Aastra Clearspan

Configuration Guide
For Use with AT&T's

IP Flexible Reach Service

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1 Introduction

The purpose of this document is to describe the steps required to configure the components in a Clearspan IP-PBX for successful integration with AT&T IP Flexible Reach SIP trunking services.

This document describes the (IP Flex Reach specific) configuration for the Clearspan IP PBX Network Server and the Acme Packet Net-Net OS - Session Border Controller (SBC).

2 Special Notes

Clearspan (Broadworks) does not support the REFER method of performing transfers on the network side of the AS. All transfers on the network side of the AS are performed using re-INVITE. Therefore transfer of a SIP trunk call to a PSTN destination will create a 'hairpin' anchoring of the media.

AT&T IP Flexible Reach packetization time preference is 30ms, therefore any endpoint configured on the Clearspan IP PBX for use with IP Flexible Reach should be configured for 30ms ptime.

The following is an example of a codec list that specifies 30ms packetization times. Ensure that this line, or a derivative of this line appears in **Aastra** phone configuration files:

```
payload=9;ptime=30;silsupp=off,payload=0;ptime=30;silsupp=off,payload=110;ptime=30;sil
supp=off,payload=18;ptime=30;silsupp=off
```

2.1 Emergency 911/E911 Services Limitations and Restrictions

Although AT&T provides 911/E911 calling capabilities, AT&T does not warrant or represent that the equipment and software (*e.g.*, IP PBX) reviewed in this customer configuration guide will properly operate with AT&T IP Flexible Reach to complete 911/E911 calls; therefore, it is Customer's responsibility to ensure proper operation with its equipment/software vendor.

While AT&T IP Flexible Reach services support E911/911 calling capabilities under certain Calling Plans, there are circumstances when that E911/911 service may not be available, as stated in the Service Guide for AT&T IP Flexible Reach found at http://new.serviceguide.att.com. Such circumstances include, but are not limited to, relocation of the end user's CPE, use of a non-native or virtual telephone number, failure in the broadband connection, loss of electrical power, and delays that may occur in updating the Customer's location in the automatic location information database. Please review the AT&T IP Flexible Reach Service Guide in detail to understand the limitations and restrictions.

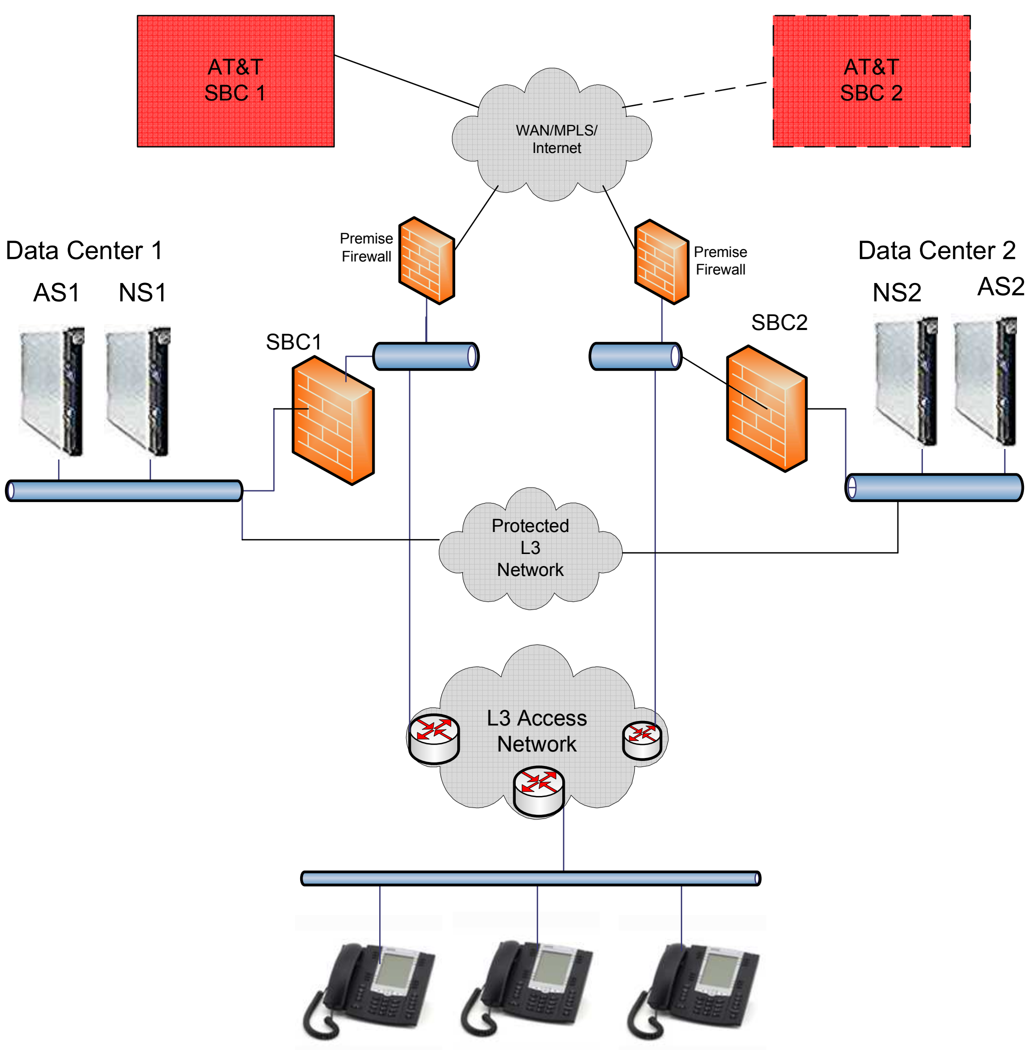
3 Overview

The Clearspan system configuration consists of the following:

- Clearspan IP PBX Release R17sp4.
- Acme Packet (SBC) Net-Net OS-E Version E3.6.0.M4P5
- Audiocodes Mediant series – FXS (used for FAX)

Provisioning changes to several Clearspan components is necessary to achieve full functionality of the AT&T IP Flexible Reach SIP trunking service. Example provisioning sequences for each of the Clearspan components is described in the following sections.

A reference drawing is provided below.



4 Configuration Guide

4.1 Clearspan Network Server Provisioning

4.1.1 Inbound (DID) Routing Configuration

- Create an inbound-only routing policy (if non-existent)

```
NS_CLI/Policy/Profile> add inbound CallTyping DefaultInst
...Done

NS_CLI/Policy/Profile> add inbound SubLocation DefaultInst
...Done

NS_CLI/Policy/Profile> add inbound UrlDialing DefaultInst
...Done

NS_CLI/Policy/Profile> get profile inbound
Profile:  inbound
                 Policy              Instance
   ==========================================
             CallTyping           DefaultInst
            SubLocation           DefaultInst
             UrlDialing           DefaultInst

NS_CLI/Policy/Profile>
```

- Create a system Routing Element to represent the AT&T SBC(s) as an inbound call source.

   Elements in the example below:

   - Routing NE name: **AT&T**
   - Routing NE location by Country Code, NPA and NXX: **1732320**
   - Route cost: **1**
   - Route weight: **50**
   - Routing profile: **inbound**
   - Polling enabled: **false**
   - Routing NE operational state: **OnLine**
   - Routing NE signaling attributes: **InboundOnly**

```
NS_CLI/System/Device/RoutingNE> add AT&T 1732320 1 50 inbound false OnLine
InboundOnly
...Done
```

- Add addresses for the AT&T SBC Routing NE(s)

  Elements in the example below:

  - Routing NE name: **AT&T**
  - Public IP address of the AT&T SBC (example only): **111.222.233.245**, **111.222.233.245**.

Note1: INVITE's from AT&T will be sent to the Clearspan SBC, which will forward them to the Network Server. The 'Via' header in the INVITE from the SBC will contain AT&T's public IP address, which will allow the Network server to identify the source of the INVITE and apply the "inbound" routing profile defined above.

  - Route cost: **1**
  - Route weight: **50**
  - Signaling port: **5060**
  - Signaling transport: **udp**

Note2: Cost, weight, port, and transport are required provisioning elements for a RoutingNE address entry but are only applicable to outbound INVITE's, so the values entered here have no significance.

```
NS_CLI/System/Device/RoutingNE/Address> add AT&T 111.222.233.245 1 50 5060 udp
...Done

NS_CLI/System/Device/RoutingNE/Address> add AT&T 111.222.233.246 1 50 5060 udp
...Done

NS_CLI/System/Device/RoutingNE/Address> get
About to access 2 entries. Continue?

Please confirm (Yes, Y, No, N): y
Retrieving data... Please wait...
    Routing NE          Address  Cost  Weight  Port  Transport
==============================================================
      AT&T  111.222.233.245     1      50  5060        udp
      AT&T  111.222.233.246     1      50  5060        udp
```

4.1.2 Outbound Routing Configuration

- Create a 'Hosting Network Element' (hostingNE) to represent the AT&T SBC(s) as an outbound routing target.

  Elements in the example below:

  - Hosting NE name: **AT&T**
  - Routing policy: **enterprise**
  - Default Enterprise (provisioning): **SomeCorp**
  - Default Routing Enterprise: **SomeCorp**
  - Default Site (provisioning): **DFLT_SITE**
  - Default Routing Site: **DFLT_SITE**
  - Country code: **1**
  - Poll enabled: **false**
  - Hosting NE operational state: **OnLine**
  - XSP version restriction: **false**
  - Session replication enabled: **false**
  - Cluster type: **primarySecondary**
  - User Capacity: **999999**
  - Hosting NE capabilities: **CallProcessingCapable**
  - Type: **other**

```
NS_CLI/System/Device/HostingNE> add AT&T enterprise SomeCorp SomeCorp DFLT_SITE
DFLT_SITE 1 false OnLine false false primarySecondary 999999
CallProcessingCapable other
...Done
```

- All signaling from the Clearspan AS to AT&T must be routed through a Clearspan SBC cluster. Node 0 is added by default when the Hosting NE is created. Add a second node to the AT&T Hosting NE. The second node will represent the second SBC cluster as an outbound gateway to the AT&T SBC's.

```
NS_CLI/System/Device/HostingNE/Node> add AT&T 1
...Done
```

- Provision the address(es) for the AT&T Hosting NE nodes. Since all signaling must traverse a Clearspan SBC, the network server must be provided with the inside-alias ip address of each Clearspan SBC, but using a unique destination port number on the SBC, so that the SBC will source-route INVITE's received on that unique port to AT&T.

  Elements in the example below:

  - HostingNe: **AT&T**
  - Node: **0** (or 1)
  - Address: **10.95.100.96** (Inside-Alias IP address for Clearspan SBC cluster 1)
  - Address type: signaling
  - Route cost: **1 (or 2)**
  - Route weight: **99**
  - Signaling port: **5071** (Clearspan SBC cluster port)
  - transport: **udp**

```
NS_CLI/System/Device/HostingNE/Address> add AT&T 0 10.95.100.96 signaling 1 99
5071 udp
...Done

NS_CLI/System/Device/HostingNE/Address> add AT&T 1 10.95.101.58 signaling 2 99
5071 udp
...Done
```

- Add the AT&T HostingNE as an Authorized host for the EnterpriseNetworkGatewayRouting policy.

  Elements in the example below:

  - Enterprise: **SomeCorp**
  - Authorized Hosting NE: **AT&T**

```
NS_CLI/SubscriberMgmt/Enterprise/Policy/EntNGWRouting/AuthHost> add SomeCorp AT&T
...Done
```

- Add the AT&T Hosting NE to the Enterprise Network Gateway routing table.

Note: For systems in production, completing this step should be delayed until after the Session Border Controller provisioning has been completed.

Elements in the example below:

- Enterprise: **SomeCorp**
- Site: **DFLT_SITE**
- Call Type: **ALL**
- Hosting NE: **AT&T**
- Route Cost: **1**
- Route Weight: **99**
- Digit Manipulation Index (DMI): **""** (Null)

```
NS_CLI/SubscriberMgmt/Enterprise/Policy/EntNGWRouting/RoutingList> add SomeCorp
DFLT_SITE ALL AT&T 1 99 ""
...Done
```

4.2 Session Border Controller Provisioning

- On each SBC cluster, create the Network Server (NS) cluster as a SIP gateway

```
config vsp
 config enterprise
  config servers
   config sip-gateway NS
    set domain <FQDN or IP(alias) of NS cluster>
    set failover-detection ping
    set ping-interval 30
    set dead-threshold 3
    config server-pool
     config server NS1
      set host <IP or FQDN of NS1>
     return
     config server NS2
      set host <IP or FQDN of NS2>
     return
     set handle-response 503 try-next-peer
    return
   return
```

- On each SBC cluster, create the AT&T domain as a SIP gateway

```
   config sip-gateway "AT&T IP Flex"
    set failover-detection ping
    set ping-interval 40
    config server-pool
     config server SBC1
      set host <AT&T assigned IP Address 1>
      set preference 1
     return
```

```
    config server SBC2
     set host <AT&T assigned IP Address 2>
     set preference 2
    return
  return
```

- On each SBC cluster, enable a unique SIP port on the inside alias IP address as a source-route trigger.

```
config cluster
 config vrrp
  config vinterface vx100
   config ip "Inside Alias"
    config sip
     set udp-port 5071 "vsp\enterprise\servers\sip-gateway AS1&AS2" "" any 0
```

- On each SBC cluster, create a session-config entry for inbound calls

```
config vsp
 config session-config-pool
  config entry "From AT&T IP Flex"
   config sip-settings
    set preserve-call-id enabled
    set handle-3xx-locally enabled
    set inleg-tos overwrite 184
    set outleg-tos overwrite 184
   return
   config to-uri-specification
    set host next-hop
    set port next-hop
   return
   config request-uri-specification
    set host next-hop
    set port next-hop
   return
   config contact-uri-settings-in-leg
    set add-maddr disabled
    set registration-plan-precedence false
   return
   config contact-uri-settings-out-leg
    set add-maddr disabled
    set registration-plan-precedence false
   return
   config media
    set anchor enabled
    set auto-conference disabled "" out
    set packet-marking tos 0xb8
    set rtcp pass true
   return
   config sip-directive
    set directive allow
   return
   config third-party-call-control
    set admin enabled
    set handle-refer-locally disabled
   return
  return
```

- On each SBC cluster, create a session-config entry for outbound calls
    - Note that this session-config provides AT&T-specific manipulations for the 'From,' 'P-Asserted-Id,' and 'Diversion' headers.

```
config vsp
 config session-config-pool
  config entry "To AT&T IP Flex"
   config sip-settings
    set preserve-call-id enabled
   return
   config to-uri-specification
    set host next-hop
    set port next-hop
   return
   config from-uri-specification
    set host local-ip
    set port local
   return
   config request-uri-specification
    set host next-hop
    set port next-hop
   return
   config p-asserted-identity-uri-specification
   return
   config contact-uri-settings-in-leg
    set add-maddr disabled
    set registration-plan-precedence false
   return
   config contact-uri-settings-out-leg
    set add-maddr disabled
    set registration-plan-precedence false
   return
   config media
    set anchor enabled
    set auto-conference disabled "" out
    set packet-marking tos 0xb8
    set rtp-stats enabled
    set rtcp pass true
   return
   config out-codec-preferences
    set preference audio g729 1
    set preference audio pcmu 2
   return
   config sip-directive
    set directive allow
   return
   config header-settings
    config reg-ex-header 1
     set destination Diversion
     set create Diversion ^(.*)@(.*)>;(.*) "\1@[Local Public IP]>;\3"
    return
   return
   config third-party-call-control
    set admin enabled
    set handle-refer-locally disabled
   return
  return
```

- On each SBC cluster create a source route for inbound calls

```
config vsp
 config dial-plan
  config source-route "From AT&T IP Flex"
   set priority 1
   set location-match-preferred no
   set peer server "vsp\enterprise\servers\sip-gateway NS"
   set session-config vsp\session-config-pool\entry "From AT&T IP Flex"
   set source-match server "vsp\enterprise\servers\sip-gateway ""AT&T IP
Flex"""
  return
```

- On each SBC cluster create a source route for outbound calls

```
config vsp
 config dial-plan
  config source-route "To AT&T IP flex"
   set description "Outbound calls to AT&T IP Flex"
   set priority 1
   set peer server "vsp\enterprise\servers\sip-gateway ""AT&T IP Flex"""
   set session-config vsp\session-config-pool\entry "To AT&T IP Flex"
   set source-match local-port 5071 < Alias IP Inside (Trusted) >
  return
```

5 Troubleshooting

For product Technical support, contact the Aastra Customer Service Center (CSC) at 1-800-729-1872.