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.
- 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:

  o Routing NE name: AT&T
  o Public IP address of the AT&T SBC (example only): 111.222.233.245, 111.222.233.246.

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

  o Route cost: 1
  o Route weight: 50
  o Signaling port: 5060
  o 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...

<table>
<thead>
<tr>
<th>Routing NE</th>
<th>Address</th>
<th>Cost</th>
<th>Weight</th>
<th>Port</th>
<th>Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT&amp;T</td>
<td>111.222.233.245</td>
<td>1</td>
<td>50</td>
<td>5060</td>
<td>udp</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>111.222.233.246</td>
<td>1</td>
<td>50</td>
<td>5060</td>
<td>udp</td>
</tr>
</tbody>
</table>
```
**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
  o 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 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\2[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

```bash
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

```bash
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.