate-time
      deactivate-time
      state                    enabled
      policy-priority              none
      policy-attribute
            next-hop                 10.113.101.246
            realm                ENT
            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
    last-modified-date            2017-04-12 11:34:17
```

Create SIP Feature:

```
sip-feature
     name                  REGISTER
     realm                 ENT
     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
     last-modified-date            2017-04-07 13:01:19
sip-feature
     name                  REGISTER
     realm                 SP
     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
     last-modified-date            2017-04-07 12:14:47
```

Create Surrogate-agent

This configuration is required for the SBC to register to the SIP Trunk on behalf of ALU OXE. OXE doesn't support trunk registration feature and also doesn't support authentication support for 401/407 response for methods such as INVITE, REGISTER & more...

```
surrogate-agent
      register-host                 siptrunk.voip.completel.fr
      register-user                 0973329886
      description                   Credentials for Completel sip trunk
      realm-id              ENT
      state               enabled
      customer-host
      customer-next-hop              46.218.190.55
      register-contact-host          siptrunk.voip.completel.fr
      register-contact-user          1234567890
      password              Password
      register-expires               600
      replace-contact                disabled
      options                auth-info=refresh
                            auth-method="INVITE,CANCEL,ACK,BYE"
      route-to-registrar            enabled
      aor-count              1
      auth-user              0973329886
      max-register-attempts          10
      register-retry-time            300
      count-start            1
      register-mode          automatic
      triggered-inactivity-interval       30
      triggered-oos-response          503
      last-modified-by
      last-modified-date             2017-04-10 18:20:44
```

Session Agent:

```
session-agent
      hostname                 10.113.101.246
      ip-address               10.113.101.246
      port               5060
      state              enabled
      app-protocol              SIP
      app-type
      transport-method              UDP
      realm-id              ENT
      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                OPTIONS
ping-interval              60
ping-send-mode               keep-alive
ping-all-addresses             disabled
ping-in-service-response-codes
out-service-response-codes
load-balance-dns-query             hunt
options
spl-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
        auth-attributes
            auth-realm            siptrunk.voip.completel.fr
            username              0912345678
            password            ********
            in-dialog-methods                INVITE
                                  BYE
                                  ACK
                                  CANCEL
                                  OPTIONS
                                  PRACK
                                  NOTIFY
                                  UPDATE
        session-recording-server
        session-recording-required        disabled
        hold-refer-reinvite            disabled
        send-tcp-fin              disabled
        last-modified-by
        last-modified-date            2017-04-07 14:09:07
session-agent
```

```
hostname                    siptrunk.voip.completel.fr
ip-address                  46.218.190.55
port                   5060
state                  enabled
app-protocol                SIP
app-type
transport-method            UDP
realm-id               SP
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                OPTIONS
ping-interval               600
ping-send-mode              keep-alive
ping-all-addresses          disabled
ping-in-service-response-codes        200,483
out-service-response-codes
load-balance-dns-query            hunt
```

```
options
spl-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        100
early-media-allow
invalidate-registrations         enabled
rfc2833-mode                 transparent
rfc2833-payload              101
codec-policy                SP
enforcement-profile
refer-call-transfer          disabled
refer-notify-provisional         none
reuse-connections            NONE
tcp-keepalive               none
tcp-reconn-interval          0
max-register-burst-rate          100
register-burst-window            0
sip-profile
sip-isup-profile
kpml-interworking            inherit
monitoring-filters           completel
session-recording-server
session-recording-required       disabled
hold-refer-reinvite          disabled
send-tcp-fin                disabled
last-modified-by
last-modified-date               2017-04-11 13:08:00
```

Header manipulation rules

The following HMR updates the host portion of the URI to the Completel trunk IP for Request-URI and To headers. The host portion of the URI is updated with the E-SBC outside sip-interface IP for From, P-Asserted-Identity and Contact so that the E-SBC presents its interface IP to the next hop.

```
sip-manipulation
      name                    fromENT
      description
      split-headers
      join-headers
      header-rule
            name                    callRejectOPTIONS
            header-name                  CSeq
            action                  sip-manip
            comparison-type              case-sensitive
            msg-type                 request
            methods                  OPTIONS
            match-value
            new-value                 rejectOPTIONS
      last-modified-by
      last-modified-date          2017-05-17 13:20:47
sip-manipulation
      name                    fromSP
      description
      split-headers
      join-headers
      header-rule
            name                    callRejectOPTIONS
            header-name                  CSeq
            action                  sip-manip
            comparison-type              case-sensitive
            msg-type                 request
            methods                  OPTIONS
            match-value
            new-value                 rejectOPTIONS
      header-rule
            name                    FromFix
            header-name                  From
            action                  manipulate
            comparison-type              case-sensitive
            msg-type                 any
            methods
            match-value
```

```
        new-value
        element-rule
            name               FixFrom
            parameter-name
            type               uri-host
            action              replace
            match-val-type          fqdn
            comparison-type          case-sensitive
            match-value
            new-value               10.11.107.70
    header-rule
        name               ToFix
        header-name            To
        action             manipulate
        comparison-type          case-sensitive
        msg-type             any
        methods
        match-value
        new-value
        element-rule
            name               FixTo
            parameter-name
            type               uri-host
            action              replace
            match-val-type          fqdn
            comparison-type          case-sensitive
            match-value
            new-value               10.11.107.70
    header-rule
        name               RuriFix
        header-name            request-uri
        action             manipulate
        comparison-type          case-sensitive
        msg-type             request
        methods
        match-value
        new-value
        element-rule
            name               FixRuri
            parameter-name
            type               uri-host
            action              replace
```

```
                match-val-type            ip
                comparison-type             case-sensitive
                match-value
                new-value                 10.113.101.246
        header-rule
            name                fix183
            header-name             From
            action              sip-manip
            comparison-type             case-sensitive
            msg-type                any
            methods
            match-value
            new-value                 stripSdp183
        header-rule
            name                fix180
            header-name             From
            action              sip-manip
            comparison-type             case-sensitive
            msg-type                any
            methods
            match-value
            new-value                 stripSdp180
        last-modified-by
        last-modified-date          2017-05-17 13:39:39
sip-manipulation
        name                rejectOPTIONS
        description         Answers locally OPTIONS requests with 200 OK
        split-headers
        join-headers
        header-rule
            name                HR_RejectOPTIONS
            header-name             From
            action              reject
            comparison-type             case-sensitive
            msg-type                out-of-dialog
            methods                 OPTIONS
            match-value
            new-value                 200:OK
        last-modified-by
        last-modified-date          2017-04-07 09:04:00
sip-manipulation
        name                stripSdp180
```

```
description              For incoming 180 from Completel, strip SDP

split-headers
join-headers
header-rule
     name                check180
     header-name               @status-line
     action               store
     comparison-type            pattern-rule
     msg-type              any
     methods
     match-value
     new-value
     element-rule
          name                is180
          parameter-name               status-code
          type                status-code
          action               store
          match-val-type             any
          comparison-type            pattern-rule
          match-value               180
          new-value
header-rule
     name                delSdp
     header-name               Content-Type
     action               manipulate
     comparison-type            case-insensitive
     msg-type              any
     methods
     match-value               $check180.$is180
     new-value
     element-rule
          name                del180SDP
          parameter-name               application/sdp
          type                mime
          action               delete-element
          match-val-type             any
          comparison-type            boolean
          match-value
          new-value
header-rule
     name                delContentType
```

```
        header-name              Content-Type
        action                   manipulate
        comparison-type              boolean
        msg-type                any
        methods
        match-value                 $check180.$is180
        new-value
        element-rule
            name                 delCT
            parameter-name              *
            type                 header-param
            action                delete-header
            match-val-type            any
            comparison-type              case-sensitive
            match-value
            new-value
    last-modified-by
    last-modified-date            2017-05-17 13:37:23
sip-manipulation
    name                  stripSdp183
    description           For incoming 183 from Completel, strip SDP

    split-headers
    join-headers
    header-rule
        name                 check183
        header-name                @status-line
        action                store
        comparison-type              pattern-rule
        msg-type                any
        methods
        match-value
        new-value
        element-rule
            name                 is183
            parameter-name               status-code
            type                 status-code
            action                store
            match-val-type            any
            comparison-type              pattern-rule
            match-value              183
            new-value
```

```
header-rule
    name                delSdp
    header-name             Content-Type
    action              manipulate
    comparison-type             case-insensitive
    msg-type            any
    methods
    match-value             $check183.$is183
    new-value
    element-rule
        name                del183SDP
        parameter-name              application/sdp
        type                mime
        action              delete-element
        match-val-type          any
        comparison-type             boolean
        match-value
        new-value
header-rule
    name                delContentType
    header-name             Content-Type
    action              manipulate
    comparison-type             boolean
    msg-type            any
    methods
    match-value             $check183.$is183
    new-value
    element-rule
        name                delCT
        parameter-name              *
        type                header-param
        action              delete-header
        match-val-type          any
        comparison-type             case-sensitive
        match-value
        new-value
    last-modified-by
    last-modified-date          2017-05-17 13:32:53
sip-manipulation
    name                toSP
    description                     Basic topology hiding manipulation.
    split-headers
```

```
join-headers
header-rule
    name                FromFix
    header-name             From
    action              manipulate
    comparison-type             case-sensitive
    msg-type            any
    methods
    match-value
    new-value
    element-rule
        name                FixUriHost
        parameter-name
        type            uri-host
        action              replace
        match-val-type              ip
        comparison-type             case-sensitive
        match-value
        new-value               $LOCAL_IP
header-rule
    name                ToFix
    header-name             To
    action              manipulate
    comparison-type             case-sensitive
    msg-type            any
    methods
    match-value
    new-value
    element-rule
        name                FixUriHost
        parameter-name
        type            uri-host
        action              replace
        match-val-type              ip
        comparison-type             case-sensitive
        match-value
        new-value               $REMOTE_IP
header-rule
    name                PAIFix
    header-name             P-Asserted-Identity
    action              manipulate
    comparison-type             case-sensitive
```

```
        msg-type              any
        methods
        match-value
        new-value
        element-rule
            name               FixUriHost
            parameter-name
            type               uri-host
            action              replace
            match-val-type         ip
            comparison-type         case-sensitive
            match-value
            new-value              $LOCAL_IP
    header-rule
        name                FixRuri
        header-name           request-uri
        action             manipulate
        comparison-type         case-sensitive
        msg-type              any
        methods
        match-value
        new-value
        element-rule
            name               RuriFix
            parameter-name
            type               uri-host
            action              replace
            match-val-type         ip
            comparison-type         case-sensitive
            match-value
            new-value              siptrunk.voip.completel.fr
    last-modified-by
    last-modified-date         2017-04-10 18:11:32
```

SIP interface

```
sip-interface
    state              enabled
    realm-id            ENT
    description
    sip-port
        address            10.11.107.70
```

```
        port                    5060
            transport-protocol              UDP
            tls-profile
            allow-anonymous             agents-only
            multi-home-addrs
            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           none
        nat-interval            60
        tcp-nat-interval            90
        registration-caching            enabled
        min-reg-expire          300
        registration-interval          3600
        route-to-registrar          disabled
        secured-network             disabled
        teluri-scheme           disabled
        uri-fqdn-domain
        options
        spl-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           fromENT
        out-manipulationid
        sip-ims-feature         disabled
        sip-atcf-feature        disabled
        subscribe-reg-event         enabled
        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
ldap-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               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-bye           disabled
send-380-response
pcscf-restoration
session-timer-profile
session-recording-server
session-recording-required        disabled
service-tag
```

```
        reg-cache-route              disabled
        last-modified-by
        last-modified-date              2017-04-11 13:07:34
sip-interface
        state                  enabled
        realm-id                SP
        description
        sip-port
            address                10.103.101.246
            port                5060
            transport-protocol              UDP
            tls-profile
            allow-anonymous              agents-only
            multi-home-addrs
            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              none
        nat-interval              60
        tcp-nat-interval              90
        registration-caching          enabled
        min-reg-expire              300
        registration-interval          3600
        route-to-registrar          disabled
        secured-network              disabled
        teluri-scheme              disabled
        uri-fqdn-domain
        options              early-media-sdp-realms
        spl-options
        trust-mode              agents-only
        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                  fromSP
out-manipulationid                 toSP
sip-ims-feature                    disabled
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
ext-policy-server
ldap-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                  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-bye             disabled
        send-380-response
        pcscf-restoration
        session-timer-profile
        session-recording-server
        session-recording-required        disabled
        service-tag
        reg-cache-route              disabled
        last-modified-by
      last-modified-date           2017-04-11 13:08:12
```

Configure Access Control

Access Controls are required on the SBC to allow/restrict/block certain type of traffic:

```
access-control
    realm-id                SP
    description
    source-address          0.0.0.0
    destination-address         10.103.101.246
    application-protocol        SIP
    transport-protocol          ALL
    access                  permit
    average-rate-limit          0
    trust-level             high
    minimum-reserved-bandwidth      0
    invalid-signal-threshold        0
    maximum-signal-threshold        0
    untrusted-signal-threshold      0
    deny-period             30
    nat-trust-threshold         0
    max-endpoints-per-nat           0
    nat-invalid-message-threshold       0
    cac-failure-threshold           0
    untrust-cac-failure-threshold       0
    last-modified-by
    last-modified-date          2017-04-10 17:46:05
access-control
    realm-id                ENT
    description
    source-address          10.113.101.246
    destination-address         10.11.107.70
    application-protocol        SIP
    transport-protocol          UDP
```

```
        access                    permit
        average-rate-limit              0
        trust-level               high
        minimum-reserved-bandwidth        0
        invalid-signal-threshold          0
        maximum-signal-threshold            0
        untrusted-signal-threshold         0
        deny-period               30
        nat-trust-threshold            0
        max-endpoints-per-nat           0
        nat-invalid-message-threshold       0
        cac-failure-threshold           0
        untrust-cac-failure-threshold       0
        last-modified-by
        last-modified-date            2017-04-05 18:53:26
access-control
        realm-id                ENT
        description
        source-address            10.113.101.247
        destination-address           10.11.107.70
        application-protocol          SIP
        transport-protocol           UDP
        access                    permit
        average-rate-limit              0
        trust-level               high
        minimum-reserved-bandwidth        0
        invalid-signal-threshold          0
        maximum-signal-threshold            0
        untrusted-signal-threshold         0
        deny-period               30
        nat-trust-threshold            0
        max-endpoints-per-nat           0
        nat-invalid-message-threshold       0
        cac-failure-threshold           0
        untrust-cac-failure-threshold       0
        last-modified-by
        last-modified-date            2017-04-05 18:53:48
```

Steering pool config:

The following config needs to be enabled on the SBC in order for the media traffic to traverse thru the SBC.

```
steering-pool
     ip-address                10.103.101.246
     start-port            10000
     end-port              20000
     realm-id              SP
     network-interface
     last-modified-by
     last-modified-date          2017-04-05 23:51:38
steering-pool
     ip-address                10.11.107.70
     start-port            10000
     end-port              20000
     realm-id              ENT
     network-interface
     last-modified-by
     last-modified-date          2017-04-05 23:51:49
```

System configuration:

```
system-config
     hostname              osbc1
     description              SBC1 Oracle validation ALE
     location              Baie1 ESXi 113
     mib-system-contact          ILEXIA
     mib-system-name          osbc1
     mib-system-location
     acp-tls-profile
     snmp-enabled          enabled
     enable-snmp-auth-traps          disabled
     enable-snmp-syslog-notify          disabled
     enable-snmp-monitor-traps          disabled
     enable-env-monitor-traps          disabled
     enable-mblk_tracking          disabled
     snmp-syslog-his-table-length      1
     snmp-syslog-level          WARNING
     system-log-level          WARNING
     process-log-level          NOTICE
     process-log-ip-address          0.0.0.0
     process-log-port          0
```

```
collect
    sample-interval           5
    push-interval             15
    boot-state                disabled
    start-time                now
    end-time                  never
    red-collect-state         disabled
    red-max-trans             1000
    red-sync-start-time       5000
    red-sync-comp-time        1000
    push-success-trap-state   disabled
comm-monitor
    state                     disabled
    sbc-grp-id                0
    tls-profile
    qos-enable                enabled
call-trace                disabled
internal-trace            disabled
log-filter                all
default-gateway           10.0.107.254
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
last-modified-date        2017-04-05 18:50:37
```

Codec Policy

```
codec-policy
      name                   ENT
      allow-codecs              PCMA G729 telephone-event
      add-codecs-on-egress         PCMA G729 telephone-event
      order-codecs              PCMA G729 telephone-event
      packetization-time          20
      force-ptime              enabled
      last-modified-by
      last-modified-date          2017-06-06 11:11:58
codec-policy
      name                   SP
      allow-codecs              PCMA G729 telephone-event
      add-codecs-on-egress         PCMA G729 telephone-event
      order-codecs              PCMA G729 telephone-event
      packetization-time          20
      force-ptime              enabled
      last-modified-by
      last-modified-date          2017-06-06 13:11:07
```

Account Config

```
account-config
        hostname                    localhost
        port                    1813
        strategy                    Hunt
        protocol                    RADIUS
        state                   disabled
        max-msg-delay               60
        max-wait-failover           100
        trans-at-close              disabled
        generate-start              OK
        generate-interim            Reinvite-Response
        generate-event
        intermediate-period         0
        file-output             disabled
        file-path               /opt/logs/
        max-file-size               1000000
        max-files               5
        file-compression            disabled
        file-rotate-time            0
        options
        file-delete-alarm           disabled
        ftp-push                disabled
        ftp-address
        ftp-port                21
        ftp-user
        ftp-password
        ftp-remote-path
        cdr-output-redundancy           enabled
        interim-stats-id-types
        prevent-duplicate-attrs         disabled
        vsa-id-range
        cdr-output-inclusive        disabled
        ftp-strategy                Hunt
        ftp-max-wait-failover       120
        diam-attr-id-range
        msg-queue-size              5000
        diam-send-throttle          20
        diam-srvc-ctx-rel
        diam-srvc-ctx-mnc-mcc
        diam-srvc-ctx-ext
        diam-acme-attr-id-range
        max-acr-retries             0
        acr-retry-interval          10
        last-modified-by
        last-modified-date          2017-04-07 10:15:02
```

Enable Authentication

```
authentication
     source-port              1812
     type                 tacacs
     protocol             pap
     tacacs-authorization        enabled
     tacacs-accounting        enabled
     server-assigned-privilege       enabled
     allow-local-authorization       enabled
     login-as-admin           disabled
     management-strategy        hunt
     ike-radius-params-name
     management-servers        10.63.107.57
     tacacs-servers
          address           10.63.107.57
          port            49
          state            enabled
          secret           ********
          realm-id          auth
          dead-time          10
          authentication-methods        all
     last-modified-by
     last-modified-date        2017-04-05 09:39:37
```

Webserver Configuration

A webserver is available on all Enterprise versions of Oracle E-SBCs. The Webserver can be used to provide tracing, configuration and dashboard info. For tracing info, 2 parts must be configured. 1) The webserver must be enabled. 2) Tracing filters must be applied.

```
web-server-config
     state            enabled
     inactivity-timeout       5
     http-state         enabled
     http-port          80
     https-state         disabled
     https-port         443
     tls-profile
```

```
sip-monitoring
     match-any-filter        disabled
     state            enabled
     short-session-duration      0
     monitoring-filters      *
     trigger-window        30
```

Test Plan executed:

Tests summary

- Privacy header sent by Alcatel-Lucent Entreprise not compliant with Completel SIP trunk: Alcatel-Lucent Entreprise use Privacy header with the following value "Privacy=User,Id". However, Completel SIP trunk only supports Privacy=User or Privacy=Id.
- This issue was resolved by setting up a SIP header manipulation rule called FixPrivacy.
- Codec priorities:
    - Completel has a specific codec prioritiy rule with G.711A coming first, then G.729. By default, Alcatel-Lucent OmniPCX Entreprise set G.729 first then G.711A, this setup cause codec negotiation issue.
    - This issue was resolved on the Oracle E-SBC with codec-policy features.
    - T.38 is not supported by Completel SIP platform, so T.38 fax transmission couldn't be tested.
    - Transrating is not working on outbound call, due to VME restriction(This feature is available on other Oracle E-SBC platforms). This issue was resolved using the "force packetization" feature in codec-policy.

#	Test Case	Result	Comments
1	Basic Call	Pass	
2	SIP release causes	Pass	
3	Call forward	Pass	
4	Call transfer	Pass	
5	Conference	Pass	
6	DTMF inbound	Pass	
7	FAX G.711	Pass	
8	FAX T.38	Fail	Completel SIP trunk platform doesn't support T.38
9	DTMF transcoding	N/A	DTMF transcoding isn't available on the VME. DTMF transcoding is supported with other
10	Audio Transcoding	Pass	
11	Audio Transcoding with Transrating	Pass	Transrating works if transcoding is activated during the call
12	Codec priorities and negotiation	Pass	
13	SIP manipulation	Pass	

Note: *A detailed test report is available – If interested, please contact your local account team.*

Troubleshooting Tools

Wireshark

Wireshark is also a network protocol analyzer which is freely downloadable from www.wireshark.org.

On the Oracle E-SBC

The Oracle E-SBC provides a rich set of statistical counters available from the ACLI, as well as log file output with configurable detail. The follow sections detail enabling, adjusting and accessing those interfaces. Resetting the statistical counters, enabling logging and restarting the log files.

At the E-SBC Console:

```
SBC1# reset sipd
SBC1# notify sipd debug
SBC1#
enabled SIP Debugging
SBC1# notify all rotate-logs
```

ExamALU OXEg the log files

Note: You will FTP to the management interface of the E-SBC with the username user and user mode password (the default is
"acme"

```
C:\Documents and Settings\user>ftp 192.168.1.22
Connected to 192.168.85.55.
220 SBC1 server (VxWorks 6.4) ready. User (192.168.1.22:(none)): user
331 Password required for user. Password: acme
230 User user logged in.
ftp> cd /opt/logs
250 CWD command successful. ftp> get sipmsg.log
200 PORT command successful.
150 Opening ASCII mode data connection for '/opt/logs/sipmsg.log' (3353 bytes).
226 Transfer complete.
ftp: 3447 bytes received in 0.00Seconds 3447000.00Kbytes/sec. ftp> get log.sipd
200 PORT command successful.
150 Opening ASCII mode data connection for '/opt/logs/log.sipd' (204681 bytes).
226 Transfer complete.
ftp: 206823 bytes received in 0.11Seconds 1897.46Kbytes/sec
```

You may now examine the log files with the text editor of your choice.

Through the Web GUI

You can also check the display results of filtered SIP session data from the Oracle Enterprise Session Border Controller, and provides traces in a common log format for local viewing or for exporting to your PC. Please check the "Monitor and Trace" section (page 145) of the Web GUI User Guide available at http://docs.oracle.com/cd/E56581_01/index.htm

Appendix A

Full E-SBC Configuration

```
access-control
    realm-id                SP
    description
    source-address          0.0.0.0
    destination-address         10.103.101.246
    application-protocol        SIP
    transport-protocol          ALL
    access              permit
    average-rate-limit          0
    trust-level             high
    minimum-reserved-bandwidth      0
    invalid-signal-threshold        0
    maximum-signal-threshold        0
    untrusted-signal-threshold      0
    deny-period             30
    nat-trust-threshold         0
    max-endpoints-per-nat       0
    nat-invalid-message-threshold       0
    cac-failure-threshold       0
    untrust-cac-failure-threshold       0
    last-modified-by
    last-modified-date          2017-04-10 17:46:05
access-control
    realm-id                ENT
    description
    source-address          10.113.101.246
    destination-address         10.11.107.70
    application-protocol        SIP
    transport-protocol          UDP
    access              permit
    average-rate-limit          0
    trust-level             high
    minimum-reserved-bandwidth      0
    invalid-signal-threshold        0
    maximum-signal-threshold        0
    untrusted-signal-threshold      0
    deny-period             30
    nat-trust-threshold         0
    max-endpoints-per-nat       0
```

```
    nat-invalid-message-threshold        0
    cac-failure-threshold              0
    untrust-cac-failure-threshold        0
    last-modified-by
    last-modified-date            2017-04-05 18:53:26
access-control
    realm-id               ENT
    description
    source-address              10.113.101.247
    destination-address           10.11.107.70
    application-protocol          SIP
    transport-protocol           UDP
    access                 permit
    average-rate-limit            0
    trust-level               high
    minimum-reserved-bandwidth        0
    invalid-signal-threshold         0
    maximum-signal-threshold          0
    untrusted-signal-threshold         0
    deny-period               30
    nat-trust-threshold            0
    max-endpoints-per-nat           0
    nat-invalid-message-threshold        0
    cac-failure-threshold            0
    untrust-cac-failure-threshold        0
    last-modified-by
    last-modified-date            2017-04-05 18:53:48
account-config
    hostname                localhost
    port                1813
    strategy                Hunt
    protocol                RADIUS
    state                disabled
    max-msg-delay              60
    max-wait-failover             100
    trans-at-close             disabled
    generate-start             OK
    generate-interim              Reinvite-Response
    generate-event
    intermediate-period            0
    file-output              disabled
    file-path               /opt/logs/
    max-file-size              1000000
```

```
        max-files               5
        file-compression            disabled
        file-rotate-time            0
        options
        file-delete-alarm           disabled
        ftp-push                disabled
        ftp-address
        ftp-port                21
        ftp-user
        ftp-password
        ftp-remote-path
        cdr-output-redundancy           enabled
        interim-stats-id-types
        prevent-duplicate-attrs         disabled
        vsa-id-range
        cdr-output-inclusive            disabled
        ftp-strategy            Hunt
        ftp-max-wait-failover           120
        diam-attr-id-range
        msg-queue-size              5000
        diam-send-throttle          20
        diam-srvc-ctx-rel
        diam-srvc-ctx-mnc-mcc
        diam-srvc-ctx-ext
        diam-acme-attr-id-range
        max-acr-retries             0
        acr-retry-interval          10
        last-modified-by
        last-modified-date          2017-04-07 10:15:02
audit-logging
        state               enabled
        detail-level            verbose
        file-transfer-time          720
        max-storage-space           32
        percentage-full             75
        max-file-size           5
        storage-path            /code/audit/
        last-modified-by
        last-modified-date          2017-04-05 09:12:10
authentication
        source-port             1812
        type                tacacs
        protocol                pap
```

```
        tacacs-authorization           enabled
        tacacs-accounting              enabled
        server-assigned-privilege          enabled
        allow-local-authorization          enabled
        login-as-admin                 disabled
        management-strategy                hunt
        ike-radius-params-name
        management-servers             10.63.107.57
        tacacs-servers
            address                10.63.107.57
            port                   49
            state                  enabled
            secret                 ********
            realm-id               auth
            dead-time              10
            authentication-methods         all
        last-modified-by
        last-modified-date             2017-04-05 09:39:37
codec-policy
        name                   ENT
        allow-codecs               PCMA G729 telephone-event
        add-codecs-on-egress           PCMA G729 telephone-event
        order-codecs               PCMA G729 telephone-event
        packetization-time             20
        force-ptime                enabled
        last-modified-by
        last-modified-date             2017-06-06 11:11:58
codec-policy
        name                   SP
        allow-codecs               PCMA G729 telephone-event
        add-codecs-on-egress           PCMA G729 telephone-event
        order-codecs               PCMA G729 telephone-event
        packetization-time             20
        force-ptime                enabled
        last-modified-by
        last-modified-date             2017-06-06 13:11:07
filter-config
        name                   aleoxe
        address                10.113.101.246
        user
        last-modified-by
        last-modified-date             2017-04-10 15:42:55
filter-config
```

```
    name                completel
    address                 46.218.190.55
    user
    last-modified-by
    last-modified-date          2017-04-10 15:42:46
host-route
    dest-network            10.120.101.0
    netmask             255.255.255.0
    gateway             10.11.107.254
    description
    last-modified-by
    last-modified-date          2017-04-05 09:05:08
host-route
    dest-network            10.130.101.0
    netmask             255.255.255.0
    gateway             10.11.107.254
    description
    last-modified-by
    last-modified-date          2017-04-05 09:04:55
host-route
    dest-network            172.16.155.0
    netmask             255.255.255.0
    gateway             10.0.107.254
    description
    last-modified-by
    last-modified-date          2017-04-05 08:46:09
host-route
    dest-network            46.218.190.55
    netmask             255.255.255.255
    gateway             10.103.101.254
    description
    last-modified-by
    last-modified-date          2017-04-10 15:34:11
local-policy
    from-address                *
    to-address              *
    source-realm            ENT
    description
    activate-time
    deactivate-time
    state               enabled
    policy-priority             none
    policy-attribute
```

```
            next-hop                 siptrunk.voip.completel.fr
            realm                    SP
            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
       last-modified-date             2017-04-11 12:26:18
local-policy
       from-address                *
       to-address                *
       source-realm             SP
       description
       activate-time
       deactivate-time
       state                enabled
       policy-priority              none
       policy-attribute
            next-hop                 10.113.101.246
            realm                    ENT
            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
    last-modified-date            2017-04-12 11:34:17
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                disabled
    algd-log-level              NOTICE
    mbcd-log-level               NOTICE
    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-untrusted-packet-rate       50000
    max-trusted-packet-rate        50000
    max-arp-packet-rate          1000
    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             enabled
    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
```

```
     last-modified-date          2017-04-07 09:12:33
network-interface
     name                ENT
     sub-port-id             0
     description
     hostname
     ip-address          10.11.107.70
     pri-utility-addr       10.11.107.71
     sec-utility-addr       10.11.107.72
     netmask             255.255.255.0
     gateway             10.11.107.254
     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
     ftp-address
     icmp-address           10.11.107.70
     snmp-address
     telnet-address
     ssh-address
     last-modified-by
     last-modified-date          2017-04-04 15:36:08
network-interface
     name                SP
     sub-port-id             0
     description
     hostname
     ip-address          10.103.101.246
     pri-utility-addr       10.103.101.247
     sec-utility-addr       10.103.101.248
     netmask             255.255.255.0
     gateway             10.103.101.254
     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
    ftp-address
    icmp-address           10.103.101.246
    snmp-address
    telnet-address
    ssh-address
    last-modified-by
    last-modified-date          2017-04-04 15:36:52
network-interface
    name                   wancom1
    sub-port-id             0
    description
    hostname
    ip-address
    pri-utility-addr         10.0.0.1
    sec-utility-addr         10.0.0.2
    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
    signaling-mtu           0
```

```
    hip-ip-list
    ftp-address
    icmp-address
    snmp-address
    telnet-address
    ssh-address
    last-modified-by
    last-modified-date          2017-04-04 15:59:02
network-interface
    name                   wancom2
    sub-port-id            0
    description
    hostname
    ip-address
    pri-utility-addr          10.0.1.1
    sec-utility-addr          10.0.1.2
    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
    signaling-mtu          0
    hip-ip-list
    ftp-address
    icmp-address
    snmp-address
    telnet-address
    ssh-address
    last-modified-by
    last-modified-date          2017-04-04 15:59:23
ntp-config
    server             172.16.155.250
    last-modified-by
    last-modified-date          2017-04-05 08:45:40
```

```
phy-interface
    name                ENT
    operation-type          Media
    port            0
    slot            1
    virtual-mac         00:50:56:bd:00:1f
    admin-state         enabled
    auto-negotiation        enabled
    duplex-mode
    speed
    wancom-health-score         50
    overload-protection         disabled
    last-modified-by
    last-modified-date          2017-04-04 15:55:15
phy-interface
    name                SP
    operation-type          Media
    port            0
    slot            0
    virtual-mac         00:50:56:bd:00:0f
    admin-state         enabled
    auto-negotiation        enabled
    duplex-mode         FULL
    speed           100
    wancom-health-score         50
    overload-protection         disabled
    last-modified-by
    last-modified-date          2017-04-04 15:55:02
phy-interface
    name                wancom1
    operation-type          Control
    port            1
    slot            0
    virtual-mac
    admin-state         enabled
    auto-negotiation        enabled
    duplex-mode
    speed
    wancom-health-score         20
    overload-protection         disabled
    last-modified-by        admin@172.16.120.7
    last-modified-date          2017-04-04 16:45:01
phy-interface
```

```
    name                    wancom2
    operation-type          Control
    port                2
    slot              0
    virtual-mac
    admin-state             enabled
    auto-negotiation        enabled
    duplex-mode
    speed
    wancom-health-score        20
    overload-protection        disabled
    last-modified-by
    last-modified-date         2017-04-04 16:45:08
realm-config
    identifier          ENT
    description
    addr-prefix           0.0.0.0
    network-interfaces        ENT:0.4
    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
    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
device-id
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
spl-options
accounting-enable              enabled
net-management-control            disabled
delay-media-update              disabled
refer-call-transfer             disabled
hold-refer-reinvite             disabled
refer-notify-provisional           none
dyn-refer-term                disabled
codec-policy                ENT
codec-manip-in-realm            disabled
codec-manip-in-network            enabled
rtcp-policy
constraint-name
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         aleoxe
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type             none
        last-modified-by
        last-modified-date         2017-04-05 22:08:34
realm-config
        identifier                 SP
        description
        addr-prefix                0.0.0.0
        network-interfaces         SP:0.4
        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
class-profile
in-translationid
out-translationid
in-manipulationid
out-manipulationid
average-rate-limit             0
access-control-trust-level          medium
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
device-id
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
spl-options
accounting-enable             enabled
net-management-control           disabled
delay-media-update             disabled
refer-call-transfer            disabled
```

```
     hold-refer-reinvite           disabled
     refer-notify-provisional          none
     dyn-refer-term                disabled
     codec-policy              SP
     codec-manip-in-realm          disabled
     codec-manip-in-network          enabled
     rtcp-policy
     constraint-name
     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            completel
     node-functionality
     default-location-string
     alt-family-realm
     pref-addr-type              none
     last-modified-by
     last-modified-date            2017-04-07 13:42:25
realm-config
     identifier                auth
     description
     addr-prefix               0.0.0.0
     network-interfaces            ENT:0.4
     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
```

```
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
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
device-id
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
        spl-options
        accounting-enable          enabled
        net-management-control          disabled
        delay-media-update            disabled
        refer-call-transfer          disabled
        hold-refer-reinvite          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
        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
        last-modified-date            2017-04-05 09:37:59
redundancy-config
        state              enabled
        log-level              INFO
```

```
        health-threshold              75
        emergency-threshold               50
        port                      9090
        advertisement-time            500
        percent-drift             210
        initial-time              1250
        becoming-standby-time             180000
        becoming-active-time          100
        cfg-port                  1987
        cfg-max-trans             10000
        cfg-sync-start-time           5000
        cfg-sync-comp-time            1000
        gateway-heartbeat-interval        0
        gateway-heartbeat-retry           0
        gateway-heartbeat-timeout         1
        gateway-heartbeat-health          0
        media-if-peercheck-time           0
        peer
            name                  osbc1
            state                 enabled
            type                  Primary
            destination
                address               10.0.0.1:9090
                network-interface         wancom1:0
            destination
                address               10.0.1.1:9090
                network-interface         wancom2:0
        peer
            name                  osbc2
            state                 enabled
            type                  Secondary
            destination
                address               10.0.0.2:9090
                network-interface         wancom1:0
            destination
                address               10.0.1.2:9090
                network-interface         wancom2:0
        last-modified-by
        last-modified-date            2017-04-04 16:01:15
session-agent
        hostname                  10.113.101.246
        ip-address                10.113.101.246
        port                      5060
```

```
state                   enabled
app-protocol            SIP
app-type
transport-method        UDP
realm-id                ENT
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             OPTIONS
ping-interval           60
ping-send-mode          keep-alive
ping-all-addresses      disabled
ping-in-service-response-codes
out-service-response-codes
load-balance-dns-query      hunt
options
spl-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
    auth-attributes
        auth-realm          siptrunk.voip.completel.fr
        username              0912345678
        password            ********
        in-dialog-methods         INVITE
                    BYE
                    ACK
                    CANCEL
                    OPTIONS
                    PRACK
                    NOTIFY
                    UPDATE
```

```
    session-recording-server
    session-recording-required        disabled
    hold-refer-reinvite             disabled
    send-tcp-fin                disabled
    last-modified-by
    last-modified-date              2017-04-07 14:09:07
session-agent
    hostname                siptrunk.voip.completel.fr
    ip-address              46.218.190.55
    port                5060
    state               enabled
    app-protocol            SIP
    app-type
    transport-method            UDP
    realm-id                SP
    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             OPTIONS
```

```
ping-interval                  600
ping-send-mode                 keep-alive
ping-all-addresses             disabled
ping-in-service-response-codes    200,483
out-service-response-codes
load-balance-dns-query         hunt
options
spl-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      100
early-media-allow
invalidate-registrations       enabled
rfc2833-mode             transparent
rfc2833-payload          101
codec-policy          SP
enforcement-profile
refer-call-transfer          disabled
refer-notify-provisional        none
reuse-connections            NONE
tcp-keepalive          none
tcp-reconn-interval          0
max-register-burst-rate        100
register-burst-window          0
sip-profile
sip-isup-profile
kpml-interworking              inherit
monitoring-filters          completel
session-recording-server
session-recording-required        disabled
```

```
        hold-refer-reinvite           disabled
        send-tcp-fin                  disabled
        last-modified-by
        last-modified-date            2017-04-11 13:08:00
sip-config
        state                 enabled
        operation-mode                dialog
        dialog-transparency           enabled
        home-realm-id
        egress-realm-id
        auto-realm-id
        nat-mode              None
        registrar-domain              *
        registrar-host              *
        registrar-port              0
        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               drain-sendonly
                        max-udp-length=0
                        sag-target-uri=ip
                        set-inv-exp-at-100-resp
        add-reason-header             disabled
        sip-message-len          4096
        enum-sag-match                enabled
        extra-method-stats            disabled
```

```
        extra-enum-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
        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
        last-modified-date            2017-04-10 16:00:10
sip-feature
        name                  REGISTER
        realm                 ENT
        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
        last-modified-date            2017-04-07 13:01:19
sip-feature
        name                  REGISTER
```

```
        realm                    SP
        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
        last-modified-date          2017-04-07 12:14:47
sip-interface
        state                  enabled
        realm-id                 ENT
        description
        sip-port
            address                 10.11.107.70
            port                  5060
            transport-protocol          UDP
            tls-profile
            allow-anonymous            agents-only
            multi-home-addrs
            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            none
        nat-interval             60
        tcp-nat-interval           90
        registration-caching         enabled
        min-reg-expire            300
        registration-interval        3600
        route-to-registrar          disabled
        secured-network           disabled
        teluri-scheme            disabled
        uri-fqdn-domain
        options
        spl-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            fromENT
out-manipulationid
sip-ims-feature              disabled
sip-atcf-feature             disabled
subscribe-reg-event          enabled
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
ldap-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            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-bye            disabled
        send-380-response
        pcscf-restoration
        session-timer-profile
        session-recording-server
        session-recording-required         disabled
        service-tag
        reg-cache-route              disabled
        last-modified-by
        last-modified-date             2017-04-11 13:07:34
sip-interface
        state                  enabled
        realm-id                 SP
        description
        sip-port
            address                 10.103.101.246
            port                5060
            transport-protocol            UDP
            tls-profile
            allow-anonymous              agents-only
            multi-home-addrs
            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             none
        nat-interval            60
        tcp-nat-interval           90
        registration-caching          enabled
        min-reg-expire           300
        registration-interval          3600
        route-to-registrar           disabled
```

```
secured-network            disabled
teluri-scheme              disabled
uri-fqdn-domain
options                    early-media-sdp-realms
spl-options
trust-mode                 agents-only
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          fromSP
out-manipulationid         toSP
sip-ims-feature            disabled
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
ext-policy-server
ldap-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          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-bye              disabled
        send-380-response
        pcscf-restoration
        session-timer-profile
        session-recording-server
        session-recording-required          disabled
        service-tag
        reg-cache-route              disabled
        last-modified-by
        last-modified-date          2017-04-11 13:08:12
sip-manipulation
        name              fromENT
        description
        split-headers
        join-headers
        header-rule
            name              callRejectOPTIONS
            header-name              CSeq
            action              sip-manip
            comparison-type              case-sensitive
            msg-type              request
            methods              OPTIONS
            match-value
            new-value              rejectOPTIONS
        last-modified-by
        last-modified-date          2017-05-17 13:20:47
sip-manipulation
        name              fromSP
        description
        split-headers
```

```
join-headers
header-rule
      name              callRejectOPTIONS
      header-name          CSeq
      action           sip-manip
      comparison-type          case-sensitive
      msg-type            request
      methods            OPTIONS
      match-value
      new-value            rejectOPTIONS
header-rule
      name            FromFix
      header-name          From
      action           manipulate
      comparison-type          case-sensitive
      msg-type            any
      methods
      match-value
      new-value
      element-rule
            name              FixFrom
            parameter-name
            type              uri-host
            action              replace
            match-val-type          fqdn
            comparison-type          case-sensitive
            match-value
            new-value            10.11.107.70
header-rule
      name            ToFix
      header-name          To
      action           manipulate
      comparison-type          case-sensitive
      msg-type            any
      methods
      match-value
      new-value
      element-rule
            name              FixTo
            parameter-name
            type              uri-host
            action              replace
            match-val-type          fqdn
```

```
                 comparison-type              case-sensitive
                 match-value
                 new-value                    10.11.107.70
          header-rule
              name                 RuriFix
              header-name              request-uri
              action               manipulate
              comparison-type            case-sensitive
              msg-type             request
              methods
              match-value
              new-value
              element-rule
                  name                 FixRuri
                  parameter-name
                  type             uri-host
                  action               replace
                  match-val-type           ip
                  comparison-type            case-sensitive
                  match-value
                  new-value                10.113.101.246
          header-rule
              name                 fix183
              header-name              From
              action           sip-manip
              comparison-type            case-sensitive
              msg-type             any
              methods
              match-value
              new-value                stripSdp183
          header-rule
              name                 fix180
              header-name              From
              action           sip-manip
              comparison-type            case-sensitive
              msg-type             any
              methods
              match-value
              new-value                stripSdp180
       last-modified-by
       last-modified-date        2017-05-17 13:39:39
sip-manipulation
    name                 rejectOPTIONS
```

```
     description          Answers locally OPTIONS requests with 200 OK
     split-headers
     join-headers
     header-rule
          name                    HR_RejectOPTIONS
          header-name                From
          action                  reject
          comparison-type            case-sensitive
          msg-type                out-of-dialog
          methods                 OPTIONS
          match-value
          new-value               200:OK
     last-modified-by
     last-modified-date           2017-04-07 09:04:00
sip-manipulation
     name                    stripSdp180
     description           For incoming 180 from Completel, strip SDP

     split-headers
     join-headers
     header-rule
          name                    check180
          header-name                @status-line
          action                  store
          comparison-type            pattern-rule
          msg-type                any
          methods
          match-value
          new-value
          element-rule
               name                    is180
               parameter-name             status-code
               type                    status-code
               action                  store
               match-val-type             any
               comparison-type            pattern-rule
               match-value             180
               new-value
     header-rule
          name                    delSdp
          header-name                Content-Type
          action                  manipulate
          comparison-type            case-insensitive
```

```
        msg-type                any
        methods
        match-value                  $check180.$is180
        new-value
        element-rule
            name                  del180SDP
            parameter-name            application/sdp
            type                  mime
            action                delete-element
            match-val-type            any
            comparison-type             boolean
            match-value
            new-value
    header-rule
        name                delContentType
        header-name             Content-Type
        action              manipulate
        comparison-type             boolean
        msg-type                any
        methods
        match-value                  $check180.$is180
        new-value
        element-rule
            name                  delCT
            parameter-name                  *
            type                  header-param
            action                delete-header
            match-val-type              any
            comparison-type              case-sensitive
            match-value
            new-value
    last-modified-by
    last-modified-date              2017-05-17 13:37:23
sip-manipulation
    name                  stripSdp183
    description          For incoming 183 from Completel, strip SDP

    split-headers
    join-headers
    header-rule
        name                  check183
        header-name                 @status-line
        action                store
```

```
                comparison-type              pattern-rule
                msg-type              any
                methods
                match-value
                new-value
                element-rule
                    name                     is183
                    parameter-name                 status-code
                    type               status-code
                    action             store
                    match-val-type              any
                    comparison-type              pattern-rule
                    match-value              183
                    new-value
          header-rule
                name                  delSdp
                header-name               Content-Type
                action              manipulate
                comparison-type               case-insensitive
                msg-type              any
                methods
                match-value               $check183.$is183
                new-value
                element-rule
                    name                     del183SDP
                    parameter-name                 application/sdp
                    type               mime
                    action             delete-element
                    match-val-type              any
                    comparison-type               boolean
                    match-value
                    new-value
          header-rule
                name                  delContentType
                header-name               Content-Type
                action              manipulate
                comparison-type               boolean
                msg-type              any
                methods
                match-value               $check183.$is183
                new-value
                element-rule
                    name                     delCT
```

```
            parameter-name                    *
            type                 header-param
            action                delete-header
            match-val-type              any
            comparison-type               case-sensitive
            match-value
            new-value
      last-modified-by
      last-modified-date          2017-05-17 13:32:53
sip-manipulation
      name                  toSP
      description                       Basic topology hiding manipulation.
      split-headers
      join-headers
      header-rule
            name                  FromFix
            header-name              From
            action                manipulate
            comparison-type               case-sensitive
            msg-type              any
            methods
            match-value
            new-value
            element-rule
                  name                  FixUriHost
            parameter-name
            type                 uri-host
            action                replace
            match-val-type              ip
            comparison-type               case-sensitive
            match-value
            new-value                 $LOCAL_IP
      header-rule
            name                  ToFix
            header-name              To
            action                manipulate
            comparison-type               case-sensitive
            msg-type              any
            methods
            match-value
            new-value
            element-rule
                  name                  FixUriHost
```

```
            parameter-name
            type                    uri-host
            action                    replace
            match-val-type                ip
            comparison-type               case-sensitive
            match-value
            new-value                 $REMOTE_IP
    header-rule
        name                PAIFix
        header-name             P-Asserted-Identity
        action            manipulate
        comparison-type           case-sensitive
        msg-type              any
        methods
        match-value
        new-value
        element-rule
            name                FixUriHost
            parameter-name
            type                    uri-host
            action                    replace
            match-val-type                ip
            comparison-type               case-sensitive
            match-value
            new-value             $LOCAL_IP
    header-rule
        name                FixRuri
        header-name             request-uri
        action            manipulate
        comparison-type           case-sensitive
        msg-type              any
        methods
        match-value
        new-value
        element-rule
            name                RuriFix
            parameter-name
            type                    uri-host
            action                    replace
            match-val-type                ip
            comparison-type               case-sensitive
            match-value
            new-value             siptrunk.voip.completel.fr
```

```
        last-modified-by
        last-modified-date            2017-04-10 18:11:32
sip-monitoring
        match-any-filter              enabled
        state                 enabled
        short-session-duration        0
        monitoring-filters            completel,aleoxe
        trigger-window                30
        last-modified-by
        last-modified-date            2017-04-05 10:26:52
steering-pool
        ip-address            10.103.101.246
        start-port            10000
        end-port              20000
        realm-id              SP
        network-interface
        last-modified-by
        last-modified-date            2017-04-05 23:51:38
steering-pool
        ip-address            10.11.107.70
        start-port            10000
        end-port              20000
        realm-id              ENT
        network-interface
        last-modified-by
        last-modified-date            2017-04-05 23:51:49
surrogate-agent
        register-host                 siptrunk.voip.completel.fr
        register-user                 0973329886
        description                   Credentials for Completel sip trunk
        realm-id              ENT
        state                 enabled
        customer-host
        customer-next-hop             46.218.190.55
        register-contact-host         siptrunk.voip.completel.fr
        register-contact-user         0912345678
        password              Password
        register-expires              600
        replace-contact               disabled
        options               auth-info=refresh
                      auth-method="INVITE,CANCEL,ACK,BYE"
        route-to-registrar            enabled
        aor-count             1
```

```
        auth-user                    0973329886
      max-register-attempts              10
      register-retry-time               300
      count-start              1
      register-mode                 automatic
      triggered-inactivity-interval      30
      triggered-oos-response            503
      last-modified-by
      last-modified-date            2017-04-10 18:20:44
system-config
      hostname                  osbc1
      description                SBC1 Oracle validation ALE
      location                Baie1 ESXi 113
      mib-system-contact            ILEXIA
      mib-system-name               osbc1
      mib-system-location
      acp-tls-profile
      snmp-enabled               enabled
      enable-snmp-auth-traps          disabled
      enable-snmp-syslog-notify        disabled
      enable-snmp-monitor-traps         disabled
      enable-env-monitor-traps         disabled
      enable-mblk_tracking          disabled
      snmp-syslog-his-table-length       1
      snmp-syslog-level             WARNING
      system-log-level             WARNING
      process-log-level             NOTICE
      process-log-ip-address          0.0.0.0
      process-log-port             0
      collect
          sample-interval              5
          push-interval               15
          boot-state             disabled
          start-time             now
          end-time              never
          red-collect-state          disabled
          red-max-trans             1000
          red-sync-start-time           5000
          red-sync-comp-time            1000
          push-success-trap-state        disabled
      comm-monitor
          state              disabled
          sbc-grp-id               0
```

```
      tls-profile
      qos-enable                    enabled
call-trace                 disabled
internal-trace                 disabled
log-filter               all
default-gateway                  10.0.107.254
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
last-modified-date                2017-04-05 18:50:37
```

Appendix B

Accessing the ACLI

Access to the ACLI is provided by:

- The serial console connection;
- TELNET, which is enabled by default but may be disabled; and
- SSH, this must be explicitly configured.

Initial connectivity will be through the serial console port. At a minimum, this is how to configure the management (eth0) i nterface on the E-SBC.

ACLI Basics

There are two password protected modes of operation within the ACLI, User mode and Superuser mode. When you establish a connection to the E-SBC, the prompt for the User mode password appears. The default password is acme. User mode consists of a restricted set of basic monitoring commands and is identified by the greater than sign (>) in the system prompt after the target name. You cannot perform configuration and maintenance from this mode.
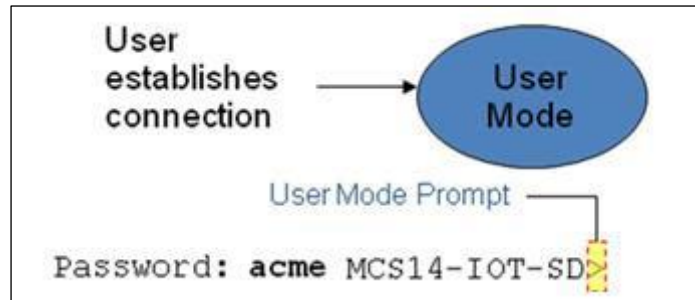
The Superuser mode allows for access to all system commands for operation, maintenance, and administration. This mode is identified by the pound sign (#) in the prompt after the target name. To enter the Superuser mode, issue the enable command i n the User mode.
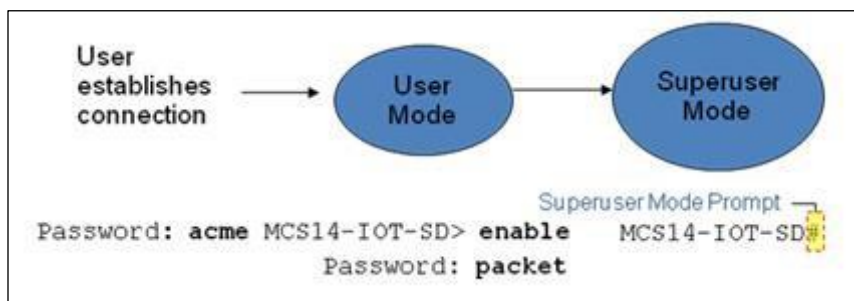
From the Superuser mode, you can perform monitoring and administrative tasks; however you cannot configure any elements. To return to User mode, issue the exit command.

You must enter the Configuration mode to configure elements. For example, you can access the configurati on branches and configuration elements for signaling and media configurations. To enter the Configuration mode, issue the configure terminal command in the Superuser mode.

Configuration mode is identified by the word configure in parenthesis followed by the pound sign (#) in the prompt after the target name, for example, SBC1 (configure)#. To return to the Superuser mode, issue the exit command.
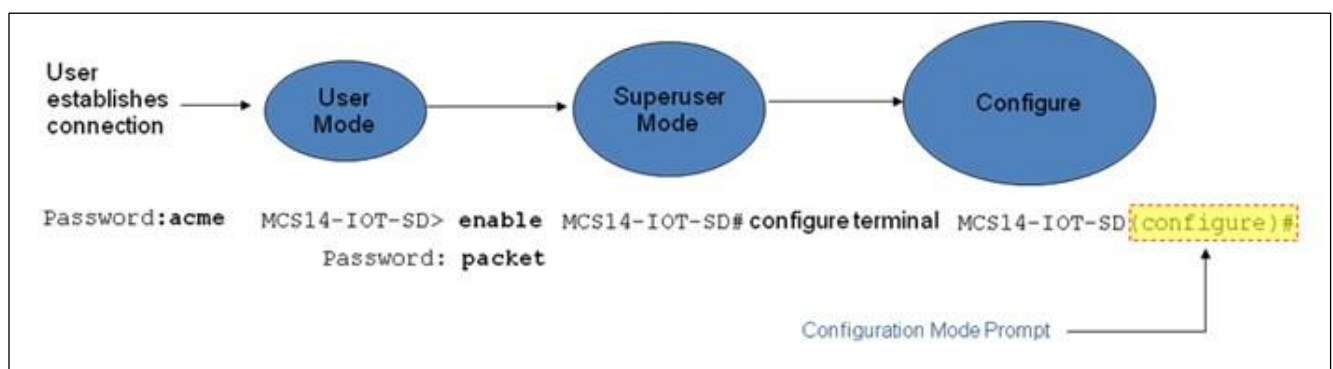
In the configuration mode, there are six configuration branches:

- bootparam;

- ntp-sync;

- media-manager;

- session-router;

- system; and

- security.
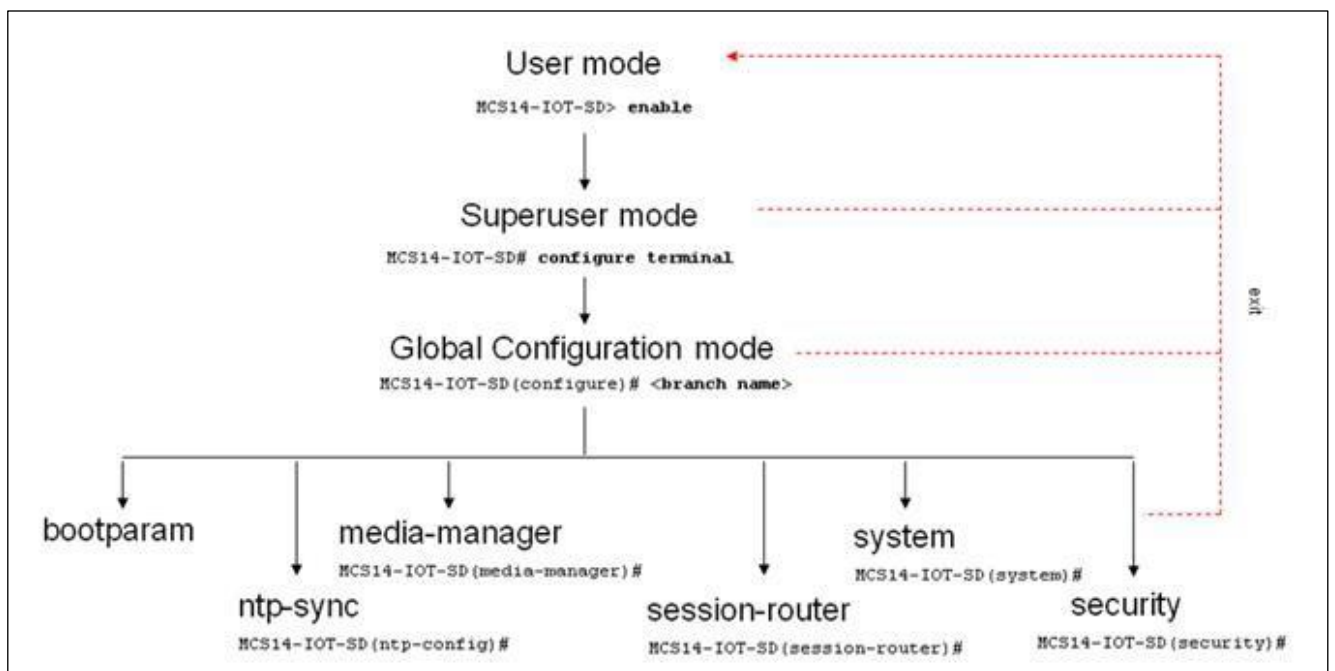
The ntp-sync and bootparams branches are flat branches (i.e., they do not have elements inside the branches). The rest of the branches have several elements under each of the branches.

The bootparam branch provides access to E-SBC boot parameters. Key boot parameters include:

- boot device – The global management port, usually eth0

- file name – The boot path and the image file.

- inet on ethernet – The IP address and subnet mask (in hex) of the management port of the SD.

- host inet –The IP address of external server where image file resides.

- user and ftp password – Used to boot from the external FTP server.

- gateway inet – The gateway IP address for reaching the external server, if the server is located in a different network.

```
'.' = clear field;   '-' = go to previous field;   q = quit
boot device              : eth0
processor number         : 0
host name                :
file name                : /tffs0/nnSCX620.gz
inet on ethernet (e)     : 10.0.3.11:ffff0000
inet on backplane (b)    :
host inet (h)            : 10.0.3.100
gateway inet (g)         : 10.0.0.1
user (u)                 : anonymous
ftp password (pw) (blank = rsh)      : anonymous
flags (f)                : 0x8
target name (tn)         : MCS14-IOT-SD
startup script (s)       :
other (o)
```

The ntp-sync branch provides access to ntp server configuration commands for synchronizing

the E-SBC time and date. The security branch provides access to security configuration.

The system branch provides access to basic configuration elements as system-config, snmp-community, redundancy, physical interfaces, network interfaces, etc.

The session-router branch provides access to signaling and routing related elements, including H323-config, sip-config, iwf-config, local-policy, sip-manipulation, session-agent, etc.

The media-manager branch provides access to media-related elements, including realms, steering pools, dns-config, media- manager, and so forth.

You will use media-manager, session-router, and system branches for most of your working configuration.

Configuration Elements

The configuration branches contain the configuration elements. Each configurable object is referred to as an element. Each element consists of a number of configurable parameters.

Some elements are single-instance elements, meaning that there is only one of that type of the element - for example, the global system configuration and redundancy configuration.

Some elements are multiple-instance elements. There may be one or more of the elements of any given type. For example, physical and network interfaces.

Some elements (both single and multiple instance) have sub-elements. For example:

- SIP-ports - are children of the sip-interface element

- peers – are children of the redundancy element

- destinations – are children of the peer element

Creating an Element

1. To create a single-instance element, you go to the appropriate level in the ACLI path and enter its parameters. There is no need to specify a unique identifier property because a single-instance element is a global element and there is only one instance of this element.

2. When creating a multiple-instance element, you must specify a unique identifier for each instance of the element.

3. It is important to check the parameters of the element you are configuring before committing the changes. You do this by issuing the show command before issuing the done command. The parameters that you did not configure are filled with either default values or left empty.

4. On completion, you must issue the done command. The done command causes the configuration to be echoed to the screen and commits the changes to the volatile memory. It is a good idea to review this output to ensure that your configurations are correct.

5. Issue the exit command to exit the selected element.

Note that the configurations at this point are not permanently saved yet. If the E-SBC reboots, your configurations will be lost.

Editing an Element

The procedure of editing an element is similar to creating an element, except that you must select the element that you will edit before editing it.

- Enter the element that you will edit at the correct level of the ACLI path.

- Select the element that you will edit, and view it before editing it.
- The select command loads the element to the volatile memory for editing. The show command allows you to view the element to ensure that it is the right one that you want to edit.
- Once you are sure that the element you selected is the right one for editing, edit the parameter one by one. The new value you provide will overwrite the old value.
- It is important to check the properties of the element you are configuring before committing it to the volatile memory. You do this by issuing the show command before issuing the done command.
- On completion, you must issue the done command.
- Issue the exit command to exit the selected element.

Note that the configurations at this point are not permanently saved yet. If the E-SBC reboots, your configurations will be lost.

Deleting an Element

The no command deletes an element from the configuration in editing. To delete a single-instance

element,

- Enter the no command from within the path for that specific element
- Issue the exit command. To delete a multiple-instance element,

- Enter the no command from within the path for that particular element.
- The key field prompt, such as <name>:<sub-port-id>, appears.
- Use the <Enter> key to display a list of the existing configured elements.
- Enter the number corresponding to the element you wish to delete.
- Issue the select command to view the list of elements to confirm that the element was removed.

Note that the configuration changes at this point are not permanently saved yet. If the E-SBC reboots, your configurations will be lost.

Configuration Versions

At any time, three versions of the configuration can exist on the E-SBC: the edited configuration, the saved configuration, and the running configuration.

- The edited configuration – this is the version that you are making changes to. This version of the configuration is stored in the E-SBC's volatile memory and will be lost on a reboot.
- To view the editing configuration, issue the show configuration command
- The saved configuration – on issuing the save-config command, the edited configuration is copied into the non- volatile memory on the E-SBC and becomes the saved configuration. Because the saved configuration has not been activated yet, the changes in the configuration will not take effect. On

reboot, the last activated configuration (i.e., the last running configuration) will be loaded, not the saved configuration.

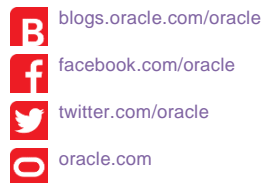- The running configuration is the saved then activated configuration. On issuing the activate-config command, the saved configuration is copied from the non-volatile memory to the volatile memory. The saved configuration is activated and becomes the running configuration. Although most of the configurations can take effect once being activated without reboot, some configurations require a reboot for the changes to take effect.
- To view the running configuration, issue command show running-config.

Saving the Configuration

The save-config command stores the edited configuration persistently.

Because the saved configuration has not been activated yet, changes in configuration will not take effect. On reboot, the las t activated configuration (i.e., the last running configuration) will be loaded. At this stage, the saved configuration is different from the running configuration.

Because the saved configuration is stored in non-volatile memory, it can be accessed and activated at later time.

Upon issuing the save-config command, the E-SBC displays a reminder on screen stating that you must use the activate- config command if you want the configurations to be updated.

```
SBC1 # save-config
Save-Config received, processing. waiting 1200
for request to finish Request to 'SAVE-CONFIG'
has Finished, Save complete
Currently active and saved configurations do not match!
To sync & activate, run 'activate-config' or 'reboot activate'.
SBC1
```

Activating the Configuration

On issuing the activate-config command, the saved configuration is copied from the non-volatile memory to the volatile memory. The saved configuration is activated and becomes the running configuration.

Some configuration changes are service affecting when activated. For these configurations, the E-SBC warns that the change could have an impact on service with the configuration elements that will potentially be service affecting. You may decide whether or not to continue with applying these changes immediately or to apply them at a later time.

```
SBC1# activate-config Activate-Config
received, processing. waiting 120000 for
request to finish Request to 'ACTIVATE-
CONFIG' has Finished, Activate Complete
SBC1#
```