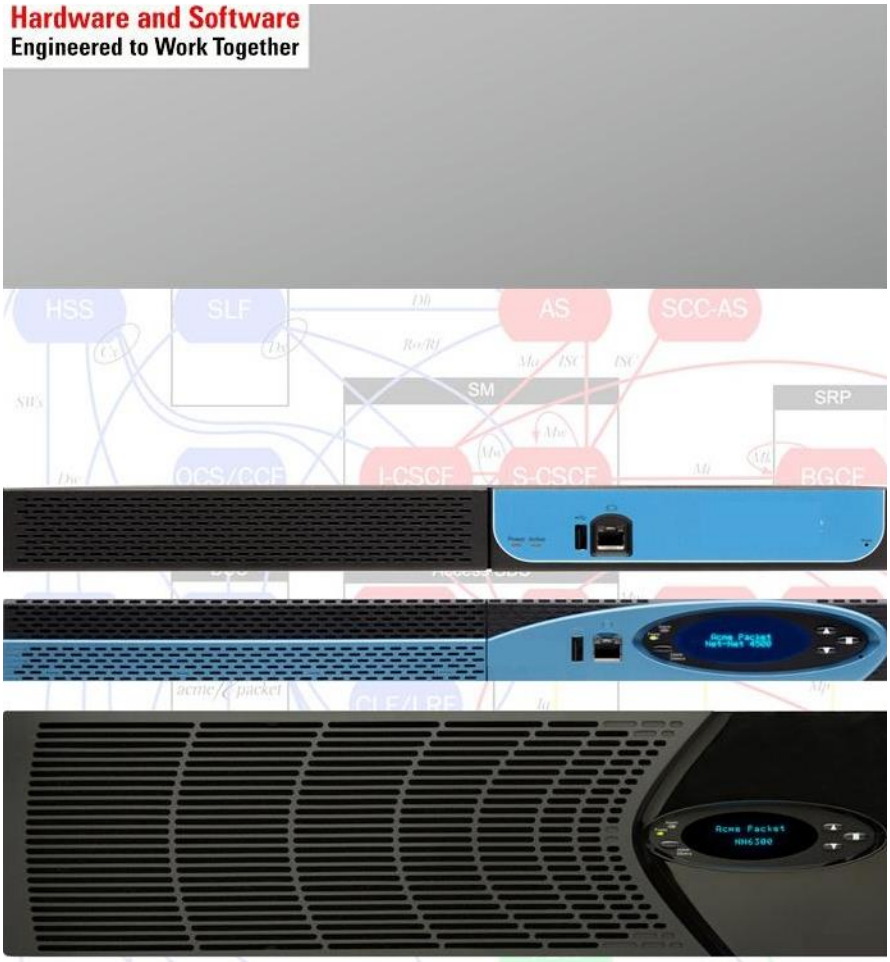

SIP Trunking with Oracle Enterprise Session Border Controller with ECZ7.2 and Genesys SIP Server 8.1

Technical Application Note

Disclaimer

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

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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 Communications Enterprise Session Border Controller.

Document Overview

SIP Server is the Genesys software component that provides an interface between your telephony hardware and the rest of the Genesys software components in your enterprise. It translates and keeps track of events and requests that come from, and are sent to the telephony device. SIP Server is a TCP/IP-based server that can also act as a messaging interface between SIP Server clients. It is the critical point in allowing your Genesys solution to facilitate and track the contacts that flow through your enterprise. 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 Genesys SIP Server, E-SBCs and IP Trunking services are configured in the optimal manner.

Introduction

Audience

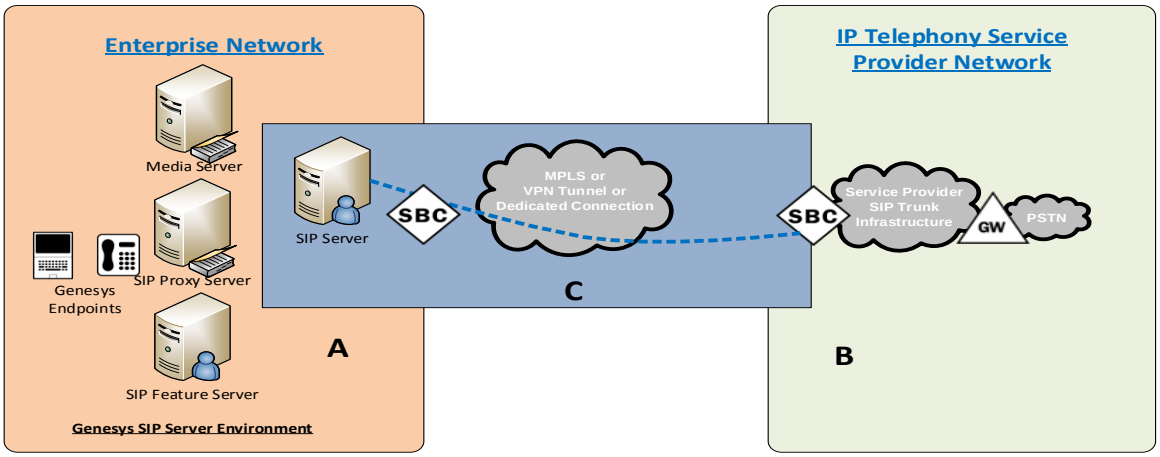
This is a technical document intended for telecommunications engineers with the purpose of configuring the Oracle Enterprise Session Border Controller and the Genesys SIP Server. There will be steps that require navigating the Acme Packet Command Line Interface (ACLI). Understanding the basic concepts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

Requirements

- Fully functioning Genesys SIP Server deployment, including Media Server, SIP Proxy and SIP Feature Server
- Genesys SIP Server, Version 8.1.1
- Genesys Media Server, Version 8.1.7
- Genesys SIP Proxy Server, Version 8.1.1
- Genesys SIP Feature Server, Version 8.1.1
- Oracle Enterprise Session Border Controller - Acme Packet 3820 platform running ECZ720p1.32.bz. Note: the configuration running on the E-SBC is backward/forward compatible with any release in the 7.2.0 stream.

Architecture

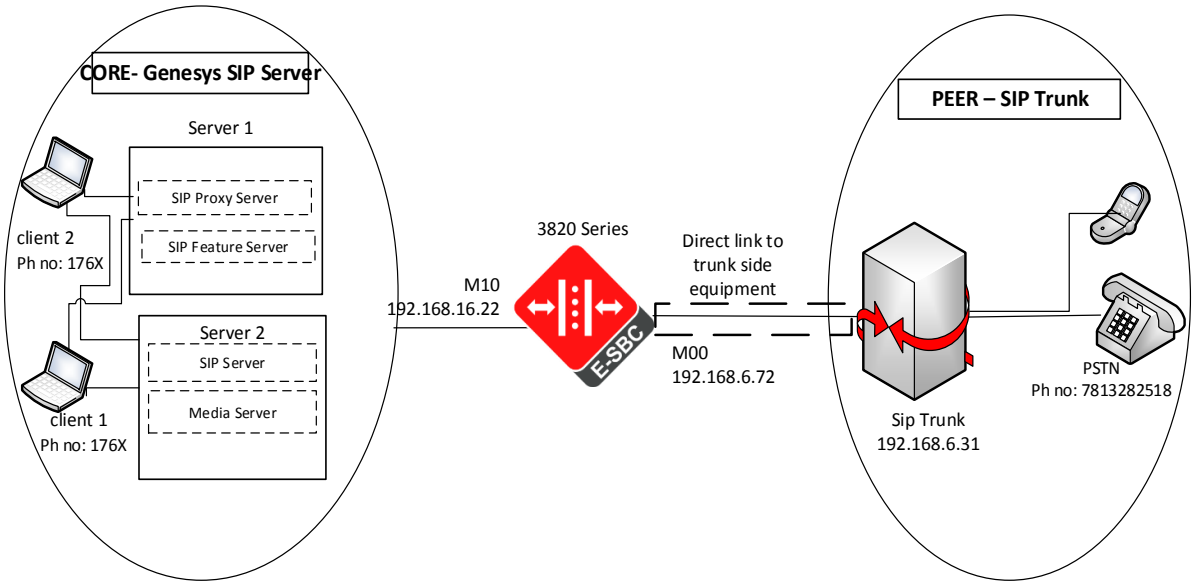
The following reference architecture shows a logical view of the connectivity between the SIP Server and the E-SBC.



Area A represents the customer's on-premise infrastructure, which includes the SIP Server, SIP Proxy server, Media Server and SIP Feature Server. Area B represents the service provider infrastructure which provides PSTN service via the SIP trunk. Area C represents the integration of these two environments over an IP network. This could be, through a VPN tunnel over the Internet, an MPLS managed network, or even a dedicated physical connection. The Genesys SIP Server and the E-SBC are the edge components that form the boundary of the SIP trunk. The configuration, validation and troubleshooting of the E-SBC to work with the Genesys SIP Server will be described in this document

Lab Configuration

The following diagram, similar to the Reference Architecture described earlier in this document, illustrates the lab environment created to facilitate certification testing.



Configuring the Oracle Enterprise Session Border Controller (E-SBC)

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

In Scope

The following guide configuring the 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 and is adding SIP Server customers, then please see the ACLI Configuration Guide on http://docs.oracle.com/cd/E56581_01/index.htm for a better understanding of the Command Line Interface (CLI).

Note that Oracle offers several models of E-SBCs. This document covers the setup for the Acme Packet 3820 platform running ECZ7.2.0 or later. If instructions are needed for other E-SBC models, please contact your Oracle representative.

Out of Scope

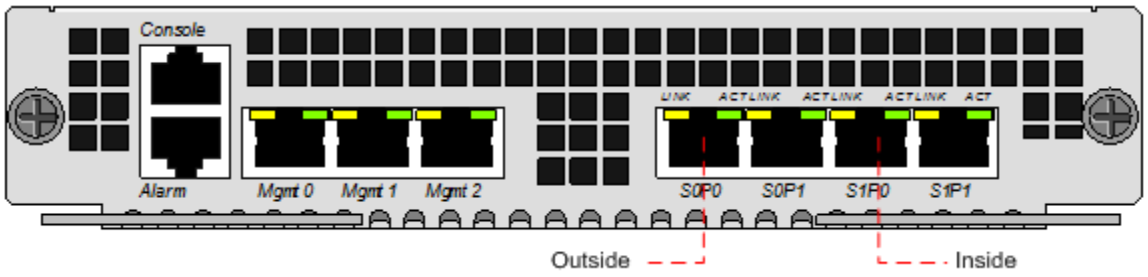
- Configuration of Network management including SNMP and RADIUS

What will you need

- Serial Console cross over cable with RJ-45 connector
- Terminal emulation application such as PuTTY or HyperTerm
- Passwords for the User and Superuser modes on the E-SBC
- IP address to be assigned to management interface (Wancom0) of the E-SBC - the Wancom0 management interface must be connected and configured to a management network separate from the service interfaces. Otherwise the E-SBC is subject to ARP overlap issues, loss of system access when the network is down, and compromising DDoS protection. Oracle does not support E-SBC configurations with management and media/service interfaces on the same subnet.
- IP address of Mediation Server external facing NIC
- IP addresses to be used for the E-SBC internal and external facing ports (Service Interfaces)
- IP address of the next hop gateway in the service provider network
- IP address of the enterprise DNS server

Configuring the E-SBC

Once the E-SBC is racked and the power cable connected, you are ready to set up physical network connectivity.



Plug the slot 0 port 0 (s0p0) interface into your outside (gateway facing) network and the slot 1 port 0 (s1p0) interface into your inside (mediation server-facing) network. Once connected, perform you are ready to power on and perform the following steps.

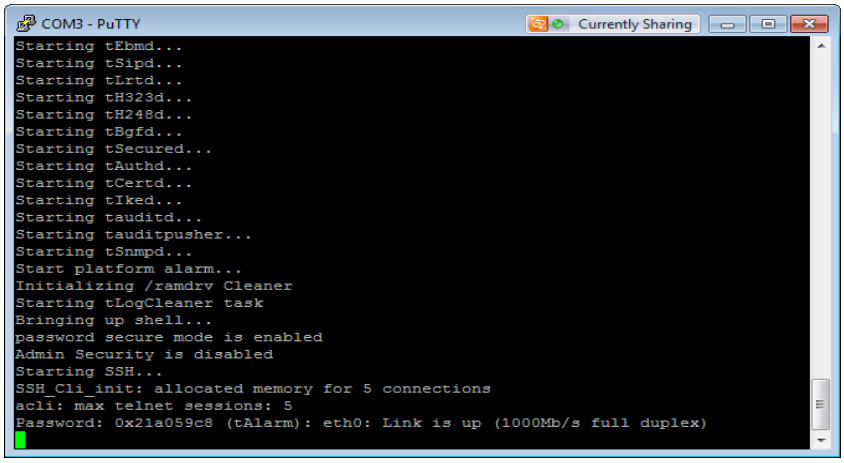
All commands are in bold, such as **`configure terminal`**; parameters in bold red such as 3820A-Genesys-IOT are parameters which are specific to an individual deployment. **Note:** The ACLI is case sensitive.

Establish the serial connection and logging in the E-SBC

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

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

Power on the E-SBC and confirm that you see the following output from the bootup sequence.



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

```
Password: acme
3820A-Genesys-IOT> enable
Password: packet
3820A-Genesys-IOT# configure terminal
3820A-Genesys-IOT(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

3820A-Genesys-IOT#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

```
3820A-Genesys-IOT#(configure)bootparam
'.' = clear field;  '-' = go to previous field;  q = quit
boot device             : eth0
processor number        : 0
host name               : acmesystem
file name               : /boot/ ECZ720p1.32.bz --- >location where the
software is loaded on the SBC
inet on ethernet (e)    : 172.18.255.52: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)         : 172.18.0.1 --- > gateway address here
user (u)                 : vxftp
ftp password (pw) (blank = use rsh)     : vxftp
flags (f)                :
target name (tn)         : 3820A-Genesys-IOT
startup script (s)       :
other (o)                :
```

SIP Trunking Configuration for the E-SBC

The following section shows the E-SBC configuration required to work with Genesys SIP Server and the SIP trunk. The protocol used between the E-SBC and SIP server is UDP for signaling and RTP for media; the SIP trunk is configured for UDP in this interop testing.

It is outside the scope of this document to include all the interoperability working information as it will differ in every deployment.

We have configured a sip-manipulation – NATting configured for topology hiding purposes.

Following is the complete SIP trunking configuration of the E-SBC:

```
local-policy
        from-address                            *
        to-address                              *
        source-realm                            Trunk
        description
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                                192.168.2.228
                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
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-04 16:09:01

local-policy
        from-address                            *
        to-address                              *
        source-realm                            core
        description
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                                192.168.6.31
                realm                                   Trunk
                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
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-04 16:08:04
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-signaling-bandwidth                 10000000
        max-untrusted-signaling                 100
        min-untrusted-signaling                 30
        app-signaling-bandwidth                 0
        tolerance-window                        30
        trap-on-demote-to-deny                  disabled
        trap-on-demote-to-untrusted             disabled
        syslog-on-demote-to-deny                disabled
        syslog-on-demote-to-untrusted           disabled
        rtcp-rate-limit                         0
        anonymous-sdp                           disabled
        arp-msg-bandwidth                       32000
        fragment-msg-bandwidth                  0
        rfc2833-timestamp                       disabled
        default-2833-duration                   100
        rfc2833-end-pkts-only-for-non-sig       enabled
        translate-non-rfc2833-event             disabled
        media-supervision-traps                 disabled
        dnsalg-server-failover                  disabled
        syslog-on-call-reject                   disabled
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-04 15:58:27
network-interface
        name                                    M00
        sub-port-id                             0
        description
```

```
        hostname
        ip-address                          192.168.6.72
        pri-utility-addr                    192.168.6.73
        sec-utility-addr                    192.168.6.74
        netmask                             255.255.255.0
        gateway                             192.168.6.1
        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                         192.168.6.72
        ftp-address
        icmp-address                        192.168.6.72
        snmp-address
        telnet-address
        ssh-address
        last-modified-by                    admin@172.21.17.23
        last-modified-date                  2014-11-04 15:57:54
network-interface
        name                                M10
        sub-port-id                         0
        description
        hostname
        ip-address                          192.168.16.222
        pri-utility-addr                    192.168.16.223
        sec-utility-addr                    192.168.16.224
        netmask                             255.255.255.0
        gateway                             192.168.16.1
        sec-gateway
        gw-heartbeat
                state                               disabled
                heartbeat                           0
                retry-count                         0
                retry-timeout                       1
```

```
                health-score                            0
        dns-ip-primary                          192.168.20.167
        dns-ip-backup1                          192.168.20.10
        dns-ip-backup2                          192.168.20.100
        dns-domain                              genesyslab.com
        dns-timeout                             11
        signaling-mtu                           0
        hip-ip-list                             192.168.16.222
        ftp-address
        icmp-address                            192.168.16.222
        snmp-address
        telnet-address
        ssh-address
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-04 15:57:28
network-interface
        name                            wancom1
        sub-port-id                     0
        description
        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
```

```
        signaling-mtu                   0
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-04 15:57:28
network-interface
        name                            wancom2
        sub-port-id                     0
        description
        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
        signaling-mtu                   0
        last-modified-by                admin@172.21.17.23
        last-modified-date              2014-11-04 09:01:08
phy-interface
        name                                    M00
        operation-type                          Media
        port                                    0
        slot                                    0
        virtual-mac                             00:08:25:04:0d:1e
        admin-state                             enabled
        auto-negotiation                        enabled
        duplex-mode                             FULL
```

```
        speed                                   100
        wancom-health-score                     50
        overload-protection                     disabled
        mac-filtering                           disabled
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-04 15:55:53
phy-interface
        name                                    M10
        operation-type                          Media
        port                                    0
        slot                                    1
        virtual-mac                             00:08:25:04:0d:1f
        admin-state                             enabled
        auto-negotiation                        enabled
        duplex-mode                             FULL
        speed                                   100
        wancom-health-score                     50
        overload-protection                     disabled
        mac-filtering                           disabled
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-04 15:56:14
phy-interface
        name                            wancom1
        operation-type                  Control
        port                            1
        slot                            0
        virtual-mac
        wancom-health-score             8
        overload-protection             disabled
        last-modified-by                admin@172.21.17.23
        last-modified-date              2014-11-04 15:56:14
phy-interface
        name                            wancom2
        operation-type                  Control
        port                            2
        slot                            0
        virtual-mac
        wancom-health-score             9
        overload-protection             disabled
        last-modified-by                admin@172.21.17.23
        last-modified-date              2014-11-04 15:56:14
realm-config
        identifier                                  Trunk
```

```
        description                          towards Trunk
        addr-prefix                          0.0.0.0
        network-interfaces                   M00:0
        mm-in-realm                          enabled
        mm-in-network                        enabled
        mm-same-ip                           enabled
        mm-in-system                         enabled
        bw-cac-non-mm                        disabled
        msm-release                          disabled
        qos-enable                           disabled
        generate-UDP-checksum                disabled
        max-bandwidth                        0
        fallback-bandwidth                   0
        max-priority-bandwidth               0
        max-latency                          0
        max-jitter                           0
        max-packet-loss                      0
        observ-window-size                   0
        parent-realm
        dns-realm
        media-policy
        media-sec-policy
        srtp-msm-passthrough                 disabled
        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                  enabled
        rtcp-policy
        constraint-name
        session-recording-server
        session-recording-required              disabled
        manipulation-string
        manipulation-pattern
        stun-enable                             disabled
        stun-server-ip                          0.0.0.0
        stun-server-port                        3478
        stun-changed-ip                         0.0.0.0
        stun-changed-port                       3479
        sip-profile
        sip-isup-profile
        match-media-profiles
        qos-constraint
        block-rtcp                              disabled
```

```
        hide-egress-media-update              disabled
        tcp-media-profile
        monitoring-filters
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type                        none
        last-modified-by                      admin@172.21.17.23
        last-modified-date                    2014-11-04 16:00:16
realm-config
        identifier                            core
        description                           towards Genesys SIP Server
        addr-prefix                           0.0.0.0
        network-interfaces                    M10:0
        mm-in-realm                           enabled
        mm-in-network                         enabled
        mm-same-ip                            enabled
        mm-in-system                          enabled
        bw-cac-non-mm                         disabled
        msm-release                           disabled
        qos-enable                            disabled
        generate-UDP-checksum                 disabled
        max-bandwidth                         0
        fallback-bandwidth                    0
        max-priority-bandwidth                0
        max-latency                           0
        max-jitter                            0
        max-packet-loss                       0
        observ-window-size                    0
        parent-realm
        dns-realm
        media-policy
        media-sec-policy
        srtp-msm-passthrough                  disabled
        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                  enabled
        rtcp-policy
        constraint-name
        session-recording-server
        session-recording-required              disabled
        manipulation-string
```

```
        manipulation-pattern
        stun-enable                             disabled
        stun-server-ip                          0.0.0.0
        stun-server-port                        3478
        stun-changed-ip                         0.0.0.0
        stun-changed-port                       3479
        sip-profile
        sip-isup-profile
        match-media-profiles
        qos-constraint
        block-rtcp                              disabled
        hide-egress-media-update                disabled
        tcp-media-profile
        monitoring-filters
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type                          none
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-04 15:59:30
redundancy-config
        state                           disabled
        log-level                       INFO
        health-threshold                75
        emergency-threshold             50
        port                            9090
        advertisement-time              500
        percent-drift                   210
        initial-time                    1250
        becoming-standby-time           180000
        becoming-active-time            100
        cfg-port                        1987
        cfg-max-trans                   10000
        cfg-sync-start-time             5000
        cfg-sync-comp-time              1000
        gateway-heartbeat-interval      10
        gateway-heartbeat-retry         3
        gateway-heartbeat-timeout       1
        gateway-heartbeat-health        1
        media-if-peercheck-time         0
        peer
                name                            3820B-Genesys-IOT
                state                           enabled
```

```
                type                            Secondary
                destination
                        address                         169.254.1.2:9090
                        network-interface               wancom1:0
                destination
                        address                         169.254.2.2:9090
                        network-interface               wancom2:0
        peer
                name                            3820A-Genesys-IOT
                state                           enabled
                type                            Primary
                destination
                        address                         169.254.1.1:9090
                        network-interface               wancom1:0
                destination
                        address                         169.254.2.1:9090
                        network-interface               wancom2:0
        last-modified-by                         admin@172.21.17.23
        last-modified-date                       2014-11-04 15:59:30
session-agent
        hostname                                 192.168.2.228
        ip-address                               192.168.2.228
        port                                     23846
        state                                    enabled
        app-protocol                             SIP
        app-type
        transport-method                         UDP
        realm-id                                 core
        egress-realm-id
        description
        carriers
        allow-next-hop-lp                        enabled
        constraints                              disabled
        max-sessions                             0
        max-inbound-sessions                     0
        max-outbound-sessions                    0
        max-burst-rate                           0
        max-inbound-burst-rate                   0
        max-outbound-burst-rate                  0
        max-sustain-rate                         0
        max-inbound-sustain-rate                 0
        max-outbound-sustain-rate                0
        min-seizures                             5
```

```
        min-asr                                 0
        time-to-resume                          0
        ttr-no-response                         0
        in-service-period                       0
        burst-rate-window                       0
        sustain-rate-window                     0
        req-uri-carrier-mode                    None
        proxy-mode
        redirect-action
        loose-routing                           enabled
        send-media-session                      enabled
        response-map
        ping-method
        ping-interval                           0
        ping-send-mode                          keep-alive
        ping-all-addresses                      disabled
        ping-in-service-response-codes
        out-service-response-codes
        load-balance-dns-query                  hunt
        options
        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
        session-recording-server
        session-recording-required            disabled
        last-modified-by                      admin@172.21.17.23
        last-modified-date                    2014-11-04 16:07:07
session-agent
        hostname                              192.168.6.31
        ip-address                            192.168.6.31
        port                                  5060
        state                                 enabled
        app-protocol                          SIP
        app-type
        transport-method                      UDP
        realm-id                              Trunk
        egress-realm-id
        description
        carriers
        allow-next-hop-lp                     enabled
        constraints                           disabled
        max-sessions                          0
        max-inbound-sessions                  0
        max-outbound-sessions                 0
        max-burst-rate                        0
        max-inbound-burst-rate                0
        max-outbound-burst-rate               0
        max-sustain-rate                      0
        max-inbound-sustain-rate              0
        max-outbound-sustain-rate             0
        min-seizures                          5
        min-asr                               0
        time-to-resume                        0
        ttr-no-response                       0
        in-service-period                     0
```

```
        burst-rate-window                       0
        sustain-rate-window                     0
        req-uri-carrier-mode                    None
        proxy-mode
        redirect-action
        loose-routing                           enabled
        send-media-session                      enabled
        response-map
        ping-method
        ping-interval                           0
        ping-send-mode                          keep-alive
        ping-all-addresses                      disabled
        ping-in-service-response-codes
        out-service-response-codes
        load-balance-dns-query                  hunt
        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
        session-recording-server
        session-recording-required              disabled
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-05 13:37:43
sip-config
        state                                   enabled
        operation-mode                          dialog
        dialog-transparency                     enabled
        home-realm-id                           core
        egress-realm-id
        auto-realm-id
        nat-mode                                None
        registrar-domain                        *
        registrar-host                          *
        registrar-port                          5060
        register-service-route                  always
        init-timer                              500
        max-timer                               4000
        trans-expire                            32
        initial-inv-trans-expire                0
        invite-expire                           180
        inactive-dynamic-conn                   32
        enforcement-profile
        pac-method
        pac-interval                            10
        pac-strategy                            PropDist
        pac-load-weight                         1
        pac-session-weight                      1
        pac-route-weight                        1
        pac-callid-lifetime                     600
        pac-user-lifetime                       3600
        red-sip-port                            1988
        red-max-trans                           10000
        red-sync-start-time                     5000
        red-sync-comp-time                      1000
        options                                 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
        last-modified-by                        admin@135.17.67.152
        last-modified-date                      2014-11-26 16:33:27
sip-interface
        state                                   enabled
        realm-id                                Trunk
        description
        sip-port
                address                                 192.168.6.72
                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                      NAT_IP
        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
        last-modified-by                      admin@172.21.17.23
        last-modified-date                    2014-11-19 14:47:52

sip-interface
        state                                 enabled
        realm-id                              core
        description
        sip-port
                address                               192.168.16.222
                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                      NAT_IP
        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
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-05 13:23:57
sip-manipulation
        name                                    NAT_IP
        description
        split-headers
        join-headers
        header-rule
                name                                    From
                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                          ip
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               $LOCAL_IP
        header-rule
                name                                    To
                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                          ip
                        comparison-type                         case-sensitive
                        match-value
                        new-value                               $REMOTE_IP
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-11 14:53:48

steering-pool
        ip-address                              192.168.16.222
        start-port                              50200
        end-port                                51200
        realm-id                                core
        network-interface
        last-modified-by                        admin@172.21.17.23
```

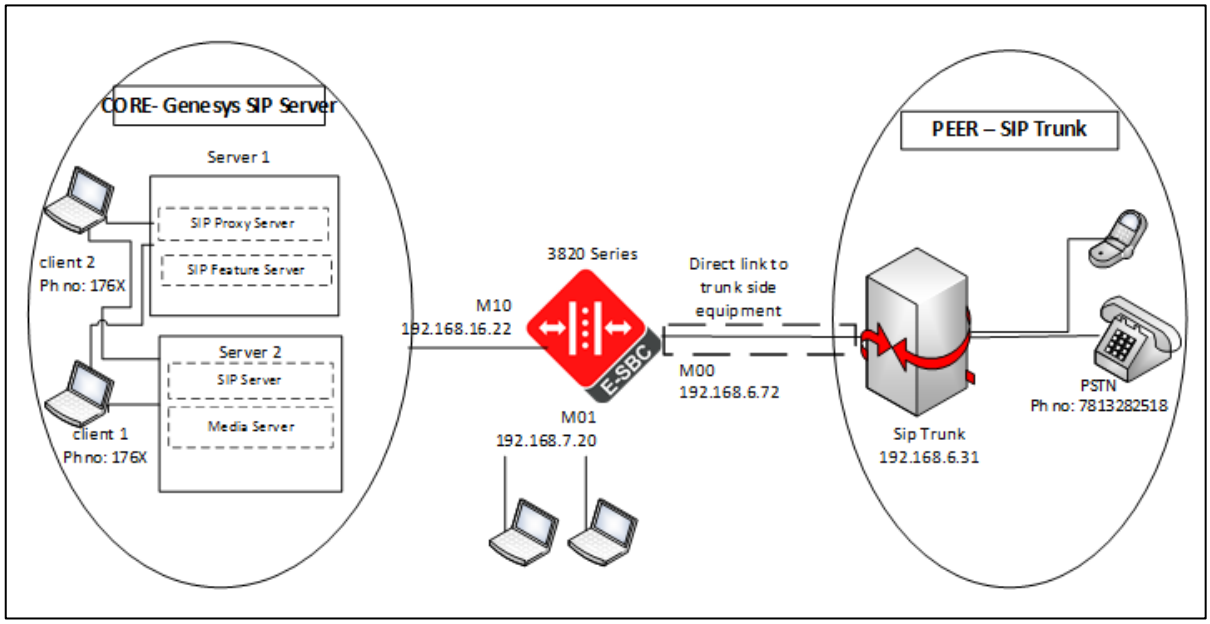
```
        last-modified-date                      2014-11-04 16:02:31

steering-pool
        ip-address                              192.168.6.72
        start-port                              50200
        end-port                                51200
        realm-id                                Trunk
        network-interface
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-19 14:49:43
system-config
        hostname                                Genesys-SBC
        description                             3820A-Genesys-IOT
        location
        mib-system-contact
        mib-system-name
        mib-system-location
        snmp-enabled                            enabled
        enable-snmp-auth-traps                  disabled
        enable-snmp-syslog-notify               disabled
        enable-snmp-monitor-traps               disabled
        enable-env-monitor-traps                disabled
        snmp-syslog-his-table-length            1
        snmp-syslog-level                       WARNING
        system-log-level                        WARNING
        process-log-level                       DEBUG
        process-log-ip-address                  0.0.0.0
        process-log-port                        0
        collect
                sample-interval                         5
                push-interval                           15
                boot-state                              disabled
                start-time                              now
                end-time                                never
                red-collect-state                       disabled
                red-max-trans                           1000
                red-sync-start-time                     5000
                red-sync-comp-time                      1000
                push-success-trap-state                 disabled
        comm-monitor
                state                                   disabled
                sbc-grp-id                              0
                tls-profile
```

```
                qos-enable                              enabled
        call-trace                              disabled
        internal-trace                          disabled
        log-filter                              all
        default-gateway                         192.168.17.1
        restart                                 enabled
        exceptions
        telnet-timeout                          0
        console-timeout                         0
        remote-control                          enabled
        cli-audit-trail                         enabled
        link-redundancy-state                   disabled
        source-routing                          disabled
        cli-more                                disabled
        terminal-height                         24
        debug-timeout                           0
        trap-event-lifetime                     0
        ids-syslog-facility                     -1
        options
        default-v6-gateway                      ::
        ipv6-signaling-mtu                      1500
        ipv4-signaling-mtu                      1500
        cleanup-time-of-day                     00:00
        snmp-engine-id-suffix
        snmp-agent-mode                         v1v2
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-04 15:54:29
web-server-config
        state                                   enabled
        inactivity-timeout                      5
        http-state                              enabled
        http-port                               80
        https-state                             disabled
        https-port                              443
        tls-profile
        last-modified-by                        admin@172.21.17.23
```

Enabling Remote worker (for remote workers registering into Genesys SIP server via the E-SBC)

A section of the testing also included remote endpoints that register through the E-SBC to the SIP server (Test cases 29-32). This would require the following access configuration to be configured on the E-SBC in addition to the SIP trunking config mentioned above.



We add another physical interface (M01), network interface (M01:0), a realm and a sip interface solely for registration purposes. This network interface would be a public ip in the DMZ where all the remote endpoints would be registering to.

```
local-policy
        from-address                            *
        to-address                              *
        source-realm                            access
        description
        activate-time
        deactivate-time
        state                                   enabled
        policy-priority                         none
        policy-attribute
                next-hop                                192.168.2.228
                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
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-11 14:40:37
network-interface
        name                                    M01
        sub-port-id                             0
        description
        hostname
        ip-address                              192.168.7.20
        pri-utility-addr                        192.168.7.21
        sec-utility-addr                        192.168.7.22
        netmask                                 255.255.255.0
        gateway                                 192.168.7.1
        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                             192.168.7.20
        ftp-address
        icmp-address                            192.168.7.20
```

```
        snmp-address
        telnet-address
        ssh-address
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-18 16:45:58

phy-interface
        name                                    M01
        operation-type                          Media
        port                                    1
        slot                                    0
        virtual-mac                             00:08:25:04:0d:18
        admin-state                             enabled
        auto-negotiation                        enabled
        duplex-mode                             FULL
        speed                                   100
        wancom-health-score                     50
        overload-protection                     disabled
        mac-filtering                           disabled
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-18 16:40:40
realm-config
        identifier                              access
        description
        addr-prefix                             0.0.0.0
        network-interfaces                      M01:0
        mm-in-realm                             enabled
        mm-in-network                           enabled
        mm-same-ip                              enabled
        mm-in-system                            enabled
        bw-cac-non-mm                           disabled
        msm-release                             disabled
        qos-enable                              disabled
        generate-UDP-checksum                   disabled
        max-bandwidth                           0
        fallback-bandwidth                      0
        max-priority-bandwidth                  0
        max-latency                             0
        max-jitter                              0
        max-packet-loss                         0
        observ-window-size                      0
        parent-realm
        dns-realm
```

```
        media-policy
        media-sec-policy
        srtp-msm-passthrough                    disabled
        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                  enabled
        rtcp-policy
        constraint-name
        session-recording-server
        session-recording-required              disabled
        manipulation-string
        manipulation-pattern
        stun-enable                             disabled
        stun-server-ip                          0.0.0.0
        stun-server-port                        3478
        stun-changed-ip                         0.0.0.0
        stun-changed-port                       3479
        sip-profile
        sip-isup-profile
        match-media-profiles
        qos-constraint
        block-rtcp                              disabled
        hide-egress-media-update                disabled
        tcp-media-profile
        monitoring-filters
        node-functionality
        default-location-string
        alt-family-realm
        pref-addr-type                          none
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-18 16:46:46
sip-interface
        state                                   enabled
        realm-id                                access
        description
        sip-port
                address                                 192.168.7.20
                port                                    5060
                transport-protocol                      UDP
                tls-profile
                allow-anonymous                         registered
                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                       always
        nat-interval                        30
        tcp-nat-interval                    90
        registration-caching                enabled
        min-reg-expire                      300
        registration-interval               3600
        route-to-registrar                  enabled
        secured-network                     disabled
        teluri-scheme                       disabled
        uri-fqdn-domain
        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
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-18 16:48:04
steering-pool
        ip-address                              192.168.7.20
        start-port                              40000
        end-port                                50000
        realm-id                                access
        network-interface
        last-modified-by                        admin@172.21.17.23
        last-modified-date                      2014-11-18 16:47:10
```

A basic configuration on the E-SBC to route calls to and from Genesys server environment is now complete. The following sections highlight some of the useful tips to configure the E-SBC in order to successfully resolve and overcome interoperability challenges in a SIP trunking environment between the Genesys SIP Server and Service provider network. It is outside the scope of this document to include all the interoperability working information as it will differ in every deployment.

Test Plan Executed

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

Functional Test Cases		
#	**Scenario Description**	**Supported**
1	Inbound Call to Agent released by caller	Yes
2	Inbound Call to Agent released by agent	Yes
3	Inbound Calls rejected	Yes
4	Inbound Call abandoned	Yes
5	Inbound Call to Route Point with Treatment	Yes
6	Interruptible Treatment	Yes
7	IVR (Collect Digit) Treatment	Yes
8	Inbound Call routed by using 302 out of SIP Server signaling path	Yes
9	1PCC Outbound Call from SIP Endpoint to external destination	Yes
10	3PCC Outbound Call to external destination	Yes
11	1PCC Outbound Call Abandoned	Yes
12	Caller is put on hold and retrieved by using RFC 2543 method	Yes
13	T-Lib-Initiated Hold/Retrieve Call with MOH using RFC 3264 method	Yes
14	3PCC 2 Step Transfer to internal destination by using re-INVITE method	Yes
15	3PCC Alternate from consult call to main call	Yes
16	1PCC Unattended (Blind) transfer using REFER	Yes
17	1PCC Attended Transfer to external destination	Yes
18	3PCC Two Step Conference to external party	Yes
19	3PCC (same as 1PCC) Single-Step Transfer to another agent	Yes
20	3PCC Single Step Transfer to external destination using REFER	Yes
21	3PCC Single Step Transfer to internal busy destination using REFER	Yes
22	Early Media for Inbound Call to Route Point with Treatment	Yes
23	Early Media for Inbound Call with Early Media for Routed to Agent	Yes
24	Inbound call routed outbound (Remote Agent) using INVITE without SDP	Yes
25	Call Progress Detection	Yes
26	Out of Service detection; checking MGW live status	Yes

27	SIP Authentication for outbound calls	No
28	SIP Authentication for incoming calls	No
	E-SBC-Specific Test	
29	T-Lib-Initiated Answer/Hold/Retrieve Call for Remote SIP endpoint which supports the BroadSoft SIP Extension Event Package	Yes
30	3PCC Outbound Call from Remote SIP endpoint to external destination	Yes
31	3PCC Two Step Transfer from Remote SIP endpoint to internal destination	Yes
32	1PCC Attended Transfer from Remote SIP endpoint to external destination	Yes

The summary of the test plan is as follows

Total Test Cases	Pass	Fail	Not Supported	Pending
32	30	0	2	0

The following features are supported with the E-SBC and Genesys SIP server.

Feature Name	
General Features Supported By E-SBC	**Supported**
Inbound Calls - Standard	Yes
Inbound Calls - Contact Center/Routed	Yes
Outbound Calls - Standard	Yes
Outbound Calls - Automated Dialer Campaign, CPD by Genesys	Yes
Remote Agent, not REGISTERed to SIP Server	Yes
Call Qualification & Parking	Yes
GVP - Advanced IVR (VXML, TTS, ASR, etc), Conferencing, & more	Yes
Technical Features	**Supported**
"Single Site"	Yes
"Multisite"	Yes
SIP Business Continuity	Yes
Transfer with re-INVITE	Yes
Transfer with 3xx	Yes
Transfer with REFER	Yes
Ad Hoc Conference	Yes
SIP Authentication	No
SIP Over TLS	Yes
SRTP	Yes
Service Monitoring	Yes
SIP Server High Availability - with Virtual IP Address	Yes
SIP Trunk/E-SBC/Gateway High Availability - with Virtual IP Address	Yes
SIP Trunk/E-SBC/Gateway High Availability – List of IP Addresses	N/T
SIP Server High Availability - DNS-based Redundancy with SIP Proxy	N/T
SIP Trunk/E-SBC/Gateway High Availability - DNS-based Redundancy	N/T
Audio Codec Support	Yes
Video Support	N/T
E-SBC-Specific	**Supported**
Inbound & Outbound Calls	Yes
SIP Agent 3PCC Control	Yes
Remote Agent - Transfer with REFER (SIP Phone via E-SBC)	Yes
Transfer with REFER	Yes
Transfer with re-INVITE	Yes

Troubleshooting Tools

If you find that you are not able to complete calls or have problems with the test cases, there are a few tools available for the E-SBC like logging and tracing which may be of assistance. In this section we will provide a list of tools which you can use to aid in troubleshooting any issues you may encounter.

On the Oracle Enterprise Session Border Controller - Acme Packet 3820

The 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:

```
3820A-Genesys-IOT# reset sipd
3820A-Genesys-IOT# notify sipd debug
3820A-Genesys-IOT#
enabled SIP Debugging
3820A-Genesys-IOT# 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 192.168.5.24
Connected to 192.168.85.55.
220 3820A-Genesys-IOTFTP server (VxWorks 6.4) ready.
User (192.168.85.55:(none)): user
331 Password required for user.
Password: acme
230 User user logged in.
ftp> cd /ramdrv/logs
250 CWD command successful.
ftp> get sipmsg.log
200 PORT command successful.
150 Opening ASCII mode data connection for '/ramdrv/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 '/ramdrv/logs/log.sipd' (204681
bytes).
226 Transfer complete.
ftp: 206823 bytes received in 0.11Seconds 1897.46Kbytes/sec.
ftp> bye
221 Goodbye.
```

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

Telnet

Since we are working within an architecture which uses bound TCP listening ports for functionality, the simplest form of troubleshooting can be seeing if the devices are listening on a particular port, as well as confirming that the there is nothing blocking them such as firewalls. Ensure that you have a TELNET client available on a workstation

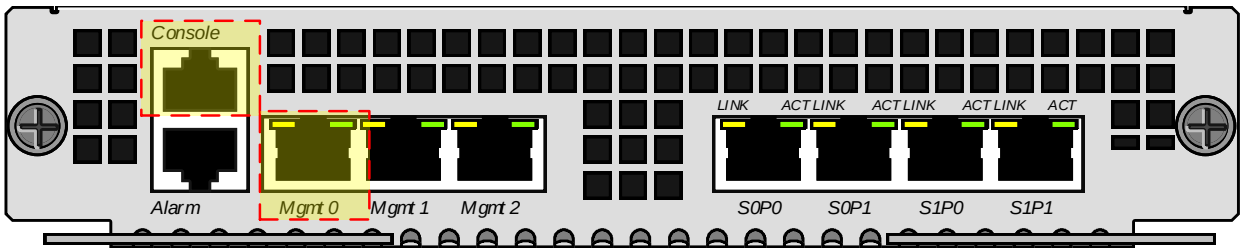
Appendix A

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.

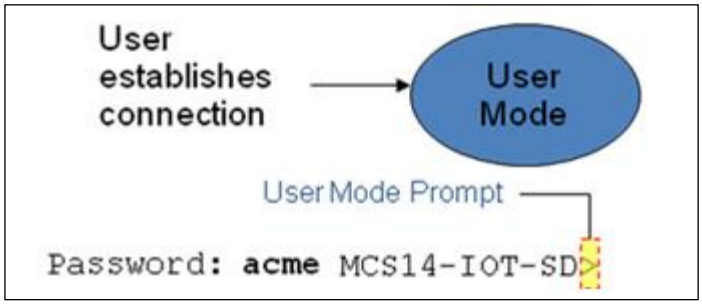


ACLI Basics

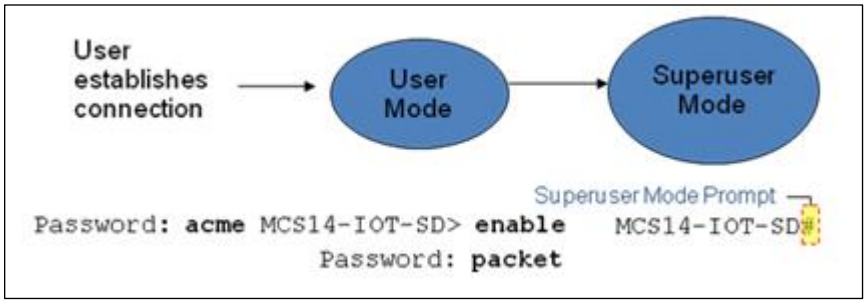
There are two password protected modes of operation within the ACLI, User mode and Superuser mode.

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.



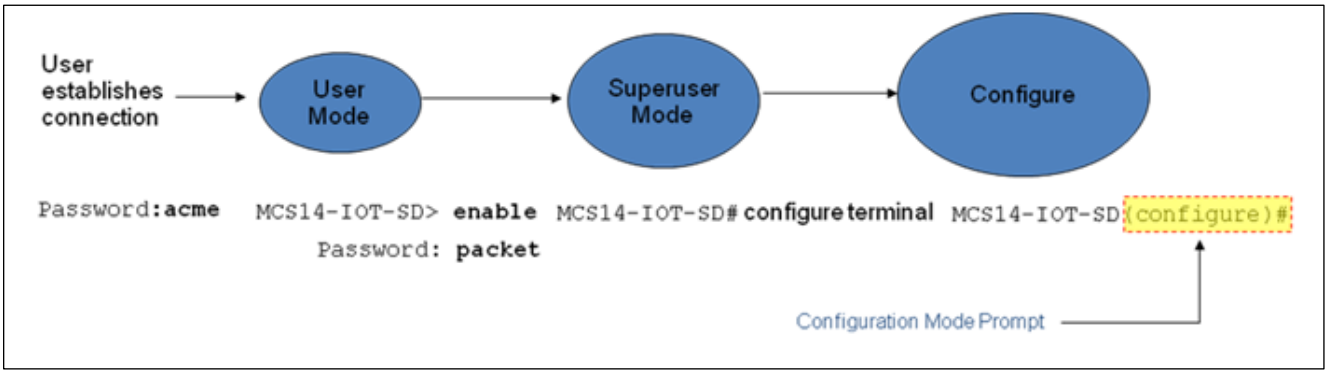
The Superuser mode allows for access to all system commands for operation, maintenance, and administration. This mode is identified by the pound sign (#) in the prompt after the target name. To enter the Superuser mode, issue the enable command in the User mode.



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.

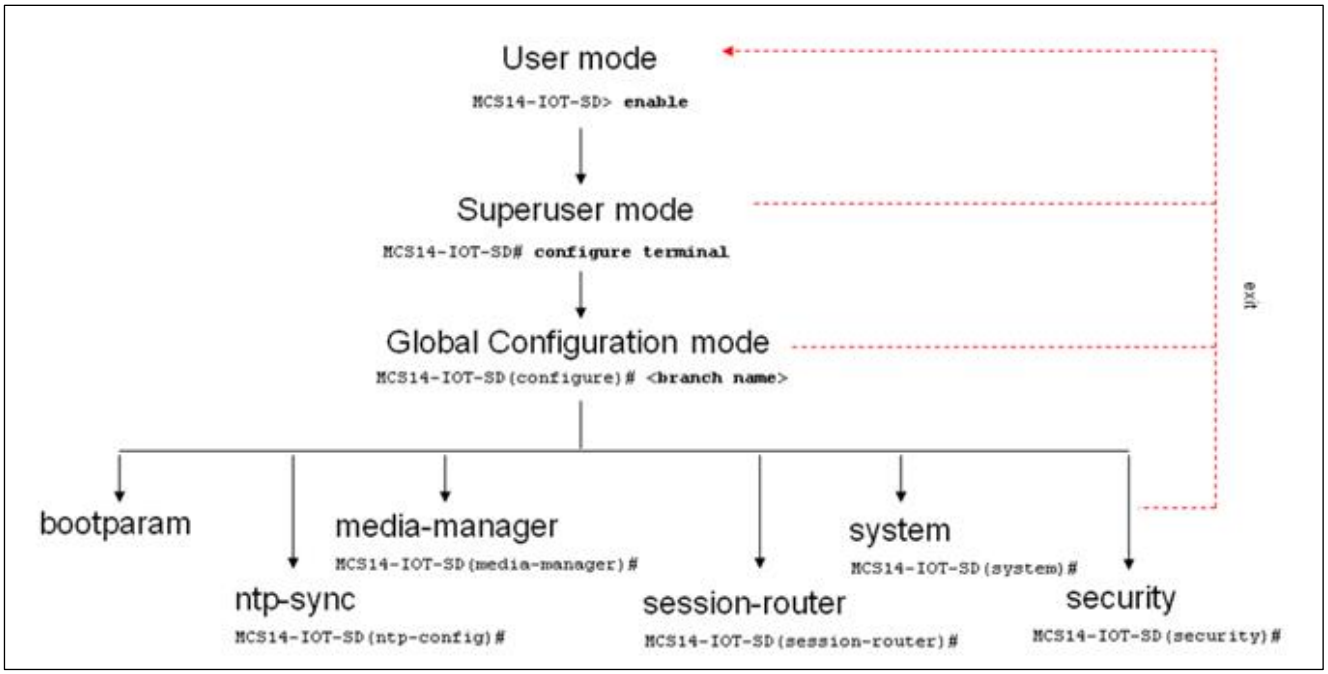
You must enter the Configuration mode to configure elements. For example, you can access the configuration branches and configuration elements for signaling and media configurations. To enter the Configuration mode, issue the **`configure terminal`** command in the Superuser mode.

Configuration mode is identified by the word configure in parenthesis followed by the pound sign (#) in the prompt after the target name, for example, **3820A-Genesys-IOT(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.

```
3820A-Genesys-IOT # 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'.
3820A-Genesys-IOT #
```

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.

```
3820A-Genesys-IOT# activate-config
Activate-Config received, processing.
waiting 120000 for request to finish
Request to 'ACTIVATE-CONFIG' has Finished,
Activate Complete
3820A-Genesys-IOT#
```