

Avaya Solution & Interoperability Test Lab

Application Notes for Configuring the Quintum Tenor AS or Tenor AX with Avaya Communication Manager and Avaya SIP Enablement Services - Issue 1.0

Abstract

These Application Notes describe the steps for configuring the Quintum Tenor AS or Tenor AX VoIP Multipath Switch with Avaya Communication Manager and Avaya SIP Enablement Services. The Quintum Tenor AS or AX VoIP Multipath Switch provides analog telephone access with VoIP capability and multipath switching for redundancy. Emphasis of the testing was placed on verifying Tenor AS or AX interoperability with Avaya SIP Enablement Services. Please note that beginning with release 3.0, the Avaya Converged Communication Server (CCS) has been renamed to Avaya SIP Enablement Services (SES). Information in these Application Notes has been obtained through Developer*Connection* compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

Avaya Communication Manager and Avaya SIP Enablement Services have the capability to extend advanced telephony features to SIP stations. This feature set can be extended to analog telephones through the use of the Quintum Tenor AS or AX VoIP Multipath Switch.

These Application Notes describe a solution for configuring the Quintum Tenor AS or AX VoIP Multipath Switch to interoperate with Avaya Communication Manager and Avaya SIP Enablement Services (SES). The Tenor AS or AX is a multipath switch capable of supporting analog telephones. The Tenor AS or AX registers with Avaya SES on behalf of the analog telephones that are connected to it, using SIP signaling. When a call is place from an analog telephone, the Tenor AS or AX will send control messages to SES to set up the call. Once the call has been set up, the Tenor AS or AX digitizes the analog signals from the analog telephone using the agreed upon codec established during call setup and sends the digitized signals out in RTP packets over the data network. In addition, the Tenor AS or AX was configured to route call to the Main Site through the PSTN should the data network become unavailable.

Quality of Service was achieved through the use of Layer-3 (DiffServ) parameter configuration on the Tenor AS or AX VoIP Multipath Switch.

1.1. Configuration

Figure 1 illustrates the configuration used in these Application Notes. All Avaya SIP telephones and analog telephones are registered to Avaya Communication Manager via Avaya SIP Enablement Services (SES) and are administered as Off-PBX-Telephones stations in Avaya Communication Manager. All Avaya H.323 IP telephones are registered to Avaya Communication Manager. The two DID numbers of the ISDN-PRI trunk to the Main Site are each mapped to a telephone extension at the Main Site. The DID number of the POTS line is mapped to extension 40003 at the Branch Site.



Figure 1: Sample Network Configuration

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2. Equipment and Software Validated

The following equipment and software/firmware were used for the sample configuration provided:

| Equipment | Software/Firmware |
|--------------------------------------------|---------------------------------|
| Avaya S8300 Media Server with Avaya G350 | Avaya Communication Manager 3.1 |
| Media Gateway | (R03.1-01.0.628.6) |
| | Service Pack |
| | 01.0.628-11410 |
| Avaya SIP Enablement Services (SES) Server | 3.1 (build 18) |
| Avaya 4620 SIP Telephones | 2.2.2 |
| Avaya 4620 H.323 Telephones | 2.3 |
| Quintum Tenor AS VoIP Multipath Switch | P104-10-00 |
| Quintum Tenor AX VoIP Multipath Switch | P104-10-00 |

3. Avaya Communication Manager

This section highlights the commands for configuring Avaya Communication Manager. For complete documentation on administering Avaya Communication Manager, see references [1] and [2]. Use the System Access Terminal (SAT) interface to perform these steps. Log in using appropriate credentials.

| Step | Description | | | | | | | | | | |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|
| 1. | Use the display system-parameters customer-options command to verify that | | | | | | | | | | |
| | Maximum Off-PBX Telephones – OPS has been set to a value that will accommodate | | | | | | | | | | |
| | the number of SIP telephones to be supported | | | | | | | | | | |
| | the number of Sh' telephones to be supported. | | | | | | | | | | |
| | dignless such as a such and such as a such asuch as a such as a such as a such as a su | | | | | | | | | | |
| | display system-parameters customer-options Page 1 of 10 | | | | | | | | | | |
| | G3 Version: V13 | | | | | | | | | | |
| | Location: 1 | | | | | | | | | | |
| | Platform: 13 | | | | | | | | | | |
| | Location: 1 RFA System ID (SID): 1 | | | | | | | | | | |
| | Platform:13RFA Module ID (MID):1 | | | | | | | | | | |
| | USED | | | | | | | | | | |
| | Platform Maximum Ports: 900 48 | | | | | | | | | | |
| | Maximum VMORLE Stations: 40 20 | | | | | | | | | | |
| | Maximum Off-PBX Telephones - EC500: 50 0 | | | | | | | | | | |
| | Maximum Off-PBX Telephones - OPS: 50 10 | | | | | | | | | | |
| | Maximum Off-PBX Telephones - SCCAN: 0 0 | | | | | | | | | | |
| | (NOTE: You must logoff & login to effect the permission changes.) | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

3.1. Coverage Paths for Branch Site Subscriber Extensions

The following screens illustrate the configuration for remote coverage path 1, which will be assigned to a Branch Site station that can be reached via Direct Inward Dialing (DID). That is, the user can be reached directly via a PSTN number. In the sample configuration, when a call is placed from the Main Site to station 40003 (located at the Branch Site) during a data network outage, the call will be routed to coverage path 2, which points to remote coverage 1 (917324501001).

In addition, coverage path 1 for voice mail was configured for extension 40002. Please see reference [4] for information on configuring the IA770 Intuity Audix Messaging Application.

| Step | Description | | | | | | | |
|------|------------------------------------------------------------------------------------------|--------------------------------------|---------------------|-----------------------------------|--|--|--|--|
| 1. | Use the change coverage remote command to enter the DID number of the Branch Site | | | | | | | |
| | station. | - | | | | | | |
| | | | | | | | | |
| | change coverage remo | te 1 | | Page 1 of 23 | | | | |
| | | REMOTE CALL COVERA ENTRIES FROM 1 | GE TABLE TO 1000 | | | | | |
| | 01: 917324501001 | 16: | | 31: | | | | |
| | 02: | 17: | | 32: | | | | |
| | 03: | 18: | | 33: | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 2. | Use the change cove | rage path command | to designat | e the above-defined remote | | | | |
| | coverage r1 in the P | oint1 entry enable c | alls to be ro | uted to remote coverage 1 defined | | | | |
| | above when coverage | noth 2 is invoked | | ated to remote coverage r defined | | | | |
| | above when coverage | paul 2 is invokeu. | | | | | | |
| | change coverage path | 2 | | | | | | |
| | change coverage pach | COVERAGE | DATH | | | | | |
| | C | overage Path Number: | 2 | | | | | |
| | | Next Path Number: | | nt after Coverage? n nkage | | | | |
| | COVERAGE CRITERIA | | | | | | | |
| | Station/Group St | atus Inside Call | Outside | Call | | | | |
| | Active? | n | n | | | | | |
| | Don't Answer? | y v | y v | Number of Rings: 2 | | | | |
| | All? | n | n | | | | | |
| | DND/SAC/Goto Cover? | У | У | | | | | |
| | Holiday Coverage? | n | n | | | | | |
| | COVERAGE POINTS | arage Dtg with Bridg | red Appearan | ces2 n | | | | |
| | | cruge res. with bildy | cu Appearall | CCD. II | | | | |
| | Point1: r1 | Rng: Point2: | Rng: | Point3: | | | | |
| | Point4: | Point5: | | Point6: | | | | |
| | | | | | | | | |
| | | | | | | | | |

| Step | | Desc | ription | |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 3. | Coverage path 1 was conf | igured for voice n | nail. Use | the change coverage path |
| | command to point coverage | | | |
| | _ | | _ | |
| | change coverage path 1 | | | |
| | | COVERAGE I | PATH | |
| | Covera | ge Path Number: 1 | | |
| | Ne | ext Path Number: | Hur Lir | nt after Coverage? n nkage |
| | COVERAGE CRITERIA | | | |
| | Obebien (Geneve Obebue | Tradda Gall | Outride | 2-11 |
| | Active? | n n | n n | Call |
| | Busy? | У | У | |
| | Don't Answer? | У | У | Number of Rings: 2 |
| | All? | n | n | |
| | Holiday Coverage? | y n | y n | |
| l | | | | |
| I | COVERAGE POINTS Terminate to Coverage | Pts. with Bridged | l Appearanc | ces? n |
| | Point1: h1 Rng: | Point 2: | Rng: | Point3: |
| | Point4: | Point5: | iuigi | Point6: |
| | | | | |
| | | | | |
| 4. | Hunt-group 1 is configure | d with eight audix | x extension | ns 49001-49008 in the sample |
| | configuration | 0 | | |
| | configuration. | | | |
| | | | | |
| | change hunt-group 1 | | TD | Page 1 of 60 |
| | | HONI GROC |) <u>F</u> | |
| | Group Number: | 1 | | ACD? n |
| | Group Name | IA770 | | Queue? y |
| | Group Extension: | 49000 | G | Vector? n |
| | Group Type | uca-mia | Cove Soruido De | erage Path: |
| | COR | 1 NIGIL | MM Fai | rly Answer? n |
| | Security Code | - Loc | al Agent I | Preference? n |
| | ISDN/SIP Caller Display: | 200 | ,ar ngono i | |
| | Queue Limit | | | |
| | | 110 1 m 1 t o d | | |
| | Queue Limit | unlimited Port: | | |
| | Calls Warning Threshold: Time Warning Threshold: | unlimited Port: Port: | | |
| | Calls Warning Threshold: Time Warning Threshold: change hunt-group 1 | unlimited Port: Port: | | Page 3 of 60 |
| | Calls Warning Threshold: Time Warning Threshold: change hunt-group 1 | unlimited Port: Port: HUNT GROU | ΤΡ | Page 3 of 60 |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 | unlimited Port: Port: HUNT GROU Group Exter | JP 1sion: 4900 | Page 3 of 60 Group Type: ucd-mia |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 | unlimited Port: Port: HUNT GROU Group Exter - 1500 Admi | JP 1sion: 4900 .nistered N Total Adm | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS | unlimited Port: Port: HUNT GROU Group Exter - 1500 Admi | JP 1sion: 4900 inistered M Total Adm: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 c | unlimited Port: Port: HUNT GROU Group Exter - 1500 Admi | JP 1sion: 4900 Inistered M Total Adm: Ext | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 c 1: 49001 audix 01 | unlimited Port: Port: Group Exter - 1500 Admi | JP hsion: 4900 nistered M Total Adm: Ext .4: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 | unlimited Port: Port: Group Exter - 1500 Admi | JP hsion: 4900 nistered M Total Adm: Ext .4: .5: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 03 | unlimited Port: Port: Group Exter - 1500 Admi Characters) | JP hsion: 4900 nistered M Total Adm: Ext .4: .5: .6: 7: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 c 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 04 5: 49005 audix 04 | unlimited Port: Port: Group Exter - 1500 Admi Characters) | JP nsion: 4900 nistered N Total Adm: Ext L4: .5: .6: .7: 8 | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 03 4: 49004 audix 04 5: 49005 audix 05 6: 49006 audix 06 | unlimited Port: Port: Group Exter - 1500 Admi Characters) | JP nsion: 4900 nistered N Total Adm: Ext L4: L5: .6: .7: .8: 9: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 03 4: 49004 audix 04 5: 49005 audix 05 6: 49006 audix 06 7: 49007 audix 07 | unlimited Port: Port: Group Exter - 1500 Admi Characters) | JP nsion: 4900 nistered N Total Adm: Ext L4: L5: L6: .7: .8: .9: 20: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 03 4: 49004 audix 04 5: 49005 audix 05 6: 49006 audix 06 7: 49007 audix 07 8: 49008 audix 08 | unlimited Port: Port: Group Exter - 1500 Admi Characters) | JP nsion: 4900 nistered N Total Adm: Ext 14: 15: 16: 17: .8: .9: 20: 21: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 03 4: 49004 audix 04 5: 49005 audix 05 6: 49006 audix 06 7: 49007 audix 07 8: 49008 audix 08 9: | unlimited Port: Port: Group Exter - 1500 Admi Characters) | JP nsion: 4900 nistered N Ext L4: L5: L6: L7: .8: .9: 20: 21: 22: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: I Member Range Allowed: I GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 03 4: 49004 audix 04 5: 49005 audix 05 6: 49006 audix 06 7: 49007 audix 07 8: 49008 audix 08 9: | unlimited Port: Port: HUNT GROU Group Exter - 1500 Admi tharacters) 1 1 1 1 2 2 2 | JP nsion: 4900 nistered N Ext L4: L5: L6: L7: L8: .9: 20: 21: 22: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 03 4: 49004 audix 04 5: 49005 audix 05 6: 49006 audix 06 7: 49007 audix 07 8: 49008 audix 08 9: | unlimited Port: Port: HUNT GROU Group Exter - 1500 Admi tharacters) 1 1 1 2 2 2 2 | JP nsion: 4900 nistered N Ext L4: L5: L6: L7: L8: L9: 20: 21: 22: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 03 4: 49004 audix 04 5: 49005 audix 05 6: 49006 audix 06 7: 49007 audix 07 8: 49008 audix 08 9: | unlimited Port: Port: HUNT GROU Group Exter - 1500 Admi tharacters) 1 1 1 1 2 2 2 2 | JP nsion: 4900 nistered N Ext L4: L5: L6: L7: L8: L9: 20: 21: 22: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |
| | Calls Warning Threshold: Time Warning Threshold: Change hunt-group 1 Group Number: 1 Member Range Allowed: 1 GROUP MEMBER ASSIGNMENTS Ext Name (24 of 1: 49001 audix 01 2: 49002 audix 02 3: 49003 audix 03 4: 49004 audix 04 5: 49005 audix 05 6: 49006 audix 06 7: 49007 audix 07 8: 49008 audix 08 9: | unlimited Port: Port: HUNT GROU Group Exter - 1500 Admi tharacters) 1 1 1 2 2 2 2 | JP nsion: 4900 Total Adm: Ext L4: L5: L6: L7: L8: L9: 20: 21: 22: | Page 3 of 60 00 Group Type: ucd-mia Members (min/max): 1 /8 inistered Members: 8 Name (24 characters) |

3.2. Define Stations in Avaya Communication Manager

Assign the appropriate coverage path to the station. The sample configuration assigned the coverage path 2 defined in Section 3.1 to station 40003 and coverage path 1 to station 40002. In addition, the extensions assigned to the analog telephones connected to the Tenor AS or AX must be administered as OPS extensions, since the Tenor AS or AX will be communicating with Avaya SES on behalf of the analog stations. For additional information on Avaya SES, consult references [2] and [5].

| add station 40003 | Page 1 of 4 |
|---------------------------|---------------------------------|
| | STATION |
| Extension: 40003 | Lock Messages? n BCC: 0 |
| Type: 6408D+ | Security Code: TN: 1 |
| Port: X | Coverage Path 1: 2 COR: 1 |
| Name: SIP40003 | Coverage Path 2: COS: 1 |
| | Hunt-to Station: |
| STATION OPTIONS | |
| Loss Group: 2 | Personalized Ringing Pattern: 1 |
| Data Module? n | Message Lamp Ext: 40003 |
| Speakerphone: 2-way | Mute Button Enabled? y |
| Display Language: english | |
| | Media Complex Ext: |
| | TP SoftPhone? n |

| | | Description | | | | | |
|---|---------------------------------------------------------------------------|---------------------------------------------|--|--|--|--|--|
| | Use the add station command to create new station extension 40002. | | | | | | |
| | add station 40002 | Page 1 of 4 | | | | | |
| | | STATION Fage 1 01 4 | | | | | |
| | Extension: 40002 | Lock Messages? n BCC: 0 | | | | | |
| | Type: 6408D+ | Security Code: TN: 1 | | | | | |
| | Port: X | Coverage Path 1: 1 COR: 1 | | | | | |
| | Name: SIP40002 | Coverage Path 2: COS: 1 Hunt-to Station: | | | | | |
| | STATION OPTIONS | | | | | | |
| | Loss Group: 2 | Personalized Ringing Pattern: 1 | | | | | |
| | Data Module? n | Message Lamp Ext: 40003 | | | | | |
| l | Speakerphone: 2-way | Mute Button Enabled? y | | | | | |
| | Display Language: english | | | | | | |
| | | Media Complex Ext: | | | | | |
| | | IP SoftPhone? n | | | | | |
| | add station 40002 | Page 2 of 4 | | | | | |
| | | STATION | | | | | |
| | FEATURE OPTIONS | | | | | | |
| | LWC Reception: audix | Auto Select Any Idle Appearance? n | | | | | |
| | LWC Activation? y | Coverage Msg Retrieval? y | | | | | |
| | LWC Log External Calls? n | Auto Answer: none | | | | | |
| | CDR Privacy? n | Data Restriction? n | | | | | |
| | Ber Button Bing Control2 n | Bridged Idle Line Breference? n | | | | | |
| | Per Buccon King Control: In Bridged Call Alerting? n | Restrict Last Appearance? n | | | | | |
| | Active Station Ringing: single | Conf/Trans on Drimary Appearance: n | | | | | |
| | Active beacton kinging. Single | contylitatio on filmary appearance. If | | | | | |
| | H.320 Conversion? n | Per Station CPN - Send Calling Number? y | | | | | |
| | Service Link Mode: as-needed | | | | | | |
| | Multimedia Mode: basic | | | | | | |
| | | Display Client Redirection? n | | | | | |
| l | AUDIX Name: IA770 | Select Last Used Appearance? n | | | | | |
| | | Coverage After Forwarding? s | | | | | |
| | | Direct IP-IP Audio Connections? v | | | | | |
| | Emergency Location Ext: 40002 | IP Audio Hairpinning? y | | | | | |

| Description | | | | | | | | |
|-------------------------------------------------------------|-----------------------------------|---------------------------------|-------------------------------------|--------------------------------|---------------------------------|-------------------------|----------|---|
| Use the change off-pbx-telephone station-mapping command to | | | | | | | p Avay | a |
| Con exte | nmunicat ensions. | ient Sei | rvice (S | SES | | | | |
| cha | ange off-j | bx-telephone STATI(| e station-map | ping 40003 PBX TELEPHONI | E INTEGRATION | Page | 1 of | 2 |
| St Ex 40 40 | ation stension 0003 0002 | Application OPS OPS | n Dial Ph Prefix - 40 - 40 | one Number 003 002 | Trunk Selection 1 1 | Config Set 1 1 | guration | n |
| cha | ange off-j | p bx-telephone STATI(| e station-map DNS WITH OFF- | ping 40003 PBX TELEPHONI | E INTEGRATION | Page | 2 of | 2 |
| St Ex | ation tension 0003 | Call Limit 3 | Mapping Mode both | Calls Allowed all | Bridged Calls both | | | |

3.3. Define Trunk Group in Avaya Communication Manager

| Step | Description | | | | | |
|------|--------------------------------|--------------------------------|------------------------|--|--|--|
| 1. | The following shows the sett | his trunk group connects Avaya | | | | |
| | Communication Manager wi | th Avava SES. For addition | nal information on the | | | |
| | installation and configuration | n of Avava SES please refe | r to [2] and [5] | | | |
| | instantation and configuration | i ol Avaya SLS, please lele | 1 to [2] and [5]. | | | |
| | display trunk-group 1 | | Page 1 of 20 | | | |
| | display claim gloup i | TRUNK GROUP | rage i or zo | | | |
| | Group Number: 1 | Group Type: sip | CDR Reports: y | | | |
| | Group Name: To SES | COR: 1 | TN: 1 TAC: 101 | | | |
| | Direction: two-way | Outgoing Display? n | | | | |
| | Dial Access? n | Busy Threshold: 255 | Night Service: | | | |
| | Queue Length: 0 | | | | | |
| | Service Type: tie | Auth Code? n | | | | |
| | | | Signaling Group: 1 | | | |
| | | | Number of Members: 24 | | | |
| | IRUNK PARAMETERS | | | | | |
| | Unicode Name: y | Redirect | On OPTIM Failure: 5000 | | | |
| | SCCAN? n | Di | gital Loss Group: 18 | | | |
| | | | 5 | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Step | Description |
|------|---------------------------------------------------------------------------------------------------------------------|
| 2. | The following shows the Signaling Group associated with Trunk Group 1. |
| | |
| | display signaling-group 1 |
| | STONALING GROUP |
| | Group Number: 1 Group Type: sip Transport Method: tls |
| | |
| | |
| | |
| | |
| | Near-end Node Name:procrFar-end Node Name:CCSNear-end Listen Port:5061Far-end Listen Port:5061 |
| | Far-end Network Region: |
| | Far-end Domain. devcon.com |
| | Bypass If IP Threshold Exceeded? y |
| | DTMF over IP: rtp-payload Direct IP-IP Audio Connections? y |
| | IP Audio Hairpinning? y Session Establishment Timer(min): 120 |
| | |
| | |
| 3. | Define a Trunk Group for the ISDN-PRI connection using the add trunk-group |
| | command. |
| | |
| | add trunk-group 10 Page 1 of 21 TRUNK GROUP |
| | Group Number: 10 Group Type: isdn CDR Reports: y |
| | Group Name: From PSTN COR: 1 TN: 1 TAC: 110 |
| | Direction: two-way Outgoing Display? n Carrier Medium: PRI/BRI Dial Access? y Busy Threshold: 255 Night Service: |
| | Queue Length: 0 |
| | Far End Test Line No: |
| | TestCall BCC: 4 |
| | display trunk-group 10 Page 5 of 21 |
| | Administered Members (min/max): 1/23 |
| | GROUP MEMBER ASSIGNMENTS Total Administered Members: 23 |
| | Port Code Sfx Name Night Sig Grp |
| | 2: 001V502 MM710 10 |
| | 3: 001V503 MM710 10 4: 001V504 MM710 10 |
| | 5: 001v505 MM710 10 |
| | 6: 001V506 MM710 10 7: 001V507 MM710 10 |
| | 8: 001V508 MM710 10 |
| | 10: 001V510 MM710 10 |
| | 11: 001V511 MM710 10 12: 001V512 MM710 10 |
| | 13: 001v513 MM710 10 |
| | 14: 001V514 MM710 10 15: 001V515 MM710 10 |
| | |
| | |

| Step | Description | | | | | | | | | |
|------|---------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
| 4. | Define a Signaling Group for the ISDN-PRI Trunk Group using the add signaling- | | | | | | | | | |
| | group command. | | | | | | | | | |
| | | | | | | | | | | |
| | add signaling-group 10 Page 1 of 5 | | | | | | | | | |
| | SIGNALING GROUP | | | | | | | | | |
| | Group Number: 10 Group Type: isdn-pri | | | | | | | | | |
| | Associated Signaling? y Max number of NCA TSC: 0 | | | | | | | | | |
| | Primary D-Channel: 001V524 Max number of CA TSC: 0 | | | | | | | | | |
| | Trunk Group for NCA TSC: | | | | | | | | | |
| | Trunk Group for Channel Selection: | | | | | | | | | |
| | Supplementary Service Flococol. a | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

3.4. Define Incoming Call Handling in Avaya Communication Manager

At the Main Site, each DID number is mapped to a station extension using the **change inc-handling-trmt trunk-group** command. Trunk Group 10 is the ISDN-PRI trunk between the PSTN and Avaya Communication Manager. In the sample configuration, calls to DID 732-450-2001 will be sent to station 40001, and calls to DID 732-450-2002 will be sent to station 40012.

| tep | | | | Descri | ption | |
|-----|---------------|-----------|----------------|-----------|-------------|-------------|
| ι. | | | | | | |
| | | | | | | |
| | change inc-ca | all-handl | ing-trmt trunk | -group 10 | | Page 1 of 3 |
| | | | INCOMING CAL | L HANDLIN | G TREATMENT | |
| | Service/ | Calle | Per Call Night | | | |
| | Feature | Len | Number | | | CPN/BN Serv |
| | tie | 10 | 7324502001 | 10 | 40001 | |
| | tie | 10 | 7324502002 | 10 | 40012 | |
| | | | | | | |
| | | | | | | |
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3.5. Configure Audio Codec

In order for calls to be established successfully, during initial call setup, the two end points must agree upon a mutually supported codec.

| r | Use the change ip-codec-set command to change the appropriate codec-set. | | | | | | | | | |
|---|---------------------------------------------------------------------------------|--------------|-----------------|-----------|----------|------|------|---|--|--|
| | or A | X sunnorts | both G 711 an | d G 729 | codecs | 11 1 | | | | |
| | UT A | A supports | 00til 0.711 all | 100.727 | couces. | | | | | |
| | | | | | | | | | | |
| | cha | nge ip-codeo | c-set l | | | Page | l of | 2 | | |
| | | | IP | Codec Set | | | | | | |
| | | Codec Set: | 1 | | | | | | | |
| | | Audio | Silence | Frames | Packet | | | | | |
| | | Codec | Suppression | Per Pkt | Size(ms) | | | | | |
| | 1: | G.711MU | n | 2 | 20 | | | | | |
| | 2: | G.729AB | n | 2 | 20 | | | | | |
| | | | | | | | | | | |

3.6. IP Network Region

| Step | Description | |
|------|--------------------------------------------------------------------------------|--|
| 1. | Use the change ip-network-region command to set the Audio PHB Value. The Tenor | |
| | AS or AX will be set to use the same DiffServ value in Section 4, Step 15. | |
| | | |
| | change ip-network-region 1 Page 1 of 19 | |
| | IP NETWORK REGION | |
| | Region: 1 | |
| | Location: 1 Authoritative Domain: devcon.com | |
| | MEDIA PARAMETERS Intra-region IP-IP Direct Audio: yes | |
| | Codec Set: 1 Inter-region IP-IP Direct Audio: yes | |
| | UDP Port Min: 2048 IP Audio Hairpinning? y | |
| | UDP Port Max: 3028 | |
| | DIFFSERV/TOS PARAMETERS RTCP Reporting Enabled? y | |
| | Call Control PHB Value: 34 RTCP MONITOR SERVER PARAMETERS | |
| | Audio PHB Value: 46 Use Default Server Parameters? y | |
| | VIGEO PHE VALUE, ZO | |
| | Call Control 802 in Priority: 6 | |
| | Audio 802.1p Priority: 6 | |
| | Video 802.1p Priority: 5 AUDIO RESOURCE RESERVATION PARAMETERS | |
| | H.323 IP ENDPOINTS RSVP Enabled? n | |
| | H.323 Link Bounce Recovery? y | |
| | Idle Traffic Interval (sec): 20 | |
| | Keep-Alive Interval (sec): 5 | |
| | Keep-Alive Count: 5 | |
| | | |
| | | |
| | | |
| | | |

4. Configure the Tenor AS Multipath Switch

The following steps describe the configuration for the Tenor AS VoIP Multipath Switch to register with Avaya SIP Enablement Services (SES). Configuration for the Tenor AX is the same as the Tenor AS described below. For detail information on installing and running Tenor Configuration Manager, consult references [7] and [8].

| Step | Description |
|------|-------------------------------------------------------------------------------------------|
| 1. | Connect to the Tenor AS from the Tenor Configuration Manager. Select the Tenor AS |
| | switch and click on Connect . |
| | |
| | Address Book |
| | |
| | Welcome to Tenor Configuration Manager! Please specify/select a Tenor DX/BX/AX/AS/AF/CMS. |
| | |
| | Discover Cancel Edit |
| | Tenor IP Address Server Port Description Serial Number Software Version Login |
| | 10.1.1.40 8080 Avaya Lab AS A012-1039C6 P104-10-00 admin |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | Connect Close Export Import |
| | |
| | |

| Step | Description |
|------|-------------------------------------------------------------------------------------|
| 2. | Click on the Advanced Explorer icon on the menu bar. |
| | |
| | Tenor Configuration Manager (Connected to Tenor AS 10.1.1.40) |
| | |
| | Basic Config <mark>uration</mark> |
| | - IP Address Configuration Specify how your Tenor will obtain an IP Address |
| | Dial Plan Configuration O Obtain an IP address automatically |
| | -Phone Port Configuration |
| | -Multi Path Configuration |
| | - Line Port Configuration Static IP Address |
| | -VolP Routing Configuration -SIP Configuration IP Address: 10 . 1 . 1 . 40 |
| | Subnet Mask: 255 . 255 . 0 |
| | Default Gateway: 10 . 1 . 254 |
| | External NAT IP Address: 0 . 0 . 0 |
| | DNS Server IP Address |
| | Obtain DNB Server addresses automatically O Use manually configured DNS Servers |
| | Primary DNS Server IP Address: 12 . 127 . 16 . 67 |
| | Secondary DNS Server IP Address: 12 . 127 . 17 . 71 |
| | |
| | Confirm/OK Cancel Refresh Help |
| | ОК |
| | |

| Step | Description |
|------|-------------------------------------------------------------------------------------------------|
| 3. | From the Advanced Explorer panel on the left, click on the + sign next to System- |
| | Wide Configuration to expand the field. Under System-Wide Configuration, select |
| | DNS Hosts. Click Add to display the Add DNS Host pop-up window. |
| | |
| | Tenor Configuration Manager (Connected to Tenor A5 10.1.1.40) |
| | |
| | Advanced Explorer DNS Hosts |
| | P System-Wide Configuration ▲ |
| | - Sixier Server |
| | - Time Server devcon.com 50.1.1.50:5060 0 |
| | - IVR File Server |
| | - DNS Server |
| | - Remote Tenor Manager |
| | E 1 Radius Servers |
| | |
| | 🔁 🦈 Ethernet Configuration |
| | e 🖫 VolP Configuration |
| | |
| | - Tone Profile |
| | CAS Signaling Groups |
| | Confirm/OK Cancel Refresh Help |
| | ОК |
| | |
| 4. | Enter the Host Name and IP Address of the Avaya SES server. "devcon.com" is the |
| | sample DNS domain used in the sample configuration. Click OK to complete. |
| | Add DNE Hoch |
| | |
| | |
| | Lipst Name: devean com |
| | Host Name. |
| | IP Address: 50 1 1 50 5060 |
| | |
| | Priority: 0 |
| | |
| | |
| | |
| | OK Cancel Help |
| | |
| | |

| Step | Description |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5. | From the Advanced Explorer panel on the left, click on the + sign next to VoIP Configuration \rightarrow SIP Signaling Groups to expand the field. Select the SIP Signaling |
| | Group-I field. Under the General tab, enter the Primary SIP Server domain name. |
| | The sample configuration uses the domain name <i>aevcon.com</i> . |
| | Tenor Configuration Manager (Connected to Tenor AS 10.1.1.40) |
| | File View Action Help |
| | Advanced Explorer |
| | General MWI & Session Timer Advanced User Agent |
| | Gatekeepen/Border Element Register Expiry Time (in sec.): 3600 |
| | P SIP Signaling Groups Primary SIP Server: devcon.com Primary SIP Server Port. 5060 |
| | - SIP Signaling Group-1 Secondary SIP Server: Secondary SIP Server: 5060 |
| | - DN Channel Map |
| | - Gateway Primary Outbound Server: Primary Outbound Server: 5060 |
| | Fax Profile Secondary Outbound Server: |
| | P H |
| | e Way Codec Profiles |
| | P I P Routing Groups |
| | be∄}→ VoIP Routing |
| | train Configuration |
| | Confirm/OK Cancel Refresh Help |
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| Add User Agent pop- |
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| Step | Description | |
|------|-----------------------------------------------------------------------|--|
| 7. | In the Add User Agent pop-up window, enter the following information: | |
| | Primary User:40003< station defined in Avaya SES | |
| | Contact[1]: 40003 < station defined in Avaya SES | |
| | Click OK to continue. | |
| | Add User Agent | |
| | UA: 101 | |
| | SIP Listen Port: 5060 | |
| | Primary User: 40003 | |
| | Primary Password: 123456 | |
| | Secondary User: | |
| | Secondary Password: | |
| | MWI User Name: | |
| | MWI Password: | |
| | Contacts[1]: 40003 | |
| | Contacts[2]: | |
| | | |
| | OK Cancel Help | |
| | | |
| | | |





| Step | | | Description |
|------|---------------------------------------------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11. | In the Add DN Channel Map pop-up window, enter the following information. | | |
| | Channel: DN: User Agent: Public DN: Register DN: | 1 40003 101 checked checked | < port number on the Tenor AS to which the analog phone is connected < extension < user agent defined for 40003 in Step 7 < default < default |
| | Click OK to co sunburst icon t | ontinue. | Add DN Channel Map Slot: Span: Channel: DN: 40003 Calling Name: User Agent: 101 Version Register DN OK: Cancel Help At the DN Channel Map panel, click Confirm/OK and the set the change. |

| Step | Description | | |
|------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------|--|
| 12. | From the Advanced Explorer panel on the left, select the Gateway . Enter a | | |
| | Description and check the <i>SIP only</i> radio button for the Outgoing IP Routing field | | |
| | under the Gateway panel on th | ne right. | |
| | | | |
| | | | |
| | Click Confirm/OK , and then t | the sunburst icon on the menu bar to implement the | |
| | change. | | |
| | | | |
| | Tenor Configuration Manager (Connected to | Tenor AS 10.1.1.40) | |
| | File View Action Help | | |
| | | | |
| | Advanced Explorer | Galeway | |
| | - Time Server | | |
| | - IVR File Server | Description: Tenor AS Gateway | |
| | - DNS Server | | |
| | - DNS Hosts | Modern Bypass Retention Hours: 108 | |
| | – Remote Tenor Manager | Outgoing IP Routing: C H323 only C SIP only | |
| | □ □ □ Radius Servers | | |
| | U SysLog Servers | F Remote NAT | |
| | Ethornot Configuration | | |
| | | | |
| | Gatekeeper/Border Element | | |
| | - H323 Signaling Group | | |
| | 다 SIP Signaling Groups | | |
| | - SIP Signaling Group-1 | | |
| | SIP Signaling Group-2 | | |
| | – DN Channel Map | | |
| | - Gateway | | |
| | – Fax Profile | | |
| | End Point Address Directory | | |
| | Dice Codecs | | |
| | Codec Profiles | Confirm/OK Cancel Refresh Help | |
| | | ок | |
| | 15 | | |



| Step | Description |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14. | From the Advanced Explorer panel on the left, select the IP Routing Group-default under IP Routing Groups. In the General tab of the IP Routing Group-default panel on the right, select <i>Out-of-Band RFC 2833</i> for SIP Digit Relay from the drop-down menu. |
| | Advanced Employer |
| | Advanced Explored System-Wide Configuration VolP Configuration GatekeeperBorder Element H323 Signaling Group SIP Signaling Group SIP Signaling Group SIP Dig Naine Map Gateway Fax Profile End Polial Address Directory Fax Profiles The Routing Group-Getaul Fax Profiles Fax Profiles Fax Profiles Fax Profiles Fax Ording Group-Getaul Fax Profiles Fax Ording Group-Getaul Fax Profiles Fax Profiles Fax Ording Group-Getaul Fax Profiles Fax Profiles Fax Profiles Fax Profiles Fax Ording Group-Getaul Fax Profiles Fax Ording Group-Getaul Fax Profiles Fax Ording Group-Getaul Fax Profile (FXS)/Line (FXO) Configuration Phone (FXS)/Line (FXO) Configuration |
| | Confirm/OK Cancel Refresh Help |
| | ОК |
| | Confirm/OK Cancel Refresh Help |

| Step | Description |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15. | Click on the Advanced tab under the IP Routing Group-default panel on the right. Change the Media QOS Value to b8. This configures the DiffServ value in the RTP media stream to have a DiffServ value of b8 (same as the decimal value of 46 set in Avaya Communication Manager in Section 3.6). Click Confirm/OK, and then the sunburst icon on the menu bar to implement the change. |
| | Image: Connected to Tenor AS 10.1.1.40) File View Action Help Image: Connected Explorer |
| | Image: Second |

| Step | Description |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16. | From the Advanced Explorer panel on the left, expand Circuit Configuration → Trunk Routing Configuration → Hopoff Number Directories, and select the Hopoff Number Directory-1 field. Enter a Description for this Hopoff Number Directory-1. Click on Add to display the Add Hopoff Number pop-up window. |
| | Tener Configuration Manager (Connected to Tenor AS 10.1.1.40) |
| | Advanced Explorer Hopot Number Orestony 1 |
| | System-Wide Configuration |
| | Auto Switch Configuration Caller ID Translation Directories Inbound DNIS Translation Directories Directories Hopoff Number Directories Excertification Direc |
| | ContinuCik Cancel Refresh Help. |

| Step | Description | | | |
|------|---------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------|-----------------------|
| 17. | At the Add Hopoff Number pop-up window. Enter the following information: | | | |
| | Number Pattern: Replacement: | 40001 7324502001 Hopoff Number | < station extension at Main Site < DID number to reach the Static | on |
| | | Number Pattern: 400 Replacement: 732 | 01 4502001 | |
| | | Description: | | |
| | | TON: Unk | nown | |
| | | NPI: Unk | nown | |
| | | OK | Cancel Help | |
| | Click OK to contir | ue. | | |
| | Repeat Steps 16 an 40012 in the sample | d 17 for any other e configuration, e | extension that need to be reached. Inter the following: | For extension |
| | Number Pattern: Replacement: | 40012 7324502002 | < station extension at Main Site < DID number to reach the Static | on |
| | After completing, o | click on Confirm / | OK in the Hopoff Number Directo | ry-1 panel and |
| | CIICK on the st | indurst icon on the | e menu bar to implement the change. | |

| Step | Description | | |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 18. | From the Advanced Explorer panel on the left, expand Circuit Configuration \rightarrow Line | | |
| | Routing Configuration \rightarrow Hunt LDN Directories, and select the Hunt LDN | | |
| | Directory-pub1 field. Enter a Description for this Hunt LDN Directory-pub1 . Click | | |
| | on Add. | | |
| | | | |
| | Tenor Configuration Manager (Connected to Tenor AS 10.1.1.40) | | |
| | | | |
| | Advanced Explorer | | |
| | P System-Wide Configuration | | |
| | Ethernet Configuration Description: 40003 | | |
| | VolP Configuration Type: Public Private Prefix Country Code Area Code | | |
| | Signaling Configuration | | |
| | Add Delete Edit | | |
| | Index and the intervalues Index and the intervalues Index and the intervalues Index and the intervalues Index and the intervalues | | |
| | 40005 | | |
| | Bypass Number Directories | | |
| | Hunt LDN Directories | | |
| | Hunt LDN Director≁pub1 | | |
| | - Hunt LDN Directory-prv1 | | |
| | Line Circuit Routing Groups | | |
| | B Mar (Xdy Configuration | | |
| | | | |
| | Confirm/OK Cancel Refresh Help | | |
| | | | |
| | | | |
| 19. | In the Add Hunt LDN Number pop-up window, enter the Number Pattern for an | | |
| | extension at the Branch Site. Click OK to continue. | | |
| | | | |
| | Add Hunt LDN Number | | |
| | | | |
| | | | |
| | Number Pattern: 40003 | | |
| | Humber Lattern. 40000 | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | OK Cancel Help | | |
| | | | |
| | | | |
| | After completing, click on Confirm/OK in the Hunt LDN Directory-pub panel and | | |
| | | | |
| | click on the sunburst icon on the menu bar to implement the change. | | |
| | | | |
| | | | |

| Step | Description | | |
|------|----------------------------------------------------------------------------------------------------|--|--|
| 20. | Repeat Steps 18 and 19 for extension 40002 except this time select Hunt LDN | | |
| | Directory-pub2 from the Advanced Explorer screen panel. | | |
| | | | |
| 21. | From the Advanced Explorer panel on the left, expand Circuit Configuration \rightarrow Line | | |
| | Routing Configuration \rightarrow Line Circuit Routing Groups, and select Line Circuit | | |
| | Routing Group-phone. | | |
| | | | |
| | Click on the General tab in the Line Circuit Routing Group-phone panel on the right. | | |
| | From the SIP User Agent drop-down menu, select SIPUserAgent-101. This SIP User | | |
| | Agent name was automatically assigned by the system in Section 4, Step7. Click the | | |
| | Call Services tab. | | |
| | | | |
| | Tenor Configuration Manager (Connected to Tenor AS 10.1.1.40) | | |
| | | | |
| | Advanced Explorer Line Circuit Rouling Group-phone | | |
| | General T unk ID/Caller ID IVR Numbering Call Services Bypass/Hunt Advanced Interface | | |
| | Static Route-1 | | |
| | | | |
| | - Auto Switch Configuration | | |
| | Caller ID Translation Directories | | |
| | Infound DNIS Translation Directori | | |
| | Pass Through: Disabled Inbound Access Level: 0 | | |
| | Bypass Number Directories Pass Through ID: 99 Outbound Access Level: 0 | | |
| | 🖶 Hunt LDN Directories | | |
| | Line Circuit Routing Groups | | |
| | Line Circuit Routing Group-ph | | |
| | 🛱 🚈 Phone (FXS)/Line (FXO) Configur | | |
| | Analog Interface-phone | | |
| | DSP Configuration | | |
| | Confirm/OK Cancel Refresh Help | | |
| | Un | | |

| Step | | Description | |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--|
| 22. | In the Call Services tab in the Line Circuit Routing Group-phone panel on the right, check to enable the appropriate services to be available for the analog phone. The sample configuration has Hold , Unattended Transfer , Attended Transfer , and Call Waiting abacked. Click on the ByPass/Hunt tab to continue | | |
| | Waiting checked. Click | en the ByPass/Hunt tab to continue. | |
| Confirm/OK Ca | | Confirm/OK Cancel Refresh Help | |
| | <u> </u> | ОК | |



| Step | Description | | |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 24. | In the Advanced tab in the Line Circuit Routing Group-phone panel on the right, check the radio button for Enable Multi Path . | | |
| | Click Confirm/OK , and then the sunburst icon on the menu bar to implement the change. | | |
| | Tenor Configuration Manager (Connected to Tenor AS 10.1.1.40) | | |
| | | | |
| | Advanced Explorer Line Circuit Routing Group-phone | | |
| | System-Wide Configuration Ethernet Configuration VolP Configuration VolP Configuration Signaling Configuration Signaling Configuration Signaling Configuration Math Configuration Signaling Configuration Caller ID Translation Directories Inbound DNIS Translation Directories Hunt LDN Directories Hunt LDN Directories Hunt LDN Directories Hunt LDN Directories Phone (FXS)/Line (FXO) Configuration DSP Configuration DSP Configuration | | |
| | Confirm/OK Cancel Refresh Help | | |
| | ОК | | |
| | | | |

| Step | Description | | |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 25. | Repeat Steps 21 to 24, except this time select the following for Step 21 and 23.For Step 21Select Line Circuit Routing Group-phone2 on the left panel, and select SIPUserAgent-201 from the drop-down menuFor Step 23Select Hunt LDN Directory-pub2 and click << as shown below. | | |
| | | | |
| | Tenor Configuration Manager (Connected to Tenor AS 10.1.1.40) | | |
| | File View Action Help | | |
| | Avaited bepolver Avaited bepolver Avaited bepolver Avaited between all of the first of the fi | | |
| | Confirm/OK Cancel Refresh Help | | |
| | Click Confirm/OK , and then the sunburst icon on the menu bar to implement the change. | | |

| Step | Description | | |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 26. | From the Advanced Explorer panel on the left, expand Phone (FXS)/Line (FXO) Configuration , and select Analog Interface-phone , and then click Add . | | |
| | | | |
| | ······································ | | |
| | Tenor Configuration Manager (Connected to Tenor AS 10.1.1.40) | | |
| | | | |
| | | | |
| | Advanced Explorer | | |
| | | | |
| | Configuration Add Delete Edit | | |
| | Example Circuit Configuration | | |
| | | | |
| | Caller ID Translation Directories | | |
| | Discrete Provide the second se | | |
| | PUD Trunk Routing Configuration | | |
| | Broass Number Directories | | |
| | B Hunt LDN Directories | | |
| | Line Circuit Routing Groups Associated Signaling Group: | | |
| | Check (CXC)/Line (CXC) Configurati Associated Routing Group: | | |
| | Analog interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace-interace- | | |
| | E Inser DSP Configuration | | |
| | | | |
| | | | |
| | Confirm/OK Cancel Refresh Help | | |
| | | | |
| | | | |
| 27. | Enter a description for the Channel Group and click OK to continue. | | |
| | | | |
| | Specify a Unique Name | | |
| | | | |
| | | | |
| | Channel Group - phone | | |
| | | | |
| | | | |
| | OK Council | | |
| | | | |
| | | | |
| | | | |

| Step | Description | | |
|------|---------------------------------------------------------------------------|--|--|
| 28. | In the Add Channel Group-Channel Group phone pop-up window, configure the | | |
| | following information. | | |
| | Associated Signaling Group: CAS Signaling Group-phone | | |
| | Associated Routing Group: Line Circuit Routing Group-phone | | |
| | FXS Channel Assignment: check the radio button for 1 | | |
| | Click OK to complete | | |
| | Chek OK to complete. | | |
| | Add Channel Group-Channel Group phone | | |
| | | | |
| | Selected Analog Interface: Analog Interface-phone | | |
| | | | |
| | Associated Signaling Group CAS Signaling Group-phone | | |
| | Associated Routing Group: Line Circuit Routing Group-phone | | |
| | | | |
| | EVO Channel Assignment | | |
| | | | |
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| | | | |
| | | | |
| | Select All De-select All Reset | | |
| | Select All Available De-select All Available | | |
| | | | |
| | | | |
| | OK Cancel Help | | |
| | | | |
| | | | |
| | | | |

| Step | Description | | |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 29. | Repeat Steps 26-28, and enter the following information. | | |
| | Enter a description for the Channel Group and click OK . | | |
| | Specify a Unique Name | | |
| | Channel Group - phone2 | | |
| | OK Cancel | | |
| | In the Add Channel Group-phone pop-up window, select the following fields: | | |
| | Associated Signaling Group:CAS Signaling Group-phoneAssociated Routing Group:Line Circuit Routing Group-phone2FXS Channel Assignmentcheck radio button for 2 | | |
| | Click OK to complete. | | |
| | Add Channel Group-Channel Group phone2 | | |
| | | | |
| | Selected Analog Interface: Analog Interface-phone | | |
| | Associated Signaling Group CAS Signaling Group-phone | | |
| | | | |
| | Associated Rodung Group. Line Circuit Rodung Group-phone2 | | |
| | EVS Channel Assignment | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | Select All Descelect All Report | | |
| | Select All Available De-select All Available | | |
| | | | |
| | OK Cancel Help | | |
| | | | |

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| Step | Description | | |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--|
| 31. | In the Edit Channel Group-li | In the Edit Channel Group-line pop-up window, configure the following information. | |
| | Associated SignalingCAGroup:Associated RoutingTruGroup:Group:GroupFXO Channel1AssignmentFactorial | S Signaling Group-line unk Circuit Routing pup-line The port where the POTS line is connected. | |
| | Edit Channel Group-line | X | |
| | Selected Analog In Associated Signali Associated Routing | terface: Analog Interface-line ng Group CAS Signaling Group-line g Group: Trunk Circuit Routing Group-line | |
| | | FXO Channel Assignment | |
| | Select | All Available De-select All Available | |
| | | OK Cancel Help | |
| | Click OK to continue. In the Analog Interface-line panel, click Confirm/OK , and then the sunburst icon on the menu bar to implement the change. | | |

5. Interoperability Compliance Testing

The interoperability compliance testing focused on assessing the ability of the Quintum Tenor AS or AX to register with Avaya SIP Enablement Services and interoperate with Avaya SIP and Avaya H.323 telephones, and to provide the capability of rerouting calls (Multipath Switching) through the PSTN during data network outages.

5.1. General Test Approach

The general test approach was to place and receive calls through the analog telephones connected to the Tenor AS or Tenor AX at the Branch Site to and from Avaya SIP and Avaya H.323 IP telephones.

The main objectives were to verify that:

- The Tenor AS and Tenor AX can successfully register with Avaya SIP Enablement Services.
- Calls can be placed and received successfully through the Tenor AS and Tenor AX.
- Analog telephones connected through the Tenor AS and Tenor AX can successfully access features available from Avaya Communication Manager. These features include Transfer, Hold, Voice Mail, Message Waiting Indicator, and Off-PBX-Station Features Name Extensions such as call forwarding, forward to voice mail, and whisper page.
- DTMF is supported.
- Call can be placed and received successfully during data network outages.
- G.711 and G.729 codecs are supported.
- Shuffled and non-shuffled calls are successfully completed.
- QoS (Layer-3, DiffServ) is supported.

5.2. Test Results

The Quintum Tenor AS and Tenor AX successfully achieved all main objectives. Calls from analog telephones successfully interoperated with Avaya SIP and Avaya H.323 telephones in the sample network. Through the use of the on/off hook button and/or the numeric keypad buttons, the analog telephone was able to support features such as Transfer, Hold, and Off-PBX-Station Features Name Extension such as call forwarding, forward to voice mail, and whisper page offered by Avaya Communication Manager. DTMF was successfully verified through access to the voice mail system. Layer-3 QoS information was confirmed via the use of a network analyzer. In simulated data network outage, calls to the Main Site were successfully routed through the PSTN as configured in the Tenor AS and Tenor AX. Local calling among analog telephones during a data network outage is not supported in the release tested.

6. Verification Steps

The following steps may be used to verify the configuration:

- Place calls call from the analog telephones.
- Log in to the Avaya SIP Enablement Service server via a web browser. Verify that the analog stations extensions are registered with SES.

7. Support

For technical support on the Quintum Tenor AS and Tenor AX, contact Quintum at:

- (toll-free) 1.877.435.7553 from within the United States,
- +1.732.460.9399 from outside the United States
- <u>www.quintum.com</u>

8. Conclusion

These Application Notes have described the administration steps required to configure the Quintum Tenor AS or AX VoIP Multipath Switch to interoperate with Avaya SIP Enablement Services and Avaya Communication Manager in supporting analog telephones and enabling the multipath switching capability of the Tenor AS or Tenor AX.

9. Additional References

- [1] Administrator Guide for Avaya Communication Manager, Doc # 03-300509, Issue 2, February 2006
- [2] Avaya Communication Manager Advanced Administration Quick Reference, Doc # 03-300364, Issue 2, June 2005 Release 3.0
- [3] *Expanded Meet-me Conference (EMMC) version 1.0 Installation and Troubleshooting Guide for the S8500*, Doc # 04-300527, Issue 1, June 2005
- [4] Avaya IA 770 INTUITY AUDIX Messaging Application, Doc # 11-300532, May 2005
- [5] Installing and Administering SIP Enablement Services R3.1, Doc# 03-600768, Issue 1.5, February 2006
- [6] Avaya Extension to Cellular and Off-PBX Station (OPS) Installation and Administration Guide Release 3.0, version 6.0, Doc # 210-100-500, Issue 9, June 2005
- [7] Tenor AS VoIP Multipath/Gateway Switch Product Guide, P/N 480-0059-00-13
- [8] Tenor Configuration Manager/Tenor Monitor Product Guide. P/N 480-0028

Product documentation for Avaya products may be found at http://support.avaya.com.

Product documentation for Quintum Tenor AS or Tenor AX VoIP Multipath Switch products may be found at <u>http://www.quintum.com/support/products/2G/tenor_2G/index.shtml</u>.

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