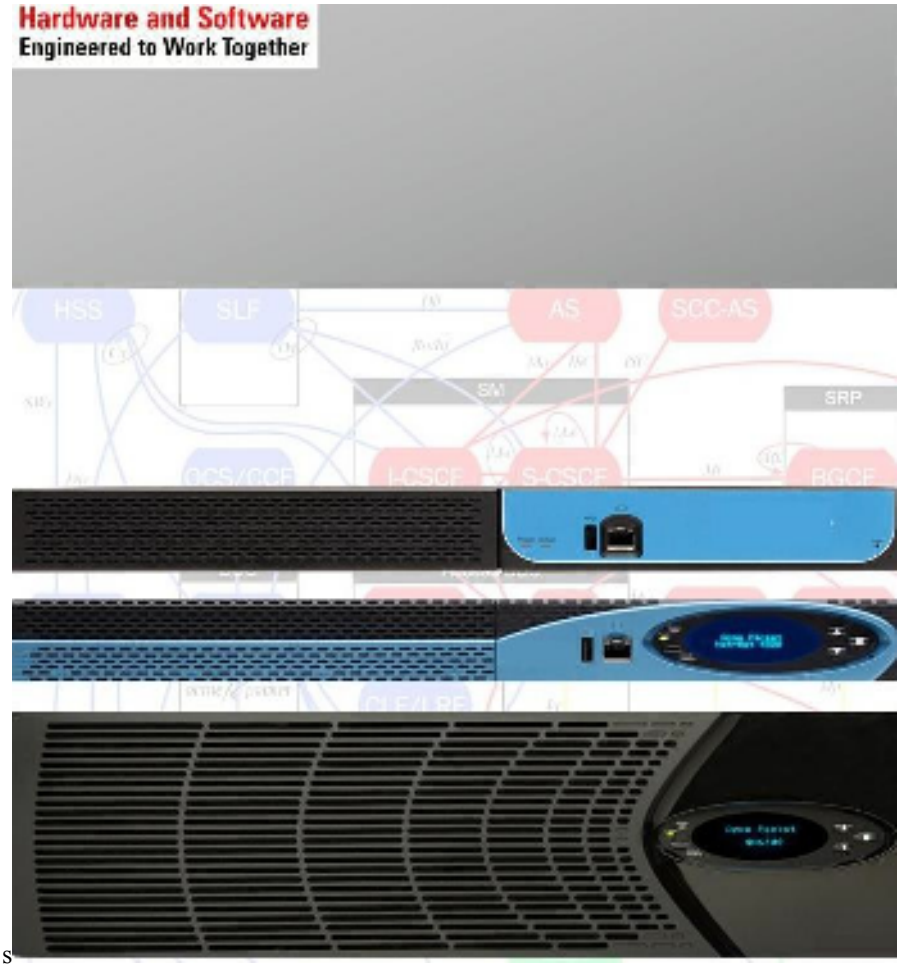

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Oracle Enterprise Session Border Controller and Avaya CS1Kwith Telus Enterprise SIP Trunking R2

Technical Application Note

ORACLE

Disclaimer

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

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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

AvayaCS1Koffers 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 Avaya CS1K, Oracle E-SBCs and IP Trunking services are configured in the optimal manner.

Introduction

Audience

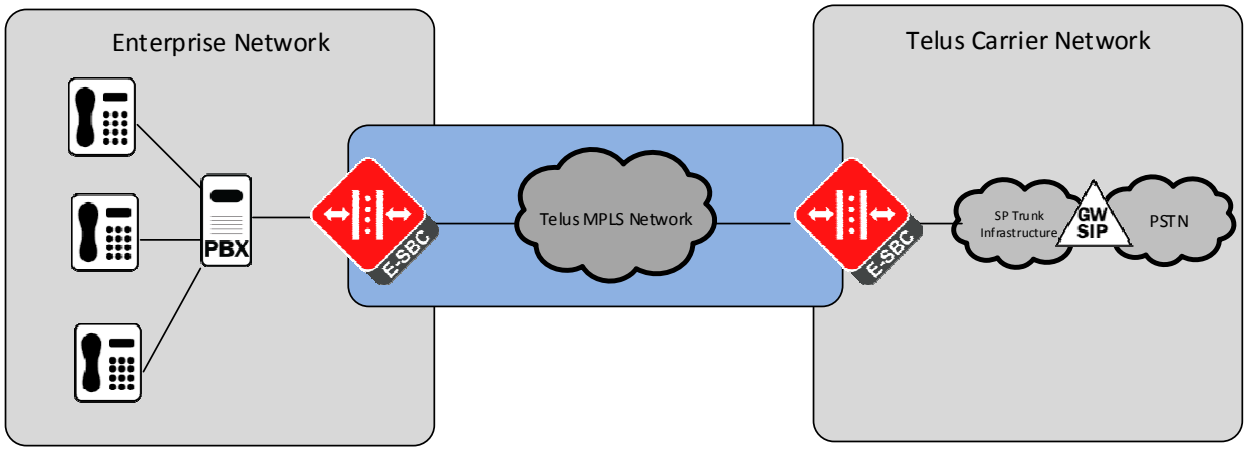
This is a technical document intended for telecommunications engineers with the purpose of configuring the Oracle Enterprise Session Border Controller and the Avaya CS1K. There will be steps that require navigating the Command Line Interface (ACLI). Understanding the basic concepts of TCP/UDP, IP/Routing, and SIP/RTP are also necessary to complete the configuration and for troubleshooting, if necessary.

Requirements

- Avaya/Nortel - CS1000 – version X21 7.65 Service Pack 5
- Avaya Session Manager – 6.3.6.1.663005
- Oracle Enterprise Session Border Controller is running software ECZ720p1.64.bz. Note: the configuration running on the E-SBC is backward/forward compatible with any release in the 7.2.0 stream.

Architecture

The following reference architecture shows a logical view of the connectivity betweenCS1Kand the E-SBC.



Lab Configuration

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

description	network-interface	realm	interface IP	sip-port
E-SBC interfaces				
management	wancom0		192.168.1.22	
redundancy	wancom1		169.254.1.1	
redundancy	wancom2		169.254.2.1	
media/signalling	s0p0:0	core	172.16.153.34	5060
media/signalling	s1p0:0	peer	172.16.154.35	5060
Session-Agents				
CS1K trunk		peer	172.16.149.38	5060
Telus trunk		core	10.27.56.7	5060

Configuring the Oracle Enterprise SBC

In this section we describe the steps for configuring an Oracle Enterprise SBC, formally known as an Acme Packet Net-Net Session Director ("SBC"), for use withCS1KServer 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 SBC. This document covers the setup for the SD platform running software ECZ7.2.0 or later. If instructions are needed for other Oracle 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 Superuser 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 ofCS1Kexternal 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 SBC password is "**acme**" and the default super user password is "**packet**".

```
Password: acme
TLAB-SBC1> enable
Password: packet
TLAB-SBC1# configure terminal
TLAB-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

TLAB-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

```
TLAB-SBC1#(configure)bootparam
'.' = clear field;  '-' = go to previous field;  q = quit
boot device             : eth0
processor number        : 0
host name               : acmesystem
file name               : /code/images/nnECZ720p2.64.bz --- >location
where the software is loaded on the SBC
inet on ethernet (e)    : 192.168.1.22: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)         : 192.168.1.1 -> gateway address here
user (u)                 : vxftp
ftp password (pw) (blank = use rsh)      :
vxftp flags (f)          :
target name (tn)         : TLAB-SBC1 -> ACLI prompt name & HA peer name
startup script (s)       :
other (o)                :
```

Configuring the E-SBC

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

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                             HA_HEARTBEAT1
        hostname
        ip-address
        pri-utility-addr                        169.254.1.1
        sec-utility-addr                        169.254.1.2
        netmask                                 255.255.255.252
        gateway
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
network-interface
        name                                    wancom2
        sub-port-id                             0
        description                             HA_HEARTBEAT2
```

```
        hostname
        ip-address
        pri-utility-addr                        169.254.2.1
        sec-utility-addr                        169.254.2.2
        netmask                                 255.255.255.252
        gateway
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
```

```
redundancy-config
        becoming-standby-time                   360000
        peer
                name                                    TLAB-SBC1
                type                                    Primary
                destination
                        address                                 169.254.1.1:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.1:9090
                        network-interface                       wancom2:0
        peer
                name                                    TLAB-SBC2
                type                                    Secondary
                destination
                        address                                 169.254.1.2:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.2:9090
                        network-interface                       wancom2:0
```

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

```
network-interface
        name                                    s0p0
        sub-port-id                             0
        description                             Outside/Untrusted
        hostname
        ip-address                              172.16.153.24
        pri-utility-addr                        172.16.153.2
        sec-utility-addr                        172.16.153.3
        netmask                                 255.255.255.0
```

```
        gateway                                 172.16.153.1
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        signaling-mtu                           0
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
network-interface
        name                                    s1p0
        sub-port-id                             0
        description                             Inside/Trusted
        hostname
        ip-address                              172.16.154.25
        pri-utility-addr                        172.16.154.2
        sec-utility-addr                        172.16.154.3
        netmask                                 255.255.255.0
        gateway                                 172.16.154.1
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        signaling-mtu                           0
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
```

Telus Trunk Authentication

Telus trunking release 2 requires both Registration of the trunk and Authentication challenges on SIP INVITE Methods. Telus will provide the information similar to the following:

- SIP User Name: user123456

- SIP Domain: ipnet4.com
- SIP Password: pass123456
- DID: 2223334444

There are 3 parts to the configuration. A surrogate agent is needed to register the trunk on behalf of the IPPBX. Surrogate registration requires **registration-caching** to be set to **enabled** on the **sip-interface** of **PBX realm.** Auth challenges to INVITEs are handled on the **session-agent** to the **IP-PBX** via **auth-attributes**.

```
surrogate-agent
        register-host                           ipinet4.com
        register-user                           user123456
        description
        realm-id                                core
        state                                   enabled
        customer-host                           172.16.154.35
        customer-next-hop                       10.27.56.7
        register-contact-host                   ipinet4.com
        register-contact-user                   user123456
        password                                pass123456
        register-expires                        3600
        replace-contact                         disabled
        options                                 auth-info=refresh
                                                auth-
method="INVITE,CANCEL,ACK,BYE"
        route-to-registrar                      enabled
        aor-count                               1
        auth-user                               user123456
        max-register-attempts                   10
        register-retry-time                     300
        count-start                             1
        register-mode                           automatic
        triggered-inactivity-interval           30
        triggered-oos-response                  503
```

Reg-cache on the IPPBX sip-interface

```
sip-interface
        state                                   enabled
        realm-id                                core
        description
        sip-port
                address                                 172.16.153.34
                port                                    5060
                transport-protocol                      UDP
                tls-profile
                allow-anonymous                         all
                multi-home-addrs
                ims-aka-profile
        carriers
…
        tcp-nat-interval                        90
        registration-caching                    enabled
```

IP-PBX session-agent configuration

```
session-agent
        hostname                                172.16.149.38
        ip-address                              172.16.149.38
        port                                    5060
```

```
        state                                   enabled
        app-protocol                            SIP
…
        sip-isup-profile
        kpml-interworking                       inherit
        monitoring-filters
        auth-attributes
                auth-realm                              ipnet4.com
                username                                user123456
                password                                ********
                in-dialog-methods                       INVITE BYE ACK CANCEL
OPTIONS SUBSCRIBE PRACK NOTIFY UPDATE REFER
```

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                            peer
        description
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                                10.27.56.7
                realm                                   core
                action                                  none
                terminate-recursion                     disabled
                carrier
                start-time                              0000
                end-time                                2400
                days-of-week                            U-S
                cost                                    0
                state                                   enabled
                app-protocol                            SIP
                methods
                media-profiles
                lookup                                  single
                next-key
                eloc-str-lkup                           disabled
                eloc-str-match
local-policy
        from-address                            *
        to-address                              *
        source-realm                            core
        description
        activate-time
        deactivate-time
```

```
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                                172.16.149.38
                realm                                   peer
                action                                  none
                terminate-recursion                     disabled
                carrier
                start-time                              0000
                end-time                                2400
                days-of-week                            U-S
                cost                                    0
                state                                   enabled
                app-protocol                            SIP
                methods
                media-profiles
                lookup                                  single
                next-key
                eloc-str-lkup                           disabled
                eloc-str-match
```

Header manipulation rules required for the Telus Trunk

The HMRs update the host portion of the URI to the Telus 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.

```
    header-rule
                name                                    manipRURI
                header-name                             request-uri
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods                                 INVITE
                match-value
                new-value
                element-rule
                        name                                    modRURI
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               ipnet4.com
        header-rule
                name                                    manipFrom
                header-name                             From
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
```

```
            new-value
            element-rule
                    name                                    From
                    parameter-name
                    type                                    uri-host
                    action                                  replace
                    match-val-type                          any
                    comparison-type                         case-sensitive
                    match-value
                    new-value                               ipnet4.com
    header-rule
            name                                    manipTo
            header-name                             To
            action                                  manipulate
            comparison-type                         case-sensitive
            msg-type                                any
            methods
            match-value
            new-value
            element-rule
                    name                                    To
                    parameter-name
                    type                                    uri-host
                    action                                  replace
                    match-val-type                          any
                    comparison-type                         case-sensitive
                    match-value
                    new-value                               $REMOTE IP
    header-rule
            name                                    maniPassert
            header-name                             P-Asserted-Identity
            action                                  manipulate
            comparison-type                         case-sensitive
            msg-type                                any
            methods
            match-value
            new-value
            element-rule
                    name                                    chgDisplay
                    parameter-name
                    type                                    uri-host
                    action                                  replace
                    match-val-type                          any
                    comparison-type                         case-sensitive
                    match-value
                    new-value                               ipnet4.com
```

Contact header handling via HMRs

Internal calls on theCS1Kthat are transferred to the PSTN have the endpoint extension only in the contact header. This set of header manipulation rules normalizes the contact header user portion of the URI by copying the user uri from the P-Asserted-Identity header and replacing the contact uri user.

```
    header-rule
            name                                    StrPAIURIUsr
```

```
                header-name                             P-Asserted-Identity
                action                                  store
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    StrPAIURIUsr
                        parameter-name
                        type                                    uri-user
                        action                                  store
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value
        header-rule
                name                                    UpdtContact
                header-name                             Contact
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    UpdtCtactHost
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               $LOCAL IP
                element-rule
                        name                                    UpdtCtactUsr
                        parameter-name
                        type                                    uri-user
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value
$StrPAIUriHost.$StrPAI
```

Removing headers to Telus Trunks

HMRs are required to standardize messages to Telus SIP trunks removing Alert-Info, History-Info, P-Charging-Vector, P-Location, and P-AV-Message-ID.

```
        header-rule
                name                                    DelAlrtInfo
                header-name                             Alert-Info
                action                                  delete
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
        header-rule
                name                                    DelHstInfo
```

```
                header-name                     History-Info
                action                          delete
                comparison-type                 case-sensitive
                msg-type                        any
                methods
                match-value
                new-value
        header-rule
                name                            DelPChg
                header-name                     P-Charging-Vector
                action                          delete
                comparison-type                 case-sensitive
                msg-type                        any
                methods
                match-value
                new-value
        header-rule
                name                            DelPLocation
                header-name                     P-Location
                action                          delete
                comparison-type                 case-sensitive
                msg-type                        any
                methods
                match-value
                new-value
        header-rule
                name                            DelPAV
                header-name                     P-AV-Message-Id
                action                          delete
                comparison-type                 case-sensitive
                msg-type                        any
                methods
                match-value
                new-value
```

Webserver Configuration

A webserver is available on all Enterprise versions of Oracle 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

Open items:

1) T.38 does not appear to be supported on CS1K. Fax over G.711 was tested and passed.

Following is the test plan executed against this setup and results have been documented below.

	Test Case	**Test result**
CPE outbound to SP Offnet gateway(PSTN) (G.729 is offered first)		
	Call ringback	pass
	voice cut through on connect	pass
	ring terminated on calling party disconnect	pass
	long duration call: 1 hour	
	DTMF relay (both directions)	pass
	Called party disconnect, calling party automatically disconnected	pass
SP offnet gateway (PSTN) inbound to CPE (G.729 offered first)		
	Call ringback	pass
	voice cut through on connect	pass
	ring terminated on calling party disconnect	pass
	long duration call: 1 hour	
	DTMF relay (both directions)	pass
	Called party disconnect, calling party automatically disconnected	pass
CPE to CPE (place call out to the SP network and back) (G.729 is offered first)		
	Call ringback	pass
	voice cut through on connect	pass
	ring terminated on calling party disconnect	pass
	long duration call: 1 hour	
	DTMF relay (both directions)	pass
	Called party disconnect, calling party automatically disconnected	pass
CPE Calling number privacy		
	Pass calling number: IP PBX to Offnet Mark Calling Number Private	pass

	Pass calling number: IP PBX to another IP PBX: Mark Calling Number Private	
CPE Telephone Number Support		
	IP PBX to offnet: translate private extension to 10 DID calling number	pass
	Offnet to IP PBX: IP PBX must translate 10 digit called number to private extension.	pass
	IP PBX to IP PBX: translate private extension to 10 DID calling number	pass
	IP PBX to IP PBX: IP PBX must translate 10 digit called number to private extension.	pass
	Offnet to IP PBX: IP PBX must translate 4 digit called number to private extension	pass
	IP PBX to IP PBX: IP PBX must translate 4 digit called number to private extension	pass
CPE Calling Name Delivery		
	IP PBX to IP PBX: pass display name	pass
CPE offnet Call Conference		
	Offnet1 to IP PBX phone 1, IP PBX phone1 conferences Offnet2	pass
	IP PBX phone1 to Offnet1, IP PBX phone1 conferences Offnet2	pass
CPE Intra-Site Call Conference		
	Phone1 to Phone2. Phone1 conferences Offnet PSTN	pass
	Phone1 to Offnet PSTN. Phone 1 conferences Phone2	pass
	Offnet PSTN to Phone1. Phone1 conferences Phone2	pass
CPE Intra-Site Attended Call Transfer		
	Offnet 1 to IP PBX phone 1, IP PBX phone1 transfers to Offnet2 (does caller ID update on Offnet2?)	pass
	IP PBX phone1 to Offnet1, IP PBX phone1 transfers to Offnet 2 (does caller ID update on Offnet2?)	pass
	Phone1 to Phone2. Phone1 transfers to Offnet PSTN	pass
	Phone1 to Offnet PSTN. Phone 1 transfers to Phone2	pass
	Offnet PSTN to Phone1. Phone1 transfers to Phone2	pass

CPE Intra-Site Unattended Call Transfer		
	Offnet 1 to IP PBX phone 1, IP PBX phone1 transfers to Offnet2 (does caller ID update on Offnet2?)	pass
	IP PBX phone1 to Offnet1, IP PBX phone1 transfers to Offnet 2 (does caller ID update on Offnet2?)	pass
	Phone1 to Phone2. Phone1 transfers to Phone3 at 2nd IP PBX site	pass
	Phone1 to Phone2. Phone1 transfers to Offnet PSTN	pass
	Phone1 to Offnet PSTN. Phone 1 transfers to Phone2	pass
	Offnet PSTN to Phone1. Phone1 transfers to Phone2	pass
CPE Call Hold and Resume (call hold is always done on the IP PBX side)		
	IP PBX to Offnet PSTN	pass
	Offnet PSTN to IP PBX	pass
CPE Voice Mail		
	Offnet to IP PBX: leave voice mail	
	Offnet to IP PBX: retrieve voice mail	
SP Voice Mail (e.g. using mobile phone (Vz or at&t) voicemail)		
	IP PBX to Offnet (mobile VM): leave voice mail	pass
	IP PBX to Offnet (mobile VM): retrieve voice mail	pass
CPE Find Me (Call Forward Unconditionally		
	Offnet to IP PBX call invokes to find me feature	pass
	IP PBX to IP PBX call invokes to find me feature	pass
	Offnet to IP PBX phone1 call invokes find me feature to offnet	pass
	IP PBX to IP PBX phone1 call invokes find me feature to offnet	pass
CPE Find Me (Call Forward On Busy)		
	Offnet to IP PBX phone1 call invokes find me feature to phone2	pass

	Offnet to IP PBX phone1 call invokes find me feature to offnet	pass
	IP PBX to IP PBX phone1 call invokes find me feature to phone2	pass
	IP PBX to IP PBX phone1 call invokes find me feature to offnet	pass
CPE Find Me (Call Forward Don't Answer)		
	Offnet to IP PBX phone1 call invokes find me feature to phone2	pass
	Offnet to IP PBX phone1 call invokes find me feature to offnet	pass
	IP PBX to IP PBX phone1 call invokes find me feature to phone2	pass
	IP PBX to IP PBX phone1 call invokes find me feature to offnet	pass
Codec mid-call re-negotiation (to be tested without transcoder)		
	Offnet calls IP PBX phone 1 (G729), phone 1 transfers to UM/gateway (g711u). Offnet and IP PBX UM/gateway re-negotiate codec and call is transferred.	pass
	IP PBX phone 1 calls Offnet phone (call is G711), offnet phone transfers call to IP PBX phone 2 (G729 region), calls sets up between IP PBX phone1 and IP PBX phone2	pass
Dial Plans		
	Test 0, 0+10, 911, 411 1+10	pass
PRACK with SDP (early-media cut-through with DTMF (RFC2833) navigation before 200OK)) - call 800-864-8331 - United Airlines		
	IP PBX phone1 call 800 number, phone user navigates through AA to reach correct menu option.	pass

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:

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

Examining 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 TLAB-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

```
Local-policy
        from-address                            *
        to-address                              *
        source-realm                            peer
        description
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                                10.27.56.7
                realm                                   core
                action                                  none
                terminate-recursion                     disabled
                carrier
                start-time                              0000
                end-time                                2400
                days-of-week                            U-S
                cost                                    0
                state                                   enabled
                app-protocol                            SIP
                methods
                media-profiles
                lookup                                  single
                next-key
                eloc-str-lkup                           disabled
                eloc-str-match
local-policy
        from-address                            *
        to-address                              *
        source-realm                            core
        description
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                                172.16.149.38
                realm                                   peer
                action                                  none
                terminate-recursion                     disabled
                carrier
```

```
                start-time                              0000
                end-time                                2400
                days-of-week                            U-S
                cost                                    0
                state                                   enabled
                app-protocol                            SIP
                methods
                media-profiles
                lookup                                  single
                next-key
                eloc-str-lkup                           disabled
                eloc-str-match
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                           disabled
        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
media-policy
        name                                    G711
network-interface
        name                                    S0P0
        sub-port-id                             0
        description                             Outside/Untrusted
        hostname
```

```
        ip-address                              172.16.153.24
        pri-utility-addr                        172.16.153.2
        sec-utility-addr                        172.16.153.3
        netmask                                 255.255.255.0
        gateway                                 172.16.153.1
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        signaling-mtu                           0
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
network-interface
        name                                    S1P0
        sub-port-id                             0
        description                             Inside/Trusted
        hostname
        ip-address                              172.16.154.25
        pri-utility-addr                        172.16.154.2
        sec-utility-addr                        172.16.154.3
        netmask                                 255.255.255.0
        gateway                                 172.16.154.1
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        signaling-mtu                           0
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
network-interface
        name                                    wancom1
        sub-port-id                             0
```

```
        description                             HA HEARTBEAT1
        hostname
        ip-address
        pri-utility-addr                        169.254.1.1
        sec-utility-addr                        169.254.1.2
        netmask                                 255.255.255.252
        gateway
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
network-interface
        name                                    wancom2
        sub-port-id                             0
        description                             HA HEARTBEAT2
        hostname
        ip-address
        pri-utility-addr                        169.254.2.1
        sec-utility-addr                        169.254.2.2
        netmask                                 255.255.255.252
        gateway
        sec-gateway
        gw-heartbeat
                state                                   disabled
                heartbeat                               0
                retry-count                             0
                retry-timeout                           1
                health-score                            0
        dns-ip-primary
        dns-ip-backup1
        dns-ip-backup2
        dns-domain
        dns-timeout                             11
        hip-ip-list
        ftp-address
        icmp-address
        snmp-address
        telnet-address
        ssh-address
        server
phy-interface
        name                                    s0p0
```

```
        operation-type                  Media
        port                            0
        slot                            0
        virtual-mac
        admin-state                     enabled
        auto-negotiation                enabled
        duplex-mode                     FULL
        speed                           100
        wancom-health-score             50
        overload-protection             disabled
phy-interface
        name                            s1p0
        operation-type                  Media
        port                            0
        slot                            1
        virtual-mac
        admin-state                     enabled
        auto-negotiation                enabled
        duplex-mode                     FULL
        speed                           100
        wancom-health-score             50
        overload-protection             disabled
realm-config
        identifier                      core
        description
        addr-prefix                     0.0.0.0
        network-interfaces              s0p0:0
        mm-in-realm                     enabled
        mm-in-network                   enabled
        mm-same-ip                      enabled
        mm-in-system                    enabled
        bw-cac-non-mm                   disabled
        msm-release                     disabled
        qos-enable                      enabled
        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
        refer-notify-provisional                none
        dyn-refer-term                          disabled
        codec-policy
        codec-manip-in-realm                    disabled
        codec-manip-in-network                  disabled
        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
realm-config
        identifier                              peer
        description
        addr-prefix                             0.0.0.0
        network-interfaces                      s1p0:0
        mm-in-realm                             disabled
        mm-in-network                           enabled
        mm-same-ip                              enabled
        mm-in-system                            enabled
        bw-cac-non-mm                           disabled
        msm-release                             disabled
        qos-enable                              enabled
        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
        refer-notify-provisional                none
        dyn-refer-term                          disabled
        codec-policy
        codec-manip-in-realm                    disabled
        codec-manip-in-network                  disabled
        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
redundancy-config
        becoming-standby-time                   360000
        peer
                name                                    TLAB-SBC1
                type                                    Primary
                destination
                        address                                 169.254.1.1:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.1:9090
                        network-interface                       wancom2:0
        peer
                name                                    TLAB-SBC2
                type                                    Secondary
                destination
                        address                                 169.254.1.2:9090
                        network-interface                       wancom1:0
                destination
                        address                                 169.254.2.2:9090
```

```
                        network-interface                       wancom2:0
session-agent
        hostname                                    172.16.149.38
        ip-address                                  172.16.149.38
        port                                        5060
        state                                       enabled
        app-protocol                                SIP
        app-type
        transport-method                            UDP
        realm-id                                    peer
        egress-realm-id
        description                                 CS1KTrunk
        carriers
        allow-next-hop-lp                           enabled
        constraints                                 disabled
        max-sessions                                0
        max-inbound-sessions                        0
        max-outbound-sessions                       0
        max-burst-rate                              0
        max-inbound-burst-rate                      0
        max-outbound-burst-rate                     0
        max-sustain-rate                            0
        max-inbound-sustain-rate                    0
        max-outbound-sustain-rate                   0
        min-seizures                                5
        min-asr                                     0
        time-to-resume                              0
        ttr-no-response                             0
        in-service-period                           0
        burst-rate-window                           0
        sustain-rate-window                         0
        req-uri-carrier-mode                        None
        proxy-mode
        redirect-action
        loose-routing                               enabled
        send-media-session                          enabled
        response-map
        ping-method
        ping-interval                               30
        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                              ipnet4.com
                username                                user123456
                password                                ********
                in-dialog-methods                       INVITE BYE ACK CANCEL
OPTIONS SUBSCRIBE PRACK NOTIFY UPDATE REFER
        session-recording-server
        session-recording-required              disabled
session-agent
        hostname                                10.27.56.7
        ip-address                              10.27.56.7
        port                                    5060
        state                                   enabled
        app-protocol                            SIP
        app-type
        transport-method                        UDP
        realm-id                                core
        egress-realm-id
        description                             Telus Core Trunk
        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;hops=0
        ping-interval                           30
        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                       TELUStoCS1K
        out-manipulationid                      CS1KtoTELUS
        manipulation-string
        manipulation-pattern
        p-asserted-id
        trunk-group
        max-register-sustain-rate               0
        early-media-allow
        invalidate-registrations                disabled
        rfc2833-mode                            none
        rfc2833-payload                         0
        codec-policy
        enforcement-profile
        refer-call-transfer                     disabled
        refer-notify-provisional                none
        reuse-connections                       NONE
        tcp-keepalive                           none
        tcp-reconn-interval                     0
        max-register-burst-rate                 0
        register-burst-window                   0
        sip-profile
        sip-isup-profile
        kpml-interworking                       inherit
        monitoring-filters
        session-recording-server
        session-recording-required              disabled
sip-config
```

```
        state                                enabled
        operation-mode                       dialog
        dialog-transparency                  enabled
        home-realm-id                        peer
        egress-realm-id                      peer
        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                              max-udp-length=0
        add-reason-header                    disabled
        sip-message-len                      4096
        enum-sag-match                       disabled
        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
sip-interface
        state                                   enabled
        realm-id                                core
        description
        sip-port
                address                                 172.16.153.34
                port                                    5060
                transport-protocol                      UDP
                tls-profile
                allow-anonymous                         all
                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                            30
        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
        out-manipulationid
        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
        ims-aka-feature                         disabled
        enforcement-profile
        route-unauthorized-calls
        tcp-keepalive                           none
        add-sdp-invite                          reinvite
        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
sip-interface
        state                                   enabled
        realm-id                                peer
        description
        sip-port
                address                                 172.16.154.35
                port                                    5060
                transport-protocol                      UDP
                tls-profile
                allow-anonymous                         all
                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                            30
        tcp-nat-interval                        90
        registration-caching                    disabled
```

```
min-reg-expire                          300
registration-interval                   3600
route-to-registrar                      disabled
secured-network                         disabled
teluri-scheme                           disabled
uri-fqdn-domain
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
out-manipulationid
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
ims-aka-feature                         disabled
enforcement-profile
route-unauthorized-calls
tcp-keepalive                           none
add-sdp-invite                          disabled
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
sip-manipulation
        name                                    CS1KtoTELUS
        description                             Calls to SIP PSTN
        split-headers
        join-headers
        header-rule
                name                                    manipRURI
                header-name                             request-uri
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods                                 INVITE
                match-value
                new-value
                element-rule
                        name                                    modRURI
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               ipnet4.com
        header-rule
                name                                    manipFrom
                header-name                             From
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    From
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               ipnet4.com
        header-rule
                name                                    manipTo
                header-name                             To
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
```

```
                new-value
                element-rule
                        name                                    To
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               $REMOTE IP
        header-rule
                name                                    maniPassert
                header-name                             P-Asserted-Identity
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    chgDisplay
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               ipnet4.com
        header-rule
                name                                    StrPAIURIUsr
                header-name                             P-Asserted-Identity
                action                                  store
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    StrPAIURIUsr
                        parameter-name
                        type                                    uri-user
                        action                                  store
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value
        header-rule
                name                                    UpdtContact
                header-name                             Contact
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
```

```
                        name                                    UpdtCtactHost
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               $LOCAL IP
                element-rule
                        name                                    UpdtCtactUsr
                        parameter-name
                        type                                    uri-user
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value
$StrPAIUriHost.$StrPAI
        header-rule
                name                                    DelAlrtInfo
                header-name                             Alert-Info
                action                                  delete
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
        header-rule
                name                                    DelHstInfo
                header-name                             History-Info
                action                                  delete
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
        header-rule
                name                                    DelPChg
                header-name                             P-Charging-Vector
                action                                  delete
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
        header-rule
                name                                    DelPLocation
                header-name                             P-Location
                action                                  delete
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
        header-rule
                name                                    DelPAV
```

```
                header-name                             P-AV-Message-Id
                action                                  delete
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value

sip-manipulation
        name                                    TELUStoCS1K
        description
        split-headers
        join-headers
        header-rule
                name                                    modRURI
                header-name                             request-uri
                action                                  manipulate
                comparison-type                         case-sensitive
                msg-type                                any
                methods
                match-value
                new-value
                element-rule
                        name                                    modRURI
                        parameter-name
                        type                                    uri-host
                        action                                  replace
                        match-val-type                          any
                        comparison-type                         case-sensitive
                        match-value
                        new-value
mlabs.teluslabs.net
sip-monitoring
        match-any-filter                        disabled
        state                                   enabled
        short-session-duration                  0
        monitoring-filters                      *
        trigger-window                          30
snmp-community
        community-name                          sbc
        access-mode                             READ-ONLY
        ip-addresses                            192.168.1.1
                                                192.168.2.1
                                                192.168.3.1
                                                192.168.4.1
steering-pool
        ip-address                              172.16.153.34
        start-port                              65000
        end-port                                65535
        realm-id                                core
        network-interface
steering-pool
        ip-address                              172.16.154.35
        start-port                              65000
        end-port                                65535
        realm-id                                peer
```

```
        network-interface
surrogate-agent
        register-host                           ipinet4.com
        register-user                           user123456
        description
        realm-id                                core
        state                                   enabled
        customer-host                           172.16.154.35
        customer-next-hop                       10.27.56.7
        register-contact-host                   ipinet4.com
        register-contact-user                   user123456
        password                                pass123456
        register-expires                        3600
        replace-contact                         disabled
        options                                 auth-info=refresh
                                                auth-
method="INVITE,CANCEL,ACK,BYE"
        route-to-registrar                      enabled
        aor-count                               1
        auth-user                               user123456
        max-register-attempts                   10
        register-retry-time                     300
        count-start                             1
        register-mode                           automatic
        triggered-inactivity-interval           30
        triggered-oos-response                  503
system-config
        hostname                                TLAB-SBC1
        description                             TLAB SBC
        location                                Voice Lab
        mib-system-contact
        mib-system-name
        mib-system-location
        snmp-enabled                            enabled
        enable-snmp-auth-traps                  disabled
        enable-snmp-syslog-notify               disabled
        enable-snmp-monitor-traps               disabled
        enable-env-monitor-traps                disabled
        snmp-syslog-his-table-length            1
        snmp-syslog-level                       WARNING
        system-log-level                        WARNING
        process-log-level                       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                         0.0.0.0
        restart                                 enabled
        exceptions
        telnet-timeout                          3600
        console-timeout                         1800
        remote-control                          enabled
        cli-audit-trail                         enabled
        link-redundancy-state                   disabled
        source-routing                          disabled
        cli-more                                disabled
        terminal-height                         24
        debug-timeout                           0
        trap-event-lifetime                     0
        ids-syslog-facility                     -1
        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
web-server-config
        state                                   enabled
        inactivity-timeout                      5
        http-state                              enabled
        http-port                               80
        https-state                             disabled
        https-port                              443
        tls-profile
```

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

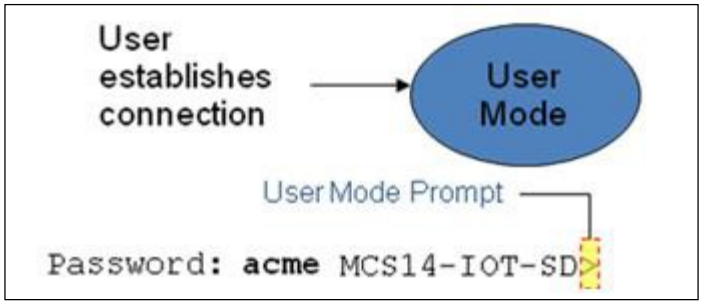
- SSH, this must be explicitly configured.

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

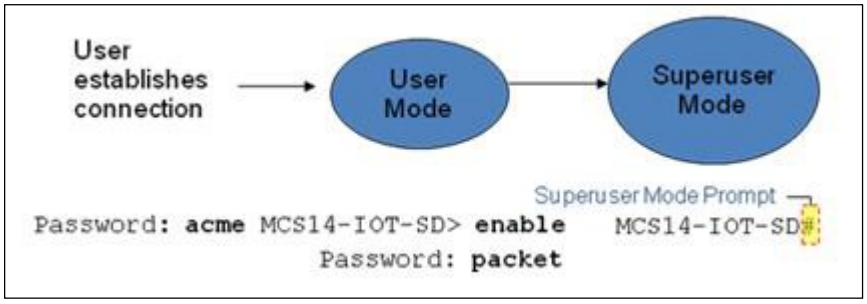
ACLI Basics

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.



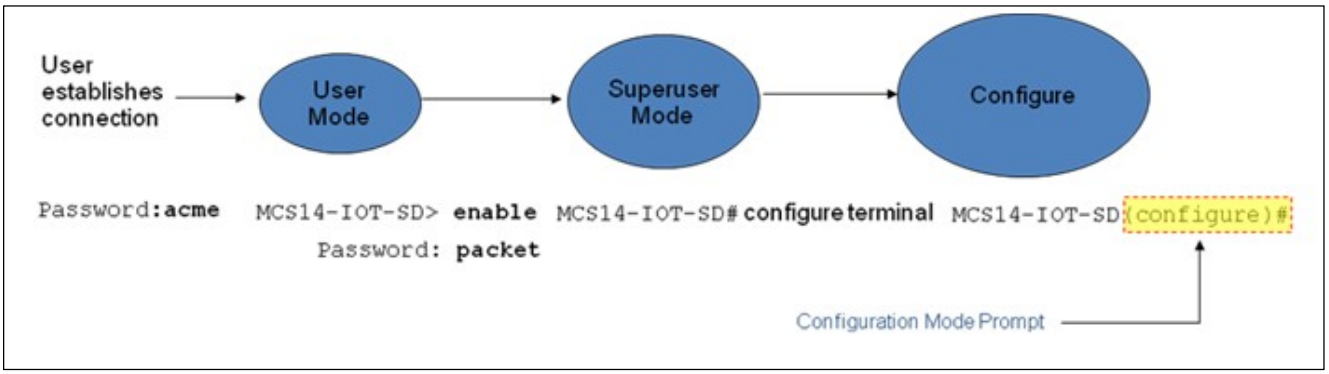
The Superuser mode allows for access to all system commands for operation, maintenance, and administration. This mode is identified by the pound sign (#) in the prompt after the target name. To enter the Superuser mode, issue the enable command in the User mode.



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.

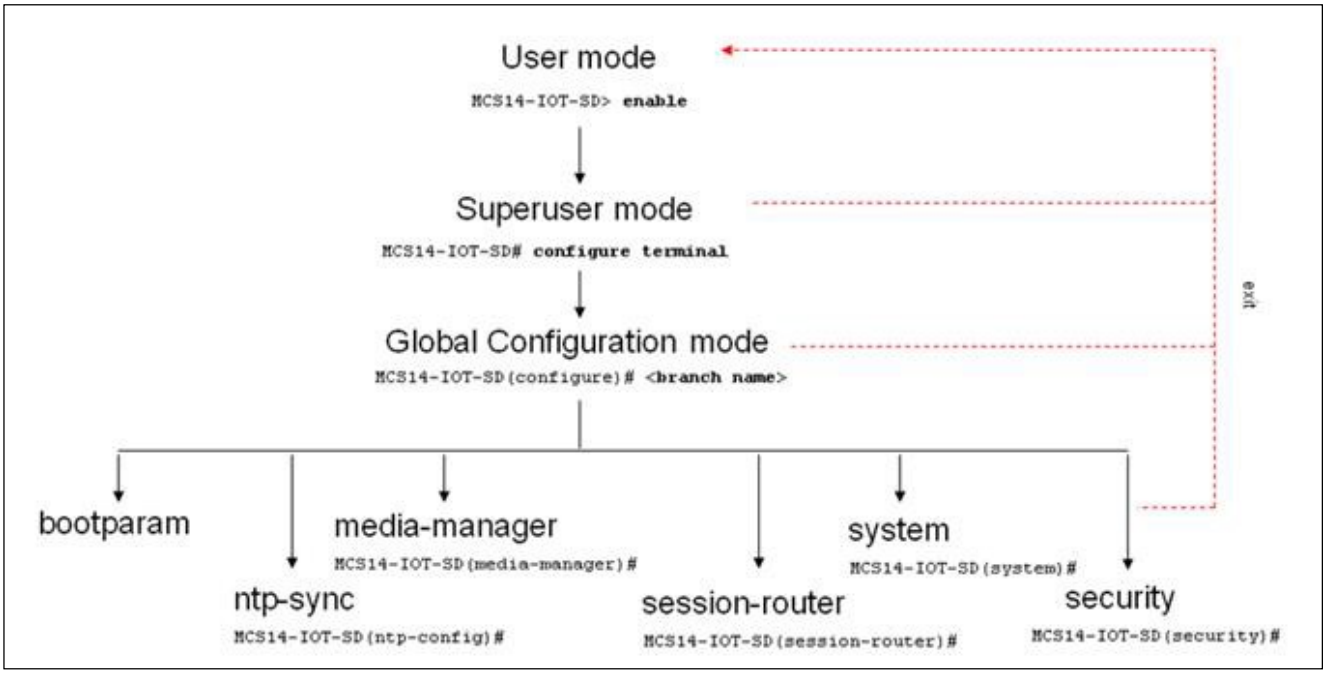
You must enter the Configuration mode to configure elements. For example, you can access the configuration branches and configuration elements for signaling and media configurations. To enter the Configuration mode, issue the **`configure terminal`** command in the Superuser mode.

Configuration mode is identified by the word configure in parenthesis followed by the pound sign (#) in the prompt after the target name, for example, **`TLAB-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.

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

2. 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.
3. 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.
4. 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.
5. On completion, you must issue the **`done`** command.
6. 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,

1. Enter the **`no`** command from within the path for that specific element
2. Issue the **`exit`** command.

To delete a multiple-instance element,

1. Enter the **`no`** command from within the path for that particular element.
   The key field prompt, such as <name>:<sub-port-id>, appears.
2. Use the <Enter> key to display a list of the existing configured elements.
3. Enter the number corresponding to the element you wish to delete.
4. 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 last 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.

```
TLAB-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'.
TLAB-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.

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

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