Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Avaya Communication Server 1000E R7.5, Avaya Aura® Session Manager R6.2, Avaya Session Border Controller for Enterprise R4.0.5 to support Vodafone UK FMC Trunk Service – Issue 1.0

Abstract

These Application Notes describes the steps to configure Session Initiation Protocol (SIP) Trunking between Vodafone FMC Trunk service and an Avaya SIP enabled Enterprise solution. The Avaya solution consists of Avaya Aura® Session Manager, Avaya Session Border Controller for Enterprise and Avaya Communication Server 1000E.

Vodafone UK is a member of the DevConnect SIP Service Provider program. Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the steps used to configure Session Initiation Protocol (SIP) trunking between Vodafone FMC Trunk service and an Avaya SIP-enabled enterprise solution. The Avaya solution consists of Avaya Session Border Controller for Enterprise (Avaya SBCE), Avaya Aura® Session Manager and Avaya Communication Server 1000E (CS1000E). The Vodafone FMC Trunk is a fixed and mobile voice connectivity solution. Customers using this can enjoy the benefits of integration of the mobile network with an Avaya SIP-enabled enterprise solution. This allows the user to place PSTN calls as well as the ability to place and receive calls directly to mobile devices on the Vodafone network via a dedicated Internet connection and the SIP protocol. This converged network solution is an alternative to traditional PSTN trunks and generally results in lower cost for the enterprise customer.

2. General Test Approach and Test Results

The general test approach was to configure a simulated enterprise site using an Avaya SIP telephony solution consisting of CS1000E, Session Manager and Avaya SBCE. The enterprise site was configured to use the FMC Trunk service provided by Vodafone. This configuration (shown in **Figure 1**) was used to exercise the features and functionality listed in **Section 2.1.**

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Interoperability Compliance Testing

The interoperability test included the following:

- Incoming calls to the enterprise site from mobile phones using the FMC Trunk provided by Vodafone, calls made to Unistim, SIP, Digital and Analog telephones at the enterprise
- Incoming calls to the enterprise site from the PSTN routed to the DDI numbers assigned by Vodafone
- Outgoing fixed and mobile calls from the enterprise site completed via Vodafone to PSTN and mobile destinations, were made from Unistim, SIP, Digital and Analog telephones
- Calls using the G.711A and G.729 codec's supported by Vodafone
- DTMF transmission using RFC 2833 with successful Voice Mail/Vector navigation for inbound and outbound calls
- User features such as hold and resume, transfer, conference, call forwarding, etc
- Caller ID Presentation and Caller ID Restriction
- Call coverage and call forwarding for endpoints at the enterprise site
- Mobile-X call features
- Off-net call forwarding and mobility (extension to mobile)

2.2. Test Results

Interoperability testing of the sample configuration was completed with successful results for the Vodafone FMC Trunk service with the following observations:

- The CS1000E default configuration will not allow a blind transfer to be executed if the parties involved do not support the SIP UPDATE method. With the installation of plugin 501 on the CS1000E, the blind transfer will be allowed and the call will be completed. The limitation of this plugin is that no ringback is provided to the originator of the call for the duration that the destination set is ringing. In addition to plugin 501, it is required that **VTRK SU version "cs1000-vtrk-7.50.17.16-15.i386.000.ntl"** or higher be used on all SSG signaling servers to ensure proper operation of the blind transfer feature. The use of plugin 501 does not restrict the use of the SIP UPDATE method of blind transfer to other parties that do happen to support the UPATE method, but rather extend support to those parties that do not.
- When calls are placed on-hold on both inbound and outbound, Vodafone FMC Trunk service requires a RTP stream to be sent in both directions.If no RTP stream is received by Vodafone FMC Trunk, after 2 minutes a BYE is sent from the Vodafone FMC Trunk service and the call is dropped. During testing, music on-hold was configured to ensure RTP was sent in both directions during the call-hold scenario and the call-hold test-cases passed successfully.
- T.38 Fax is not supported by Vodafone UK FMC Trunk service.
- All unwanted MIME was stripped on outbound calls using the Adaptation Module in Session Manager.
- No inbound toll free numbers were tested as none were available from the Service Provider.
- No Emergency Services numbers tested as test calls to these numbers should be pre-arranged with the Operator.

2.3. Support

For technical support on the Avaya products described in these Application Notes visit http://support.avaya.com.

For technical support on Vodafone products please visit the website at http://www.vodafone.co.uk/business/business-solutions/unified-communications/index.htm or contact an authorized Vodafone representative.

3. Reference Configuration

Figure 1 illustrates the test configuration. The test configuration shows an enterprise site connected to the Vodafone FMC Trunk service. Located at the enterprise site are Session Manager, Avaya SBCE and CS1000E. Endpoints are Avaya 1140 series IP telephones, Avaya 1200 series (not shown in **Figure 1**) IP telephones (with Unistim and SIP firmware), Avaya IP Softphones (2050 and Avaya one-X® Communicator), Avaya Digital telephone, Analog telephone and fax machine. For security purposes, any public IP addresses or PSTN routable phone numbers used in the compliance test are not shown in these Application Notes.

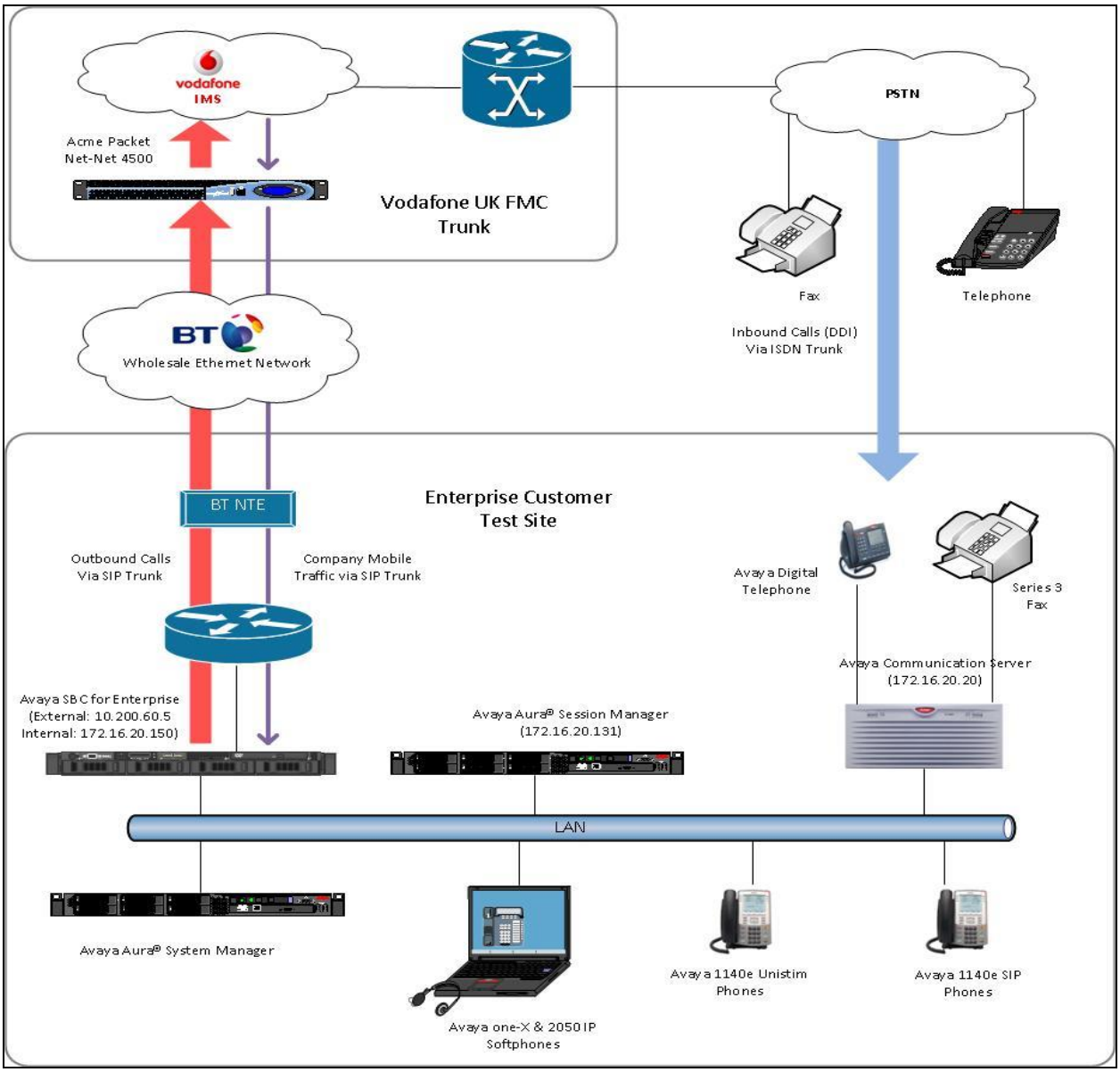


Figure 1: Test Setup Vodafone FMC Trunk to Avaya Enterprise

4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya Aura® Session Manager running on Avaya S8800 server	R6.2 Build: 6.2.3.0.623006
Avaya Aura® System Manager running on Avaya S8800 server	R6.2 Load: 6.2.0.0.15669 Service Pack 4
Avaya Communication Server 1000E	R7.5, Version 7.50.17 Service Update: 7.50_16May12 Deplist: X21 07.50Q
Avaya Communication Server 1000E Media Gateway	CSP Version: MGCC CD03 MSP Version: MGCM AB01 APP Version: MGCA BA15 FPGA Version: MGCF AA19 BOOT Version: MGCB BA15 DSP1 Version: DSP1 AB06
Avaya Session Border Controller for Enterprise on Dell R210 V2 server	Build: 4.0.5.Q09
Avaya 1140e and 1220 Unistim Telephones	FW: 0625C8A & 062AC8A
Avaya 1140e and 1220 SIP Telephones	FW: 02.02.21.00.bin
Avaya 2050PC Softphone	4.3
Avaya one-X® Communicator	Version cs6.1.0.10-GA-26321
Avaya Analogue Telephone	N/A
Avaya M3904 Digital Telephone	N/A
Vodafone	
SBC ACME Net-Net 4500	6.1
CelFocus IP Trunking AS	R11.2
Lucent SIPTRANS UA	V2.2

5. Configure Avaya Communication Server 1000E

This section describes the steps required to configure CS1000E for SIP Trunking and also the necessary configuration for telephones (analog, SIP and IP phones). SIP trunks are established between CS1000E and Session Manager. These SIP trunks will carry SIP signalling associated with the Vodafone SIP Trunk service. For incoming calls, Session Manager receives SIP messages from the Avaya SBCE and directs the incoming SIP messages to the CS1000E. Once the message arrives at the CS1000E, further incoming call treatment, such as incoming digit translations and class of service restrictions may be performed. All outgoing calls to the PSTN are processed within the CS1000E and may be first subject to outbound features such as route selection, digit manipulation and class of service restrictions. Once the CS1000E selects a SIP trunk, the SIP signalling is routed to Session Manager. Session Manager directs the outbound SIP messages to the Avaya SBCE at the enterprise site that then sends the SIP messages to Vodafone SIP Trunk service. Specific CS1000E configuration was performed using Element

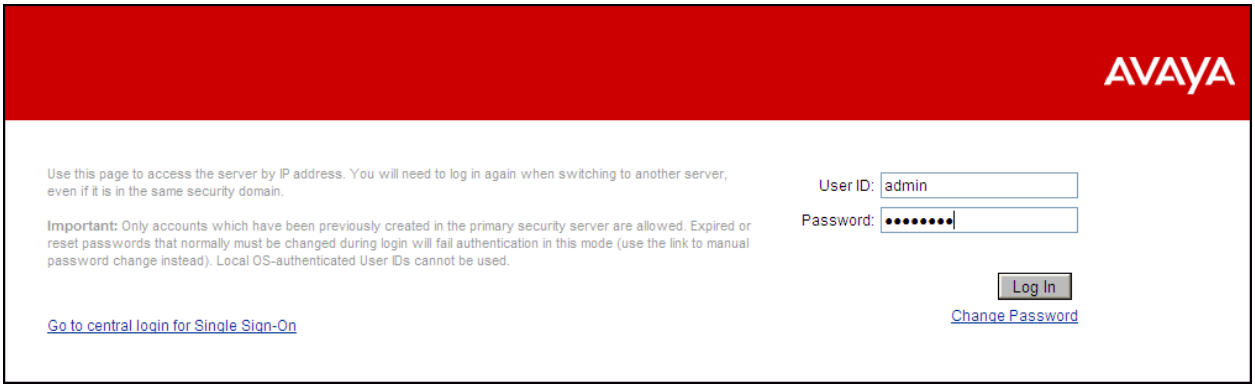
Manager and the system terminal interface. The general installation of the CS1000E, System Manager and Session Manager is presumed to have been previously completed and is not discussed here.

5.1. Log in to the Avaya Communication Server 1000E

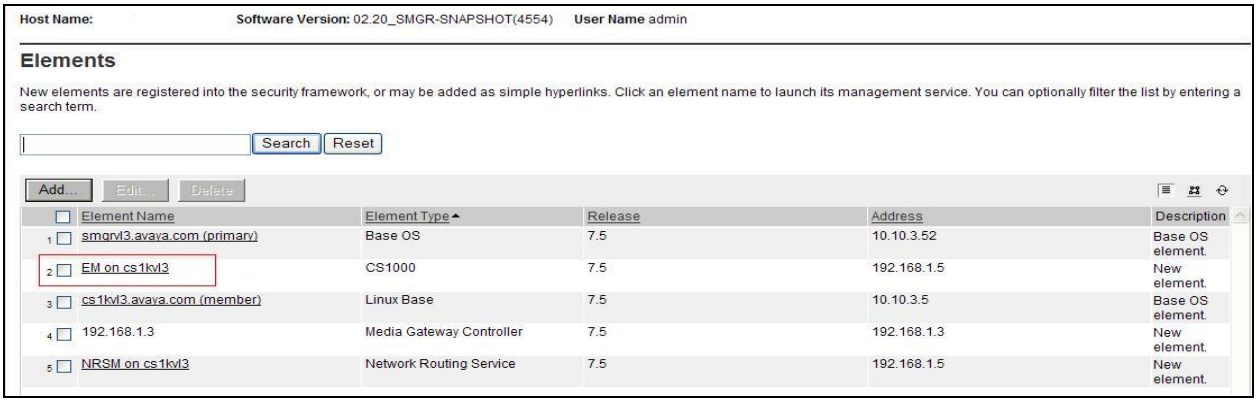
Configuration on the CS1000E will be performed by using both SSH Putty session and Avaya Unified Communications Management GUI.

Log in using SSH to the ELAN IP address of the Call Server using a user with correct privileges. Once logged in type **csconsole,** this will take the user into the vxworks shell of the call server. Next type **login**, the user will then be asked to login with correct credentials. Once logged in the user can then progress to load any overlay.

Log in using the web based Avaya Unified Communications Management GUI. The Avaya Unified Communications Management GUI may be launched directly via http://<ipaddress> where the relevant <ipaddress> is the TLAN ip address of the CS1000E.
The following screen shows the login screen. Login with the appropriate credentials.



The Avaya Unified Communications Management Elements page will be displayed and used for configuration. Click on the element name corresponding to CS1000E in the Element Type column. In the abridged screen below, the user would click on the Element Name **EM on cs1kvl3**.



5.2. Confirm System Features

The keycode installed on the Call Server controls the maximum values for these attributes. If a required feature is not enabled or there is insufficient capacity, contact an authorized Avaya sales representative to add additional capacity. Use the CS1000E system terminal and manually load overlay 22 to print the System Limits (the required command is **SLT**), and verify that the number of **SIP Access Ports** reported by the system is sufficient for the combination of trunks to Vodafone's network, and any other SIP trunks needed. See the following screenshot for a typical System Limits printout. The value of **SIP ACCESS PORTS** defines the maximum number of SIP trunks for the CS1000E.

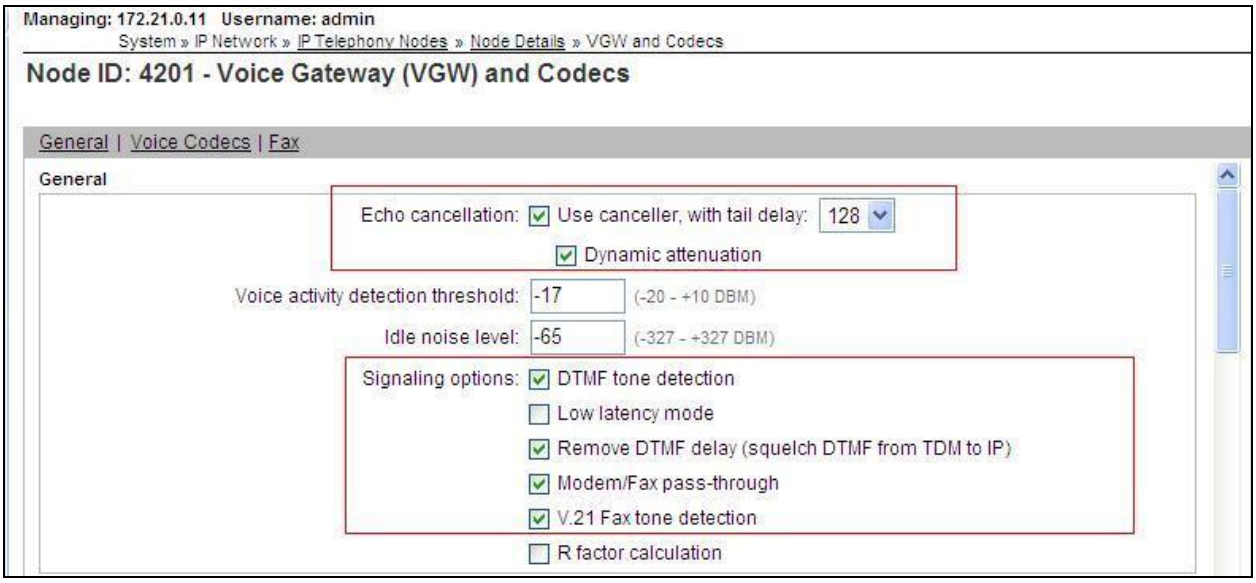
```
System type is - Communication Server 1000E/CPPM Linux
CPPM - Pentium M 1.4 GHz

IPMGs Registered:               1
IPMGs Unregistered:             0
IPMGs Configured/unregistered:  0

TRADITIONAL TELEPHONES    11    LEFT     1    USED    10
DECT USERS                 0    LEFT     0    USED     0
IP USERS                 116    LEFT   110    USED     6
BASIC IP USERS             0    LEFT     0    USED     0
TEMPORARY IP USERS         0    LEFT     0    USED     0
DECT VISITOR USER          0    LEFT     0    USED     0
ACD AGENTS                10    LEFT    10    USED     0
MOBILE EXTENSIONS        200    LEFT   199    USED     1
TELEPHONY SERVICES       100    LEFT    97    USED     3
CONVERGED MOBILE USERS     0    LEFT     0    USED     0
AVAYA SIP LINES            5    LEFT     3    USED     2
THIRD PARTY SIP LINES      2    LEFT     2    USED     0

PCA                      240    LEFT   240    USED     0
ITG ISDN TRUNKS            0    LEFT     0    USED     0
H.323 ACCESS PORTS         0    LEFT     0    USED     0
AST                      474    LEFT   474    USED     0
SIP CONVERGED DESKTOPS     0    LEFT     0    USED     0
SIP CTI TR87             120    LEFT   120    USED     0
SIP ACCESS PORTS          78    LEFT     4    USED    74
```

Load **overlay 21**, and confirm the customer is setup to use **ISDN** trunks (see below).

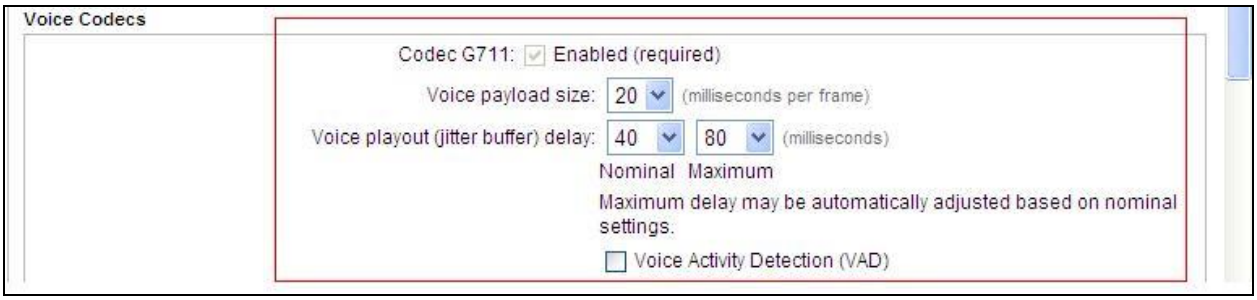
```
REQ: prt
TYPE: net
TYPE NET_DATA
CUST 0

TYPE NET_DATA
CUST 00
OPT RTD
AC1 INTL NPA SPN NXX LOC
AC2
FNP YES
ISDN YES
```

5.3. Configure Codec's for Voice and FAX Operation

Vodafone FMC Trunk service supports G.711A and G.729 codec's. Using the CS1000E element manager sidebar, navigate to the **IP Network → IP Telephony Nodes → Node Details → VGW Gateway (VGW) and Codec's** property page and configure the CS1000E General codec settings as in the next screenshot.



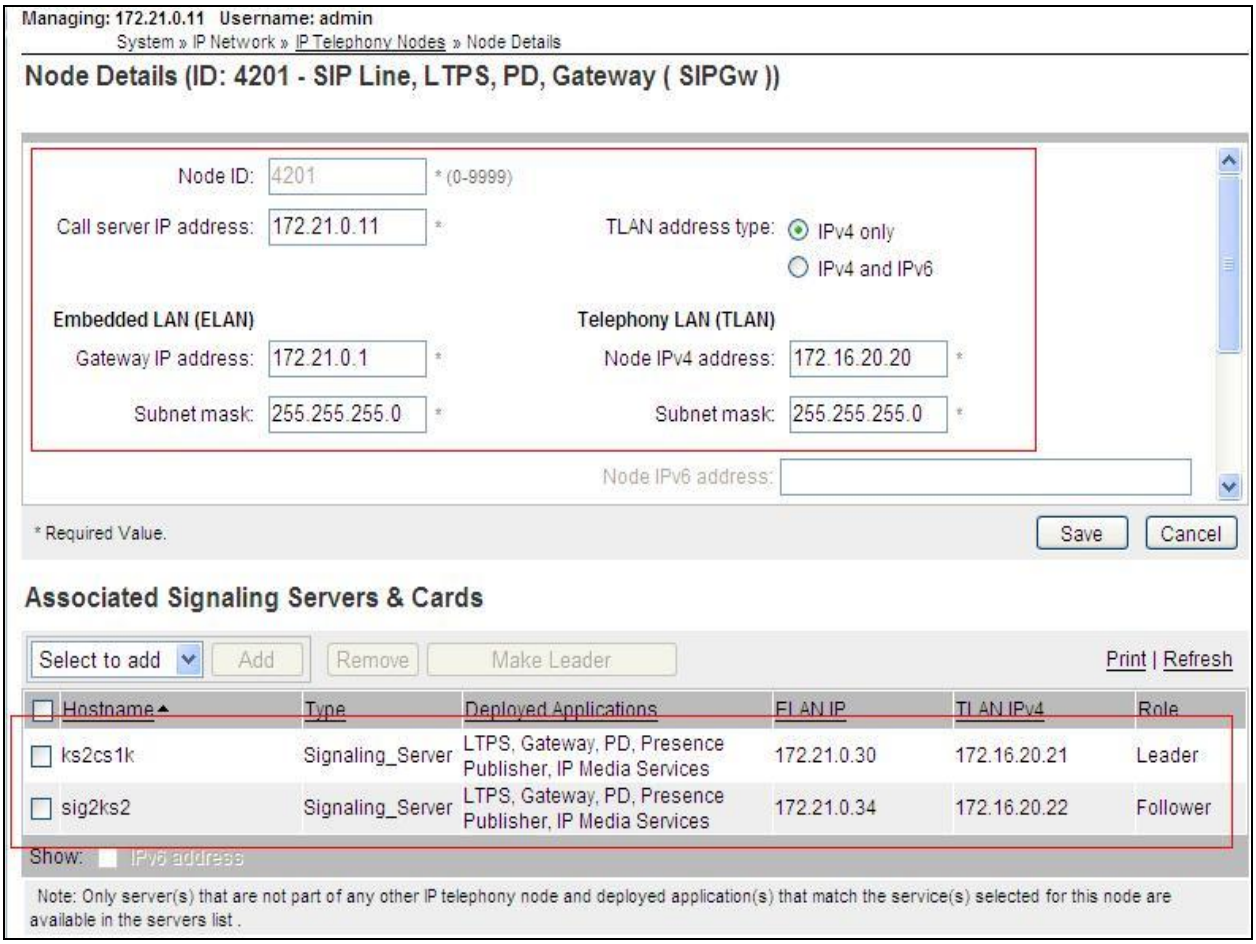
Next, scroll down and configure the **Codec G.711**. The relevant settings are highlighted in the following screenshot.



Next, scroll down and configure the **Codec G.729**. The relevant settings are highlighted in the following screenshot.

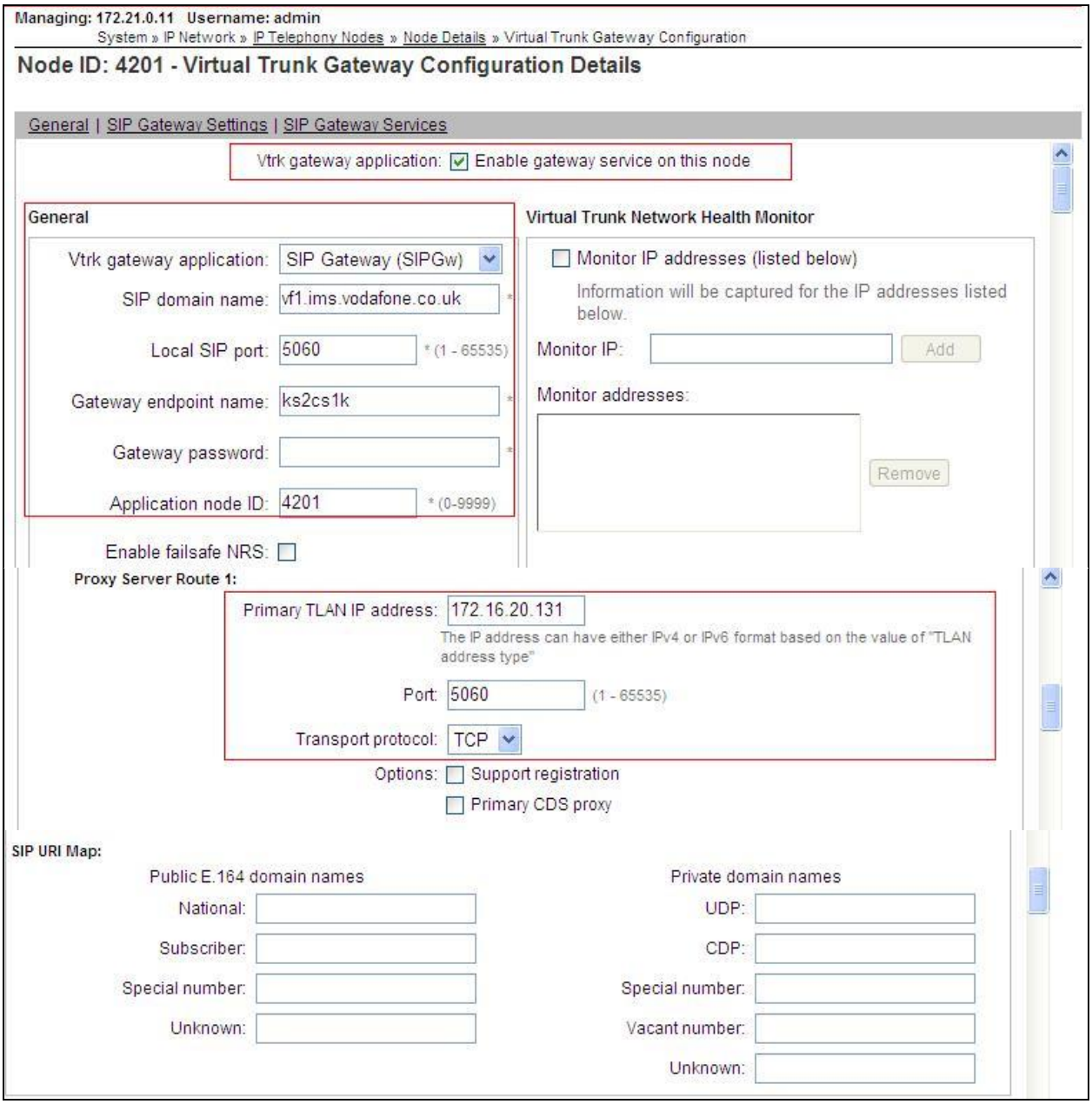
5.4. Virtual Trunk Gateway Configuration

Use CS1000E Element Manager to configure the system node properties. Navigate to the **System → IP Networks → IP Telephony Nodes → Node Details** and verify the highlighted section is completed with the correct IP addresses and subnet masks of the Node. The Node IP is the IP address that the IP phones use to register. This is also where the SIP trunk connection is made to the Session Manager. When an entity link is added in Session Manager for the CS1000E it is the **Node IPv4 address** that is used (please see **Section 6.5** – Define SIP Entities for more details).



The next two screenshots show the SIP Virtual Trunk Gateway configuration, navigate to **System → IP Networks → IP Telephony Nodes → Node Details → Gateway (SIPGW) Virtual Trunk Configuration Details** and fill in the highlighted areas with the relevant settings.

- **Vtrk gateway application:** Provides option to select Gateway applications. The three supported modes are **SIP Gateway (SIPGw)**, **H.323Gw**, and **SIPGw & H323Gw**.
- **SIP domain name:** The SIP Domain Name is the SIP Service Domain. The SIP Domain Name configured in the Signaling Server properties must match the Service Domain name configured in the Session Manager. **vf1.ims.vodafone.co.uk** was used in the compliance testing.
- **Local SIP port:** The Local SIP Port is the port to which the gateway listens. The default value is **5060**.
- **Gateway endpoint name:** This field cannot be left blank so a value is needed here. This field is used when a Network Routing Server is used for registration of the endpoint. In this network a Session Manager is used so any value can be put in here and will not be used.
- **Application node ID:** This is a unique value that can be alphanumeric and is for the new Node that is being created, in this case **4201**.
- **Proxy or Redirect Server:** Primary TLAN IP address is the Security Module IP address of the Session Manager. The **Transport protocol** used for **SIP**, in this case is TCP.
- **SIP URI Map: Public National** and **Private Unknown** are left blank. All other fields in the SIP URI Map are left with default values.



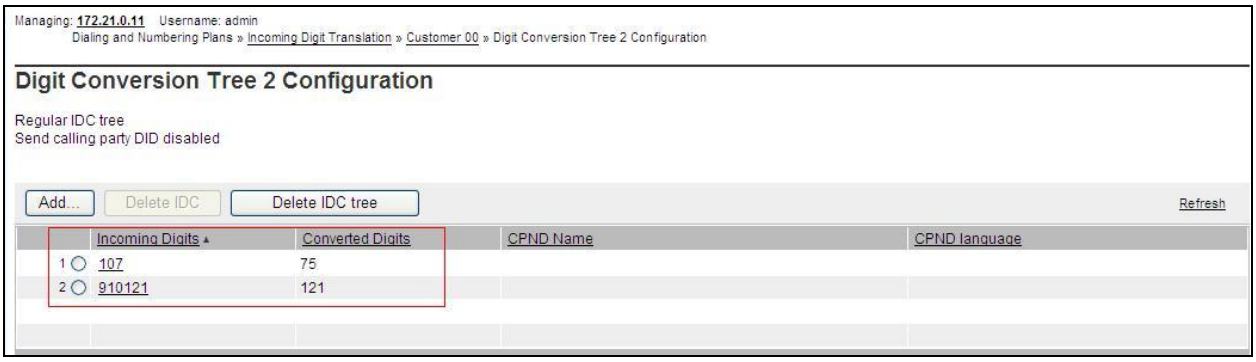
5.5. Configure Bandwidth Zones

Bandwidth Zones are used for alternate call routing between IP stations and for Bandwidth Management. SIP trunks require a unique zone, not shared with other resources and best practice dictates that IP telephones and Media Gateways are all placed in separate zones. In the sample configuration SIP trunks use zone 14 and IP & SIP telephones use zone 01, system defaults were used for each zone other than the parameter configured for **Zone Intent**. For SIP Trunks (zone 14), **VTRK** is configured for **Zone Intent**. For IP and SIP Telephones (zone 01), **MO** is configured for **Managed Office**.

Use Element Manager to define bandwidth zones as in the following highlighted example. Use Element Manager and navigate to **System → IP Network → Zones → Bandwidth Zones** and add new zones as required.

5.6. Configure Incoming Digit Conversion Table

A limited number of Direct Dial Inwards (DDI) numbers were available. The IDC table was configured to translate incoming PSTN numbers to four digit local telephone extension numbers. The digits of the actual PSTN DDI number are obscured for security reasons. The following screenshot shows the incoming PSTN numbers converted to local extension numbers. These were altered during testing to map to various SIP, Analog, Digital or Unistim telephones depending on the particular test case being executed.



5.7. Configure SIP Trunks

CS1000E virtual trunks will be used for all inbound and outbound PSTN calls to Vodafone's FMC Trunk service. Six separate steps are required to configure CS1000E virtual trunks.

- Configure a D-Channel Handler (**DCH**); configure using the CS1000E system terminal and overlay 17
- Configure a SIP trunk Route Data Block (**RDB**); configure using the CS1000E system terminal and overlay 16
- Configure SIP trunk members; configure using the CS1000E system terminal and overlay 14
- Configure a Digit Manipulation Data Block (**DGT**), configure using the CS1000E system terminal and overlay 86
- Configure a Route List Block (**RLB**); configure using the CS1000E system terminal and overlay 86
- Configure Co-ordinated Dialling Plan(s) (**CDP**); configure using the CS1000E system terminal and overlay 87

The following is an example DCH configuration for SIP trunks. Load **Overlay 17** at the CS1000E system terminal and enter the following values. The highlighted entries are required for correct SIP trunk operation. Exit overlay 17 when completed.

```
Overlay 17
ADAN     DCH 66
  CTYP DCIP
  DES  VIR_TRK
  USR  ISLD
  ISLM 4000
  SSRC 1800
  OTBF 32
  NASA YES
  IFC  SL1
  CNEG 1
  RLS  ID  5
  RCAP ND2
  MBGA NO
  H323
    OVLR NO
    OVLS NO
```

Next, configure the SIP trunk Route Data Block (RDB) using the CS1000E system terminal and overlay 16. Load **Overlay 16**, enter **RDB** at the prompt, press return and commence configuration. The value for **DCH** is the same as previously entered in overlay 17. The value for **NODE** should match the node value in **Section 5.4**. The value for **ZONE** should match that used in **Section 5.5** for **VTRK**. The remaining highlighted values are important for correct SIP trunk operation.

```
Overlay 16
TYPE: RDB
CUST 00
ROUT 1
TYPE RDB
CUST 00
ROUT 66
DES  SIPRT
TKTP TIE
NPID_TBL_NUM   0
ESN  NO
RPA  NO
CNVT NO
SAT  NO
RCLS EXT
VTRK YES
ZONE 00014
PCID SIP
CRID NO
NODE 4201
DTRK NO
ISDN YES
    MODE ISLD
    DCH  66
    IFC  SL1
    PNI  00001
    NCNA YES
    NCRD YES
    TRO  YES
    FALT NO
    CTYP UKWN
    INAC NO
    ISAR NO
    DAPC NO
MBXR YES
MBXOT NPA
MBXT 0
PTYP ATT
CNDP UKWN
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB YES
STEP
```

```
ACOD 89966
TCPP NO
PII NO
AUXP NO
TARG
CLEN 1
BILN NO
OABS
INST
IDC  YES
DCNO 2
NDNO 2 *
DEXT NO
DNAM NO
SIGO STD
STYP SDAT
MFC  NO
ICIS YES
OGIS YES
TIMR ICF  1920
     OGF  1920
     EOD  13952
     LCT  256
     DSI  34944
     NRD  10112
     DDL  70
     ODT  4096
     RGV  640
     GTO  896
     GTI  896
     SFB  3
     PRPS  800
     NBS  2048
     NBL  4096
     IENB  5
     TFD  0
     VSS  0
     VGD  6
     EESD  1024
SST  5 0
DTD  NO
SCDT NO
2 DT NO
NEDC ORG
FEDC ORG
```

```
CPDC NO
DLTN NO
HOLD 02 02 40
SEIZ 02 02
SVFL 02 02
DRNG NO
CDR  NO
NATL YES
SSL
CFWR NO
IDOP NO
VRAT NO
MUS  YES
MRT  21
PANS YES
RACD NO
MANO NO
FRL  0 0
FRL  1 0
FRL  2 0
FRL  3 0
FRL  4 0
FRL  5 0
FRL  6 0
FRL  7 0
OHQ  NO
OHQT 00
CBQ  NO
AUTH NO
TTBL 0
ATAN NO
OHTD NO
PLEV 2
OPR  NO
ALRM NO
ART  0
PECL NO
DCTI 0
TIDY 1600 100
ATRR NO
TRRL NO
SGRP 0
ARDN NO
CTBL 0
AACR NO
```

Next, configure virtual trunk members using the CS1000E system terminal and **Overlay 14**. Configure sufficient trunk members to carry both incoming and outgoing PSTN calls. The following example shows a single SIP trunk member configuration. Load **Overlay 14** at the system terminal and type **new X**, where X is the required number of trunks. Continue entering data until the overlay exits. The **RTMB** value is a combination of the **ROUT** value entered in the previous step and the first trunk member (usually 1). The remaining highlighted values are important for correct SIP trunk operation.

```
Overlay 14
TN   100 0 0 0
DATE
PAGE
DES  SIP_TRK
TN   100 0 00 00  VIRTUAL
TYPE IPTI
CDEN 8D
CUST 0
XTRK VTRK
ZONE 00014
TIMP 600
BIMP 600
AUTO_BIMP NO
NMUS NO
TRK  ANLG
NCOS 0
RTMB 66 1
CHID 1
TGAR 1
STRI/STRO WNK WNK
SUPN YES
AST  NO
IAPG 0
CLS  UNR DTN CND ECD WTA LPR APN THFD XREP SPCD MSBT
     P10 NTC
TKID
AACR NO
```

Next, configure a Digit Manipulation data block (DGT) in overlay 86. Load **Overlay 86** at the system terminal and type **new**. The following example shows the values used. The value for **DMI** is the same as when inputting the **DMI** value during configuration of the Route List Block.

```
Overlay 86
CUST 0
FEAT dgt
DMI  0
DEL  0
ISPN NO
CTYP INTL
```

Configure a Route List Block (RLB) in overlay 86. Load **Overlay 86** at the system terminal and type **new**. The following example shows the values used. The value for **ROUT** is the same as previously entered in overlay 16. The **RLI** value is unique to each RLB.

```
Overlay 86
CUST 0
FEAT rlb
RLI  2
ELC  NO
ENTR 0
LTER NO
ROUT 66
TOD  0 ON  1 ON  2 ON  3 ON
     4 ON  5 ON  6 ON  7 ON
VNS  NO
SCNV NO
CNV  NO
EXP  NO
FRL  0
DMI  0
CTBL 0
ISDM 0
```

```
FCI  0
FSNI 0
BNE  NO
DORG NO
SBOC NRR
PROU 1
IDBB DBD
IOHQ NO
OHQ  NO
CBQ  NO

ISET 0
NALT 5
MFRL 0
OVLL 0
```

Next, configure Co-ordinated Dialling Plan(s) (CDP) which users will dial to reach PSTN numbers. Use the CS1000E system terminal and **Overlay 87**. The following are some example CDP entries used. The highlighted **RLI** value previously configured in overlay 86 is used as the Route List Index (**RLI**), this is the default PSTN route to the SIP Trunk service.

```
TSC  003
FLEN 16
RRPA NO
RLI  2
```

```
TSC  009
FLEN 16
RRPA NO
RLI  2
```

```
TSC  0128320
FLEN 11
RRPA NO
RLI  2
```

```
TSC  0128327
FLEN 11
RRPA NO
RLI  2
```

5.8. Configure Analog, Digital and IP Telephones

A variety of telephone types were used during the testing, the following is the configuration for the Avaya 1140e Unistim IP telephone. Load **Overlay 20** at the system terminal and enter the following values. A unique four digit number is entered for the **KEY 00**. The value for **CFG_ZONE** is the value used in **Section 5.5** for IP and SIP Telephones.

```
Overlay 20 IP Telephone configuration
DES  1140
TN   248 0 00 02  VIRTUAL
TYPE 1140
CDEN 8D
CTYP XDLC
CUST 0
NUID
NHTN
CFG_ZONE 00001
CUR_ZONE 00001
ERL  0
ECL  0
FDN  0
TGAR 0
LDN  NO
NCOS 0
SGRP 0
RNPG 1
SCI  0
SSU
LNRS 16
XLST
SCPW
SFLT NO
CAC_MFC 0
CLS  UNR FBA WTA LPR PUA MTD FNA HTA TDD HFA CRPD
     MWA LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
     POD SLKD CCSD SWD LNA CNDA
     CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBD
     ICDA CDMD LLCN MCTD CLBD AUTR
     GPUD DPUD DNDA CFXA ARHD FITD CLTD ASCD
     CPFA CPTA ABDD CFHD FICD NAID BUZZ AGRD MOAD
     UDI RCC HBTA AHD IPND DDGA NAMA MIND PRSD NRWD NRCD NROD
     DRDD EXR0
     USMD USRD ULAD CCBD RTDD RBDD RBHD PGND OCBD FLXD FTTC DNDY DNO3 MCBN
     FDSD NOVD VOLA VOUD CDMR PRED RECA MCDD T87D SBMD KEM3 MSNV FRA  PKCH MUTA MWTD

---continued on next page----
```

```
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DVLD CROD CROD
CPND_LANG ENG
RCO  0
HUNT 0
LHK  0
PLEV 02
PUID
DANI NO
AST  00
IAPG 1
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
MLNG ENG
DNDR 0
KEY  00 MCR 7520 0     MARP
        CPND
          CPND_LANG ROMAN
            NAME IP1140
            XPLN 10
            DISPLAY_FMT FIRST,LAST
     01 HNDO
     02
     03 BSY
     04 DSP
     05
     06
     07
     08
     09
     10
     11
     12
     13
     14
     15
     16
     17 TRN
     18 AO6
     19 CFW 16
     20 RGA
     21 PRK
     22 RNP
     23
     24 PRS
     25 CHG
     26 CPN
```

Digital telephones are configured using the **Overlay 20**, the following is a sample **3904** digital set configuration. Again, a unique number is entered for the **KEY 00** value.

```
Overlay 20 – Digital Set configuration
TYPE: 3904
DES  3904
TN   000 0 01 02  VIRTUAL
TYPE 3904
CDEN 8D
CTYP XDLC
CUST 0
MRT
ERL  0
FDN  0
TGAR 0
LDN  NO
NCOS 0
SGRP 0
RNPG 1
SCI  0
SSU
LNRS 16
XLST
SCPW
SFLT NO
CAC_MFC 0
CLS  UNR FBD WTA LPR PUA MTD FND HTD TDD HFA GRLD CRPA STSD
     MWA LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
     POD SLKD CCSD SWD LNA CNDA
     CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBD
     ICDA CDMA LLCN MCTD CLBD AUTU
     GPUD DPUD DNDA CFXA ARHD FITD CNTD CLTD ASCD
     CPFA CPTA ABDA CFHD FICD NAID BUZZ AGRD MOAD
     UDI RCC HBTD AHA IPND DDGA NAMA MIND PRSD NRWD NRCD NROD
     DRDD EXR0
     USMD USRD ULAD CCBD RTDD RBDD RBHD PGND OCBD FLXD FTTC DNDY DNO3 MCBN
     FDSD NOVD CDMR PRED RECA MCDD T87D SBMD PKCH CROD CROD
CPND_LANG ENG
RCO  0
HUNT
PLEV 02
PUID
DANI NO
SPID NONE
AST
IAPG 1
AACS
ACQ
ASID
SFNB
SFRB
USFB
CALB
FCTB
ITNA NO
DGRP
PRI  01
MLWU_LANG 0
```

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```
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MLNG ENG
DNDR 0
KEY  00 MCR 7526 0     MARP
        CPND
          CPND_LANG ROMAN
            NAME Digital Set
            XPLN 10
            DISPLAY_FMT FIRST,LAST
     02
     03
     04
     05
     06
     07
     08
     09
     10
     11
     12
     13
     14
     15
     16
     17 TRN
     18 AO6
     19 CFW 16
     20 RGA
     21 PRK
     22 RNP
     23
     24 PRS
     25 CHG
     26 CPN
     27 CLT
     28 RLT
     29
     30
     31
```

Analog telephones are also configured using **Overlay 20**, the following example shows an analog port configured for Plain Ordinary Telephone Service (POTS). A unique value is entered for **DN**, this is the extension number. **DTN** is required if the telephone uses DTMF dialing.

```
Overlay 20 – Analog Telephone Configuration
DES  500
TN   04 0 03 00
TYPE 500
CDEN 4D
CUST 0
MRT

ERL 00000
WRLS NO
DN   5015
AST  NO
IAPG 0
HUNT
TGAR 0
LDN  NO
NCOS 0
SGRP 0
RNPG 0
XLST
SCI  0
SCPW
SFLT NO
CAC_MFC 0
CLS  UNR DTN FBD XFD WTA THFD FND HTD ONS
     LPR XRD AGRD CWD SWD MWD RMMD SMWD LPD XHD SLKD CCSD LND TVD
     CFTD SFD MRD C6D CNID CLBD AUTU
     ICDD CDMD LLCN EHTD MCTD
     GPUD DPUD CFXD ARHD OVDD AGTD CLTD LDTD ASCD SDND
     MBXD CPFA CPTA UDI RCC HBTD IRGD  DDGA NAMA MIND
     NRWD NRCD NROD SPKD CRD PRSD MCRD
     EXR0 SHL SMSD ABDD CFHD DNDY DNO3
     CWND USMD USRD CCBD BNRD OCBD RTDD RBDD RBHD FAXA CNUD CNAD PGND FTTC
     FDSD NOVD CDMR PRED MCDD T87D SBMD PKCH MPTD
PLEV 02
PUID
AACS NO
MLWU_LANG 0
FTR  DCFW 4
```

5.9. Configure the SIP Line Gateway Service

SIP terminal operation requires the Communication Server node to be configured as a SIP Line Gateway (SLG) before SIP telephones can be configured. Prior to configuring the SIP Line node properties, the SIP Line service must be enabled in the customer data block. Use the CS1000E system terminal and **Overlay 15** to activate SIP Line services, as in the following example where **SIPL_ON** is set to **YES**.

```
SLS_DATA
  SIPL_ON YES
  UAPR 11
  NMME NO
```

If a numerical value is entered against the **UAPR** setting, this number will be pre appended to all SIP Line configurations, and is used internally in the SIP Line server to track SIP terminals. Use Element Manager and navigate to the **IP Network → IP Telephony Nodes → Node Details → SIP Line Gateway Configuration** page. See the following screenshot for highlighted critical parameters.

- **SIP Line Gateway Application:** Enable the SIP line service on the node, check the box to enable
- **SIP Domain Name:** The value must match that configured in **Section 6.2**
- **SLG endpoint name:** The endpoint name is the same endpoint name as the SIP Line Gateway and will be used for SIP gateway registration
- **SLG Local Sip port:** Default value is **5070**
- **SLG Local TLS port:** Default value is **5071**

5.10. Configure SIP Line Telephones

When SIP Line service configuration is completed, use the CS1000E system terminal and **Overlay 20** to add a Universal Extension (UEXT). See the following example of a SIP Line extension. The value for **UXTY** must be **SIPL**. This example is for an Avaya SIP telephone, so the value for **SIPN** is 1. The **SIPU** value is the username, **SCPW** is the logon password and these values are required to register the SIP telephone to the SLG. The value for **CFG_ZONE** is the value used in **Section 5.5** for IP and SIP Telephones. A unique telephone number is entered for value **KEY 00**. The value for **KEY 01** is comprised of the **UAPR** (set in **Section 5.8**) value and the telephone number used in **KEY 00**.

```
Overlay 20 – SIP Telephone Configuration
DES  SIPD
TN   100 0 01 10  VIRTUAL
TYPE UEXT
CDEN 8D
CTYP XDLC
CUST 0
UXTY SIPL
MCCL YES
SIPN 1
SIP3 0
FMCL 0
TLSV 0
SIPU 7528
NDID 4201
SUPR NO
SUBR DFLT MWI RGA CWI MSB
UXID
NUID 100
NHTN 100 0 01 10
CFG_ZONE 00001
CUR_ZONE 00001
ERL  0
ECL  0
VSIT NO
FDN
TGAR 0
LDN  NO
NCOS 0
SGRP 0
RNPG 0
SCI  0
SSU
XLST
SCPW 1234
SFLT NO
CAC_MFC 0
CLS  UNR FBD WTA LPR MTD FNA HTA TDD HFD CRPD
     MWD LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
     POD SLKD CCSD SWD LND CNDA
     CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBD
     ICDD CDMD LLCN MCTD CLBD AUTU
     GPUD DPUD DNDA CFXA ARHD FITD CLTD ASCD
     CPFA CPTA ABDD CFHD FICD NAID BUZZ AGRD MOAD
```

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```
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     UDI RCC HBTD AHA IPND DDGA NAMA MIND PRSD NRWD NRCD NROD
     DRDD EXR0
     USMD USRD ULAD CCBD RTDD RBDD RBHD PGND OCBD FLXD FTTC DNDY DNO3 MCBN
     FDSD NOVD VOLA VOUD CDMR PRED RECD MCDD T87D SBMD ELMD MSNV FRA  PKCH MWTD DVLD
CROD CROD
CPND_LANG ENG
RCO  0
HUNT
LHK  0
PLEV 02
PUID
DANI NO
AST
IAPG 0 *

AACS NO
ITNA NO
DGRP
MLWU_LANG 0
MLNG ENG
DNDR 0
KEY  00 SCR 7528 0     MARP
        CPND
          CPND_LANG ROMAN
            NAME Sigma 1140
            XPLN 11
            DISPLAY_FMT FIRST,LAST*
     01 HOT U 117528 MARP 0
     02
     03
     04
     05
     06
     07
     08
     09
     10
     11
     12
     13
     14
     15
     16
     17 TRN
     18 AO6
     19 CFW 16
     20 RGA
     21 PRK
     22 RNP
     23     *
     24 PRS
     25 CHG
     26 CPN
     27
     28
     29
     30
     31
```
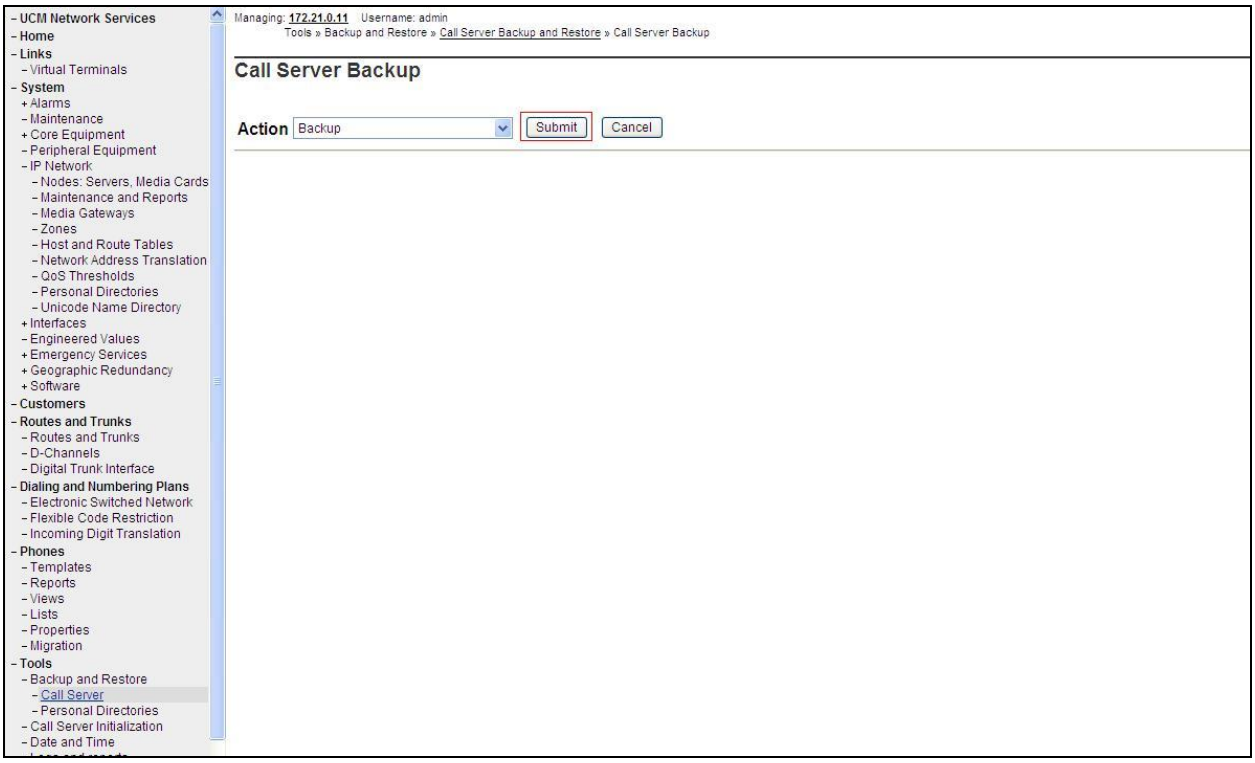

5.11. Save Configuration

Expand **Tools → Backup and Restore** on the left navigation panel and select **Call Server.** Select **Backup** and click **Submit** to save configuration changes as shown below.



Backup process will take several minutes to complete. Scroll to the bottom of the page to verify the backup process completed successfully as shown below.

Configuration of CS1000E is complete.

6. Configure Avaya Aura® Session Manager

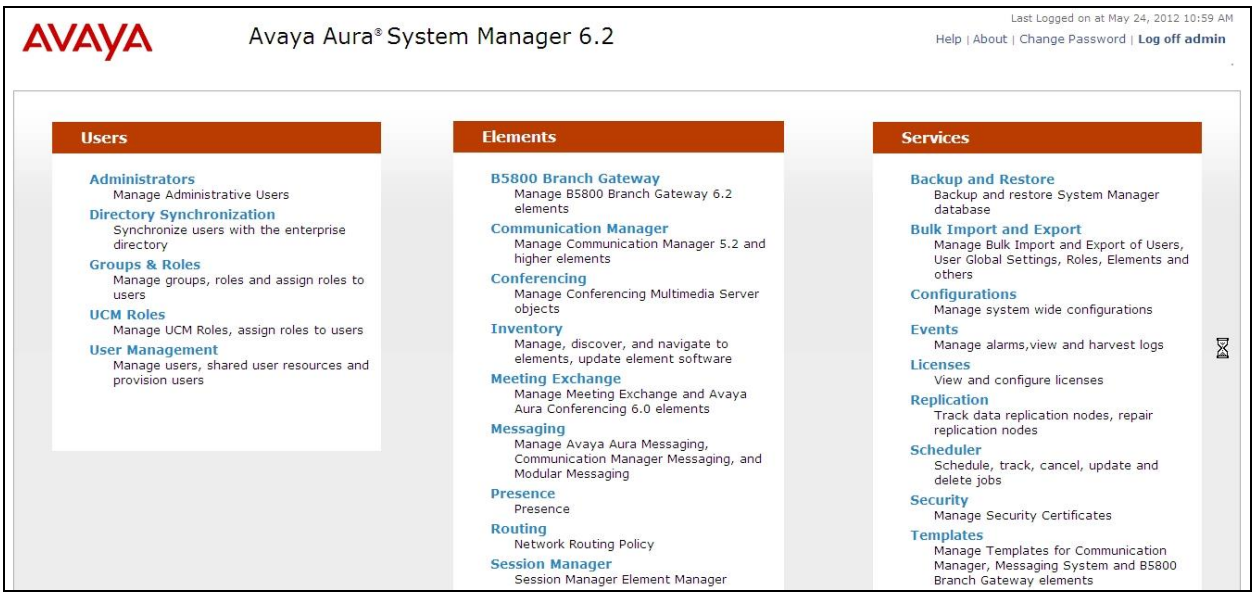
This section provides the procedures for configuring Session Manager. The procedures include adding the following items:

- SIP domain
- Logical/physical Location that can be occupied by SIP Entities
- Adaptation Modules
- SIP Entities corresponding to CS1000E, Avaya SBCE and Session Manager
- Entity Links, which define the SIP trunk parameters used by Session Manager when routing calls to/from SIP Entities
- Routing Policies, which control call routing between the SIP Entities
- Dial Patterns, which govern to which SIP Entity a call is routed
- Session Manager Instance, corresponding to the Session Manager server to be administered in System Manager

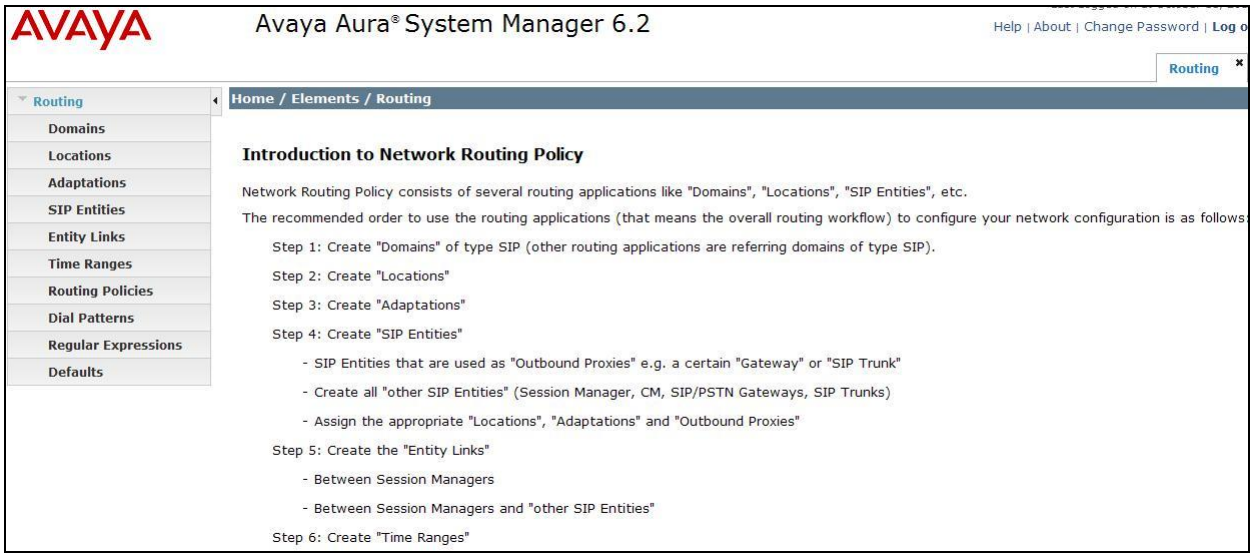
It may not be necessary to create all the items above when creating a connection to the service provider since some of these items would have already been defined as part of the initial Session Manager installation. This includes items such as certain SIP domains, locations, SIP entities, and Session Manager itself. However, each item should be reviewed to verify the configuration.

6.1. Avaya Aura® System Manager Login and Navigation

Session Manager configuration is accomplished by accessing the browser-based GUI of System Manager, using the URL https://<ip-address>/SMGR, where <ip-address> is the IP address of System Manager. Log in with the appropriate credentials and click on **Log On** (not shown). The screen shown below is then displayed.



Most of the configuration items are performed in the Routing Element. Click on **Routing** in the Elements column shown above to bring up the Introduction to Network Routing Policy screen.

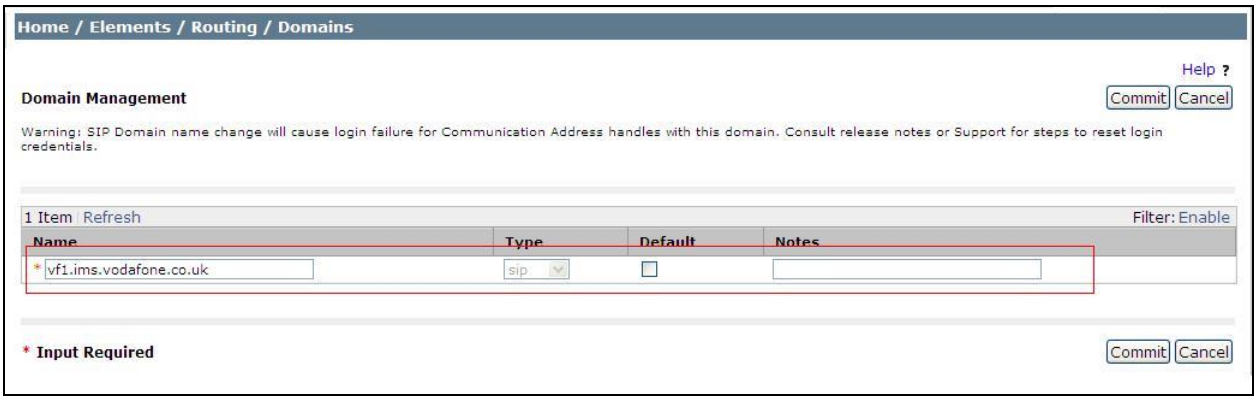


6.2. Define SIP Domain

Create a SIP domain for each domain for which Session Manager will need to be aware in order to route calls. Expand **Elements → Routing** and select **Domains** from the left navigation menu, click **New** (not shown)**.** Enter the following values and use default values for remaining fields**.**

- **Name** Enter the Domain Name specified for the SIP Gateway in **Section 5.4.** In the sample configuration, **vf1.ims.vodafone.co.uk** was used
- **Type** Verify **SIP** is selected
- **Notes** Add a brief description [Optional]

Click **Commit** to save. The screen below shows the SIP Domain defined for the sample configuration.



6.3. Define Location for Avaya Communication Server 1000E

Locations can be used to identify logical and/or physical locations where SIP Entities reside for purposes of bandwidth management and call admission control. To add a location, navigate to **Routing →Locations** in the left-hand navigation pane and click the **New** button in the right pane (not shown). In the **General** section, enter the following values. Use default values for all remaining fields:

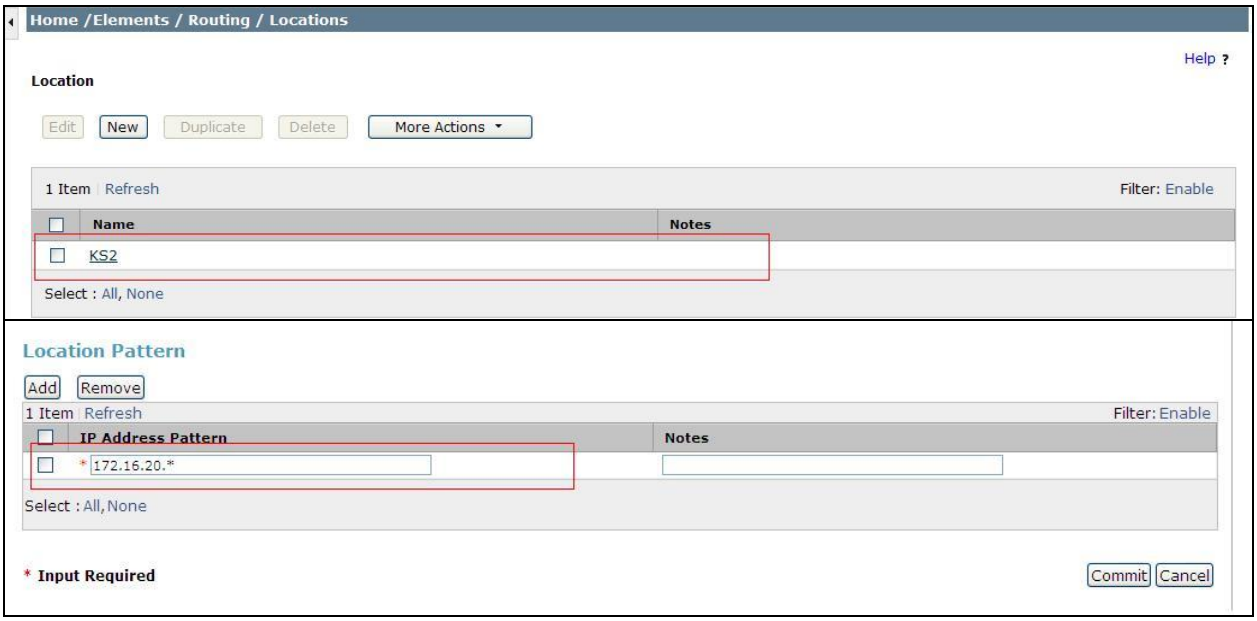
- **Name:** Enter a descriptive name for the location
- **Notes:** Add a brief description (optional)

The Location Pattern is used to identify call routing based on IP address. Session Manager matches the IP address against the patterns defined in this section. If a call is from a SIP Entity that does not match the IP address pattern then Session Manager uses the location administered for the SIP Entity.

In the **Location Pattern** section, click **Add** and enter the following values.

- **IP Address Pattern** Enter the logical pattern used to identify the location. For the sample configuration, **172.16.20.*** was used
- **Notes** Add a brief description [Optional]

Click **Commit** to save. The screenshot below shows the Location defined for CS1000E in the sample configuration.

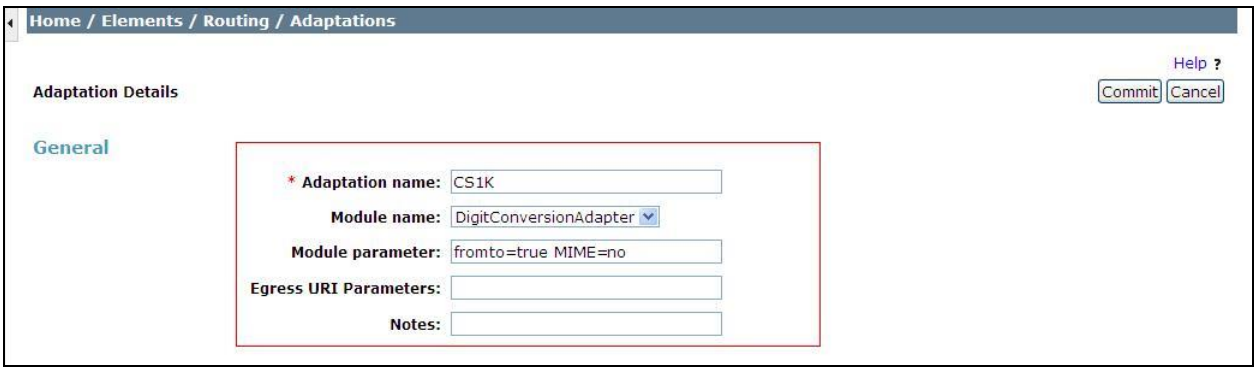


6.4. Configure Adaptation Module

Adaptations can be used to modify the called and calling party numbers to meet the requirements of the service. The called party number present in the SIP INVITE Request URI is modified by the **Digit Conversion** in the Adaptation. **MIME=no** strips MIME message bodies on egress from Session Manager to the Avaya SBCE. Additionally, the called and calling party numbers can be modified using **Digit Conversion** when **fromto=true** is entered in the **Module Parameters**.

To enable calls to be routed to stations on CS1000E, the Session Manager should be configured to modify the called party number to meet network requirements. Expand **Elements → Routing** and select **Adaptations** from the left navigational menu. Click **New** (not shown). In the **General** section, enter the following values and use default values for remaining fields.

- **Adaptation Name** Enter an identifier for the Adaptation Module
- **Module Name** Select **DigitConversonAdaptor** from drop-down menu
- **Module parameter** **MIME =no** Strips MIME message bodies on egress from Session Manager
  fromto=true →Modifies from and to headers of a message



6.5. Define SIP Entities

A SIP Entity must be added for Session Manager and for each SIP server connected to it, which includes CS1000E and Avaya SBCE. Navigate to **Routing → SIP Entities** in the left-hand navigation pane and click on the **New** button in the right pane (not shown).

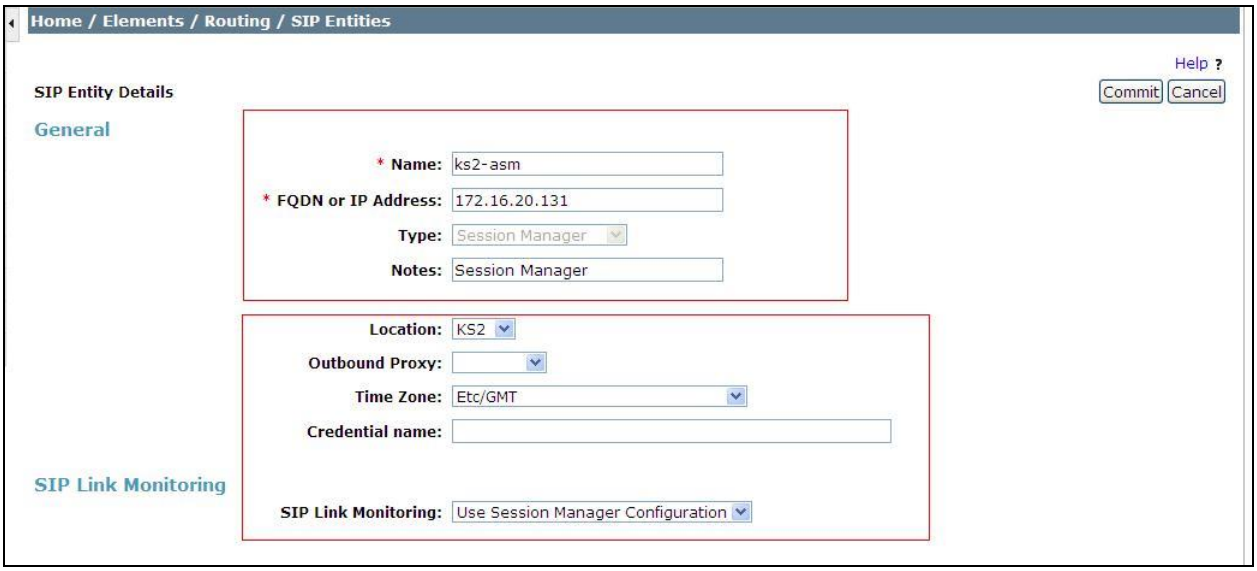
In the **General** section, enter the following values. Use default values for all remaining fields:

- **Name:** Enter a descriptive name
- **FQDN or IP Address:** Enter the FQDN or IP address of the SIP Entity that is used for SIP signaling
- **Type:** Enter **Session Manager** for Session Manager, **Other** for CS1000E and **Gateway** for Avaya SBCE
- **Adaptation:** This field is only present if **Type** is not set to **Session** Manager. If applicable, select the **Adaptation Name** that will applied to this entity
- **Location:** Select one of the locations defined previously
- **Time Zone:** Select the time zone for the location above

In the **SIP Link Monitoring** section:

- **SIP Link Monitoring** Select **Use Session Manager**

The following screen shows the addition of Session Manager. The IP address of the Session Manager signaling interface is entered for **FQDN or IP Address**.

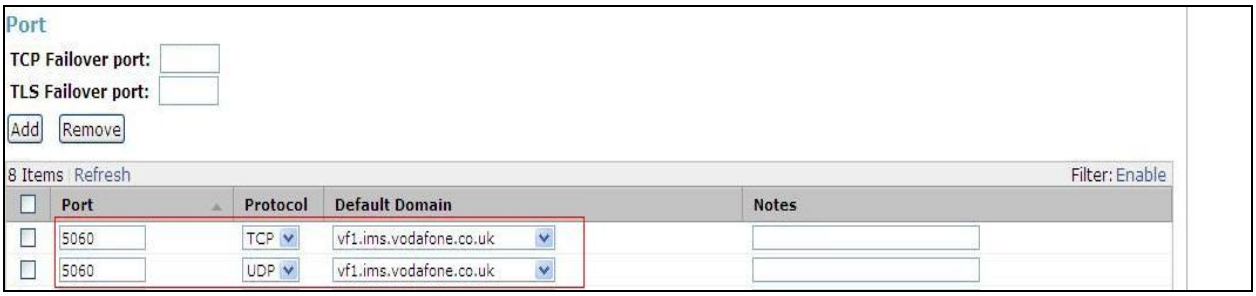


To define the ports used by Session Manager, scroll down to the **Port** section of the **SIP Entity Details** screen. This section is only present for **Session Manager** SIP entities. This section defines a default set of ports that Session Manager will use to listen for SIP requests, typically from registered SIP endpoints. Session Manager can also listen on additional ports defined elsewhere such as the ports specified in the SIP Entity Link definition in **Section 6.6**.

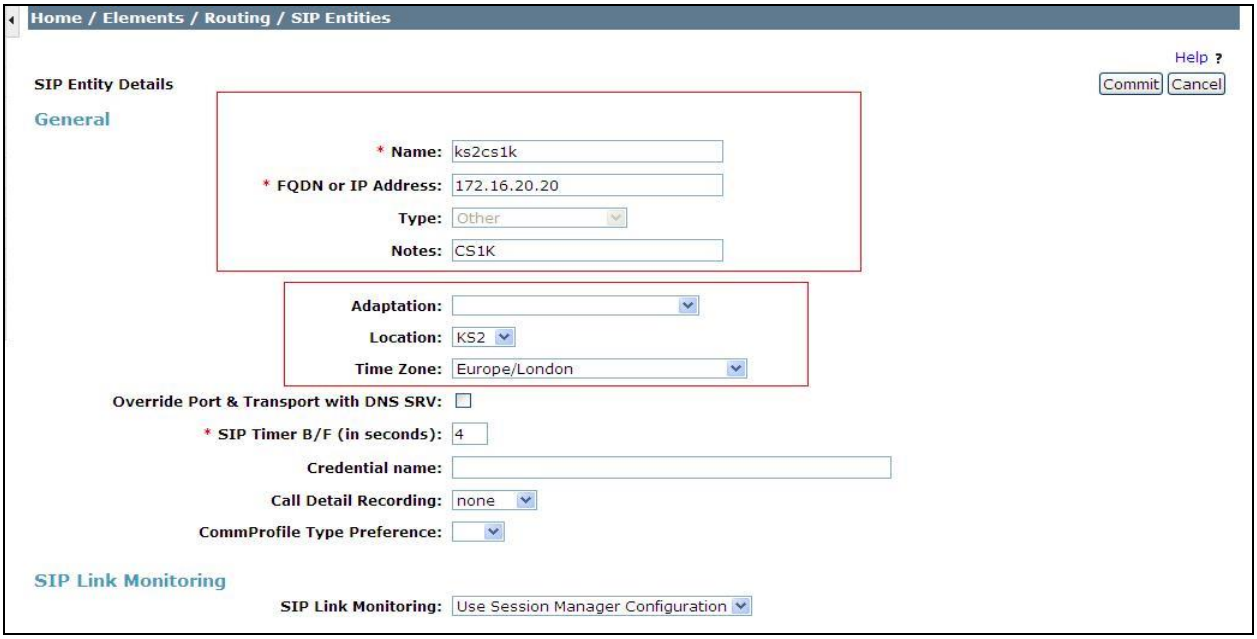
In the **Port** section, click **Add** and enter the following values. Use default values for all remaining fields:

- **Port:** Port number on which Session Manager can listen for requests
- **Protocol:** Transport protocol to be used to send SIP requests
- **Default Domain:** The domain used for the enterprise

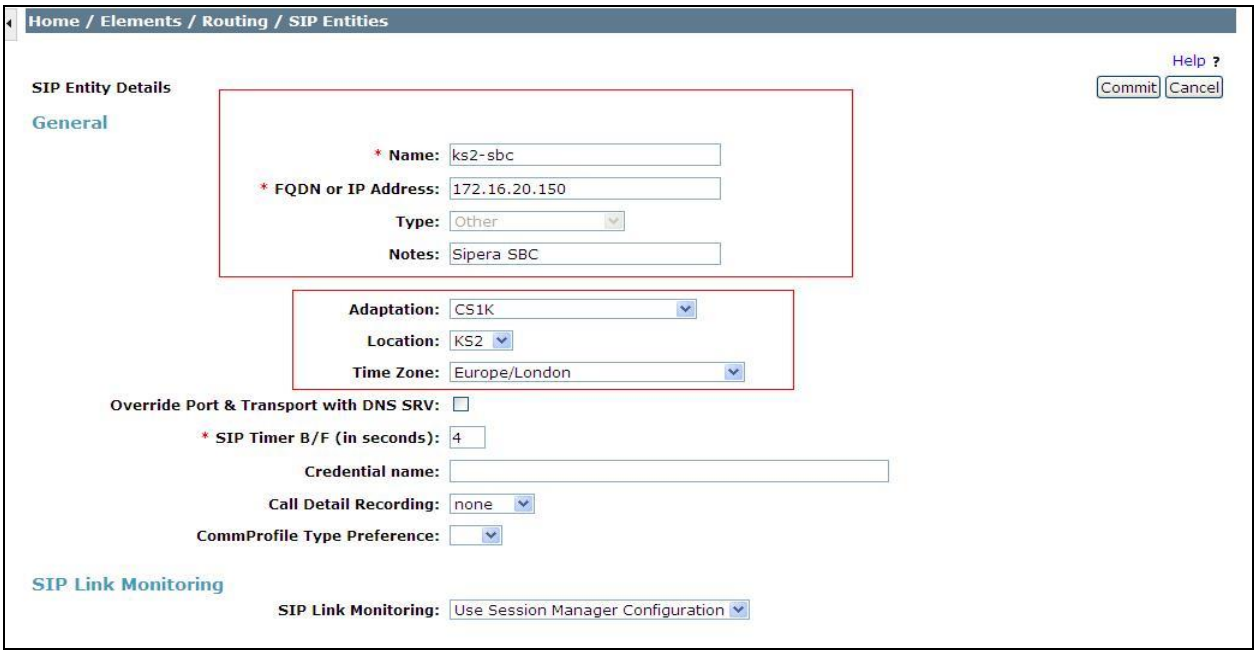
Defaults can be used for the remaining fields. Click **Commit** to save.



The following screen shows the addition of CS1000E SIP Entity. The **FQDN or IP Address** field is set to the TLAN Node IP address defined in **Section 5.4**.



The following screen shows the addition of Avaya SBCE SIP Entity. The **FQDN or IP Address** field is set to the IP address of its private network interface.



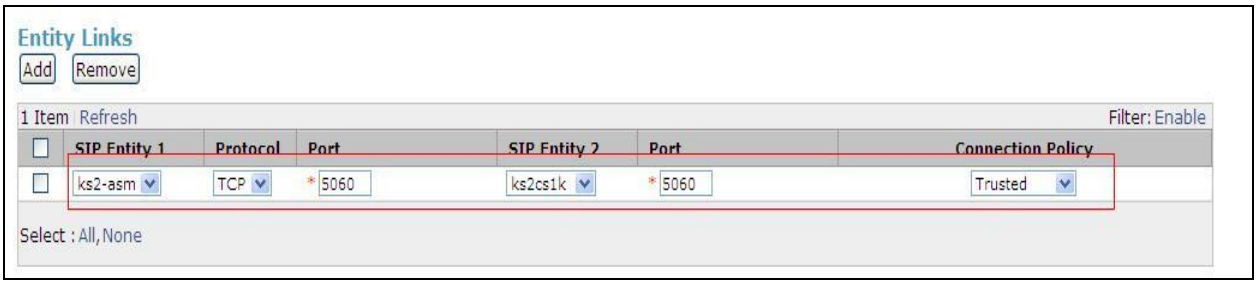
6.6. Define Entity Links

A SIP trunk between Session Manager and a telephony system is described as an Entity Link. Two Entity Links were created; one to CS1000E for use only by service provider traffic and one to Avaya SBCE. To add an Entity Link, navigate to **Routing → Entity Links** in the left-hand navigation pane and click on the **New** button in the right pane (not shown). Fill in the following fields in the new row that is displayed:

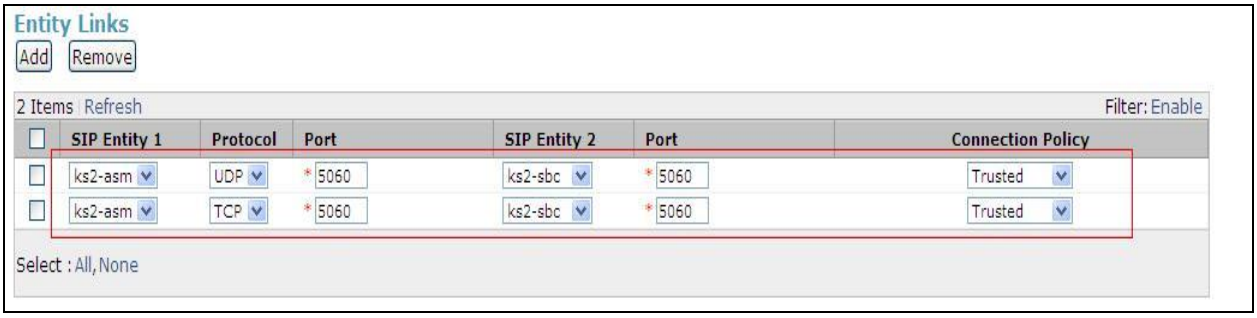
- **Name:** Enter a descriptive name
- **SIP Entity 1:** Select the SIP Entity for Session Manager
- **Protocol:** Select the transport protocol used for this link
- **Port:** Port number on which Session Manager will receive SIP requests from the far-end. Default listen port is **5060**
- **SIP Entity 2:** Select the name of the other system. Select the CS1000E or Avaya SBCE defined in **Section 6.5**
- **Port:** Port number on which the other system receives SIP requests from the Session Manager. Default listen port is **5060**
- **Trusted:** Select from the drop-down menu. **Note**: If this box is not checked, calls from the associated SIP Entity specified in **Section 6.5** will be denied

Click **Commit** to save. The following screens illustrate the Entity Links to CS1000E and Avaya SBCE.

Entity Link to CS1000E.



Entity Link to Avaya SBCE.



6.7. Define Routing Policies

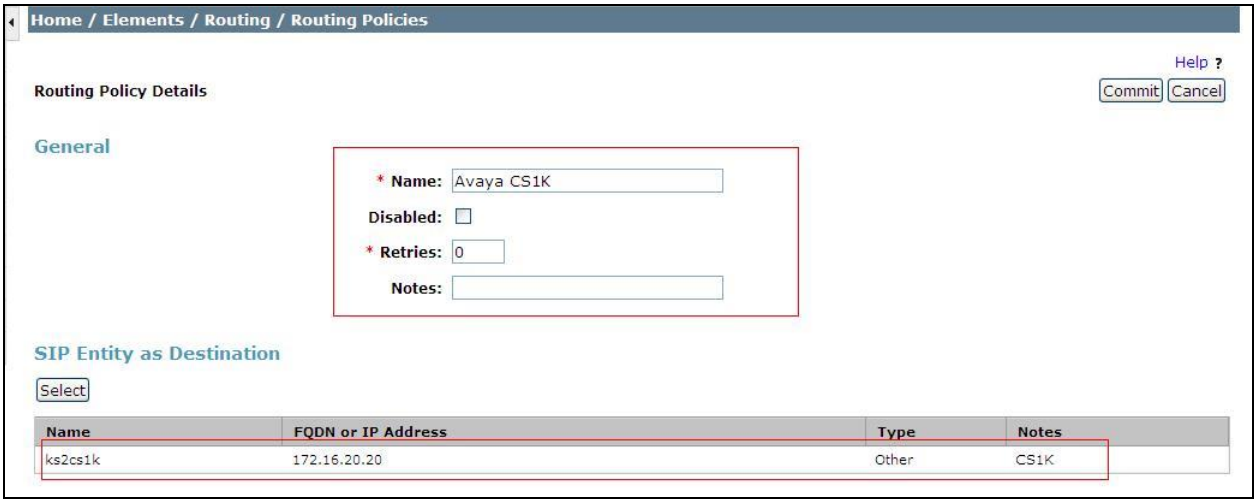
Routing policies describe the conditions under which calls will be routed to CS1000E from either SIP endpoint registered to Session Manager or from other telephony system. It also describes the routing polices for which calls will be routed to the Avaya SBCE and therefore to Vodafone's FMC Trunk service. To add a routing policy, Expand **Elements → Routing** and select **Routing Policies**. Click **New** (not shown). In the **General** section, enter the following values.

- **Name** Enter an identifier to define the routing policy
- **Disabled** Leave unchecked
- **Notes** Enter a brief description [Optional]

In the **SIP Entity as Destination** section, click **Select.** The **SIP Entity List** page opens (not shown). For routing policy to the CS1000E, select the SIP Entity associated with CS1000E defined in **Section 6.5** and click **Select**. The selected SIP Entity displays on the **Routing Policy Details** page. Use default values for remaining fields. Click **Commit** to save Routing Policy definition.

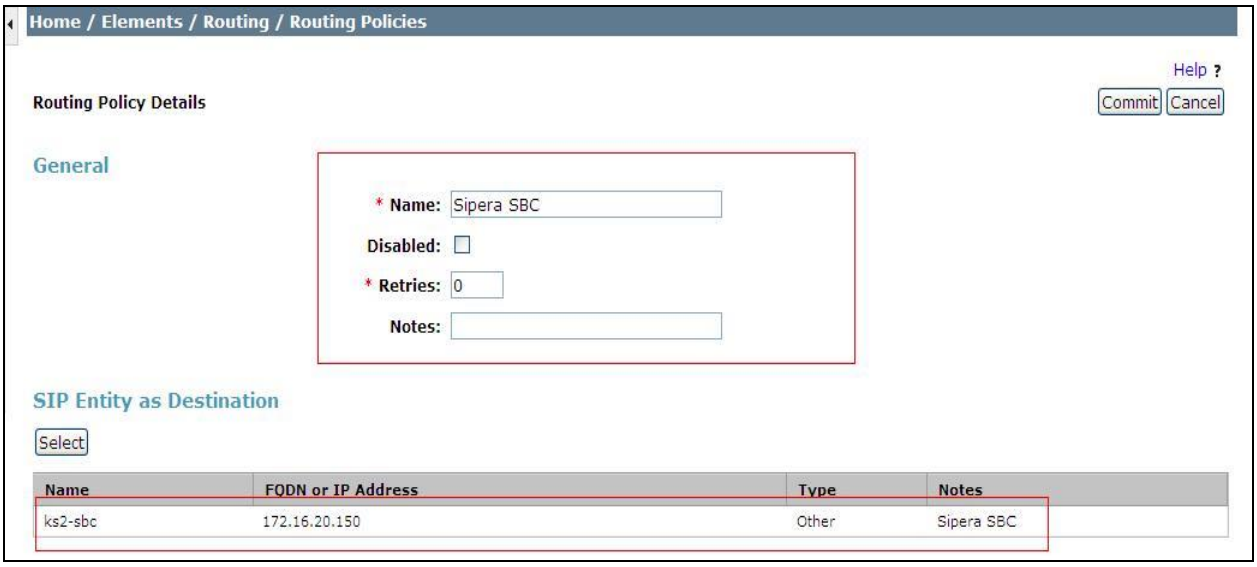
Note: The routing policy defined in this section is an example and was used in the sample configuration. Other routing policies may be appropriate for different customer networks.

The following screenshot shows the Routing Policy for CS1000E.



For routing policy to the Avaya SBCE – Vodafone's FMC Trunk service, select the SIP Entity associated with Avaya SBCE defined in **Section 6.5** and click **Select**. The selected SIP Entity displays on the **Routing Policy Details** page. Use default values for remaining fields. Click **Commit** to save Routing Policy definition.

The following screenshot shows the Routing Policy for Avaya SBCE – Vodafone's FMC Trunk service.



6.8. Define Dial Patterns

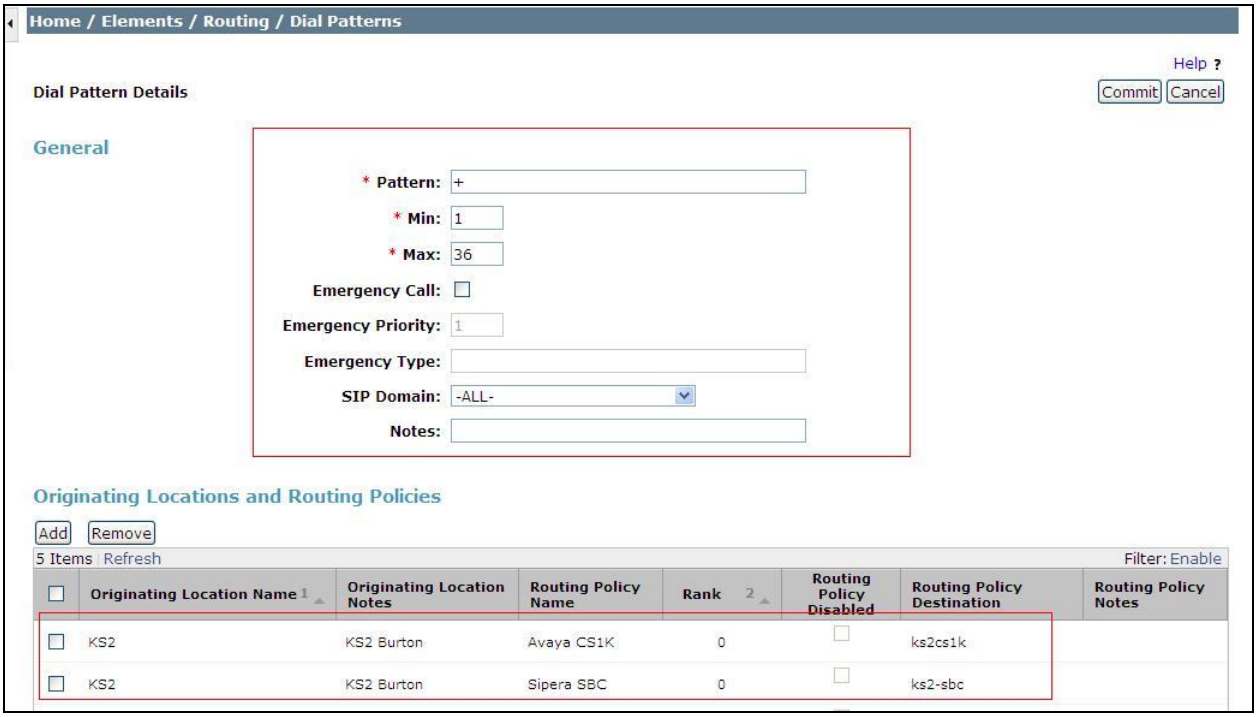
Dial Patterns are needed to route calls through Session Manager. For the compliance test, dial patterns were needed to route calls from CS1000E to Vodafone and vice versa. Dial Patterns define which route policy will be selected for a particular call based on the dialed digits, destination domain and originating location. To add a dial pattern, navigate to **Routing → Dial Patterns** in the left-hand navigation pane and click on the **New** button in the right pane (not shown). Fill in the following, as shown in the screens below. In the **General** section, enter the following values. Use default values for all remaining fields:

- **Pattern:** Enter a dial string that will be matched against the Request-URI of the call
- **Min:** Enter a minimum length used in the match criteria
- **Max:** Enter a maximum length used in the match criteria
- **SIP Domain:** Enter the destination domain used in the match criteria
- **Notes:** Add a brief description (optional)

In the **Originating Locations and Routing Policies** section, click **Add**. From the **Originating Locations and Routing Policy List** that appears (not shown), select the appropriate originating location for use in the match criteria.

- **Originating Locations** Select **ALL**
- **Routing Policies** Select the required Routing Policy defined in **Section 6.7**

An example of a dial pattern used for the compliance test is shown below.



7. Configure Avaya Session Border Controller for Enterprise

This section describes the configuration of the Session Border Controller. The Avaya SBCE is administered using the UC-Sec Control Center.

7.1. Access Avaya Session Border Controller for Enterprise

Access the Session Border Controller using a web browser by entering the URL **https://<ip-address>**, where **<ip-address>** is the management IP address configured at installation. Select the **UC-Sec Control Center**.

Log in with the appropriate credentials. Click **Sign In**.

7.2. Global Profiles

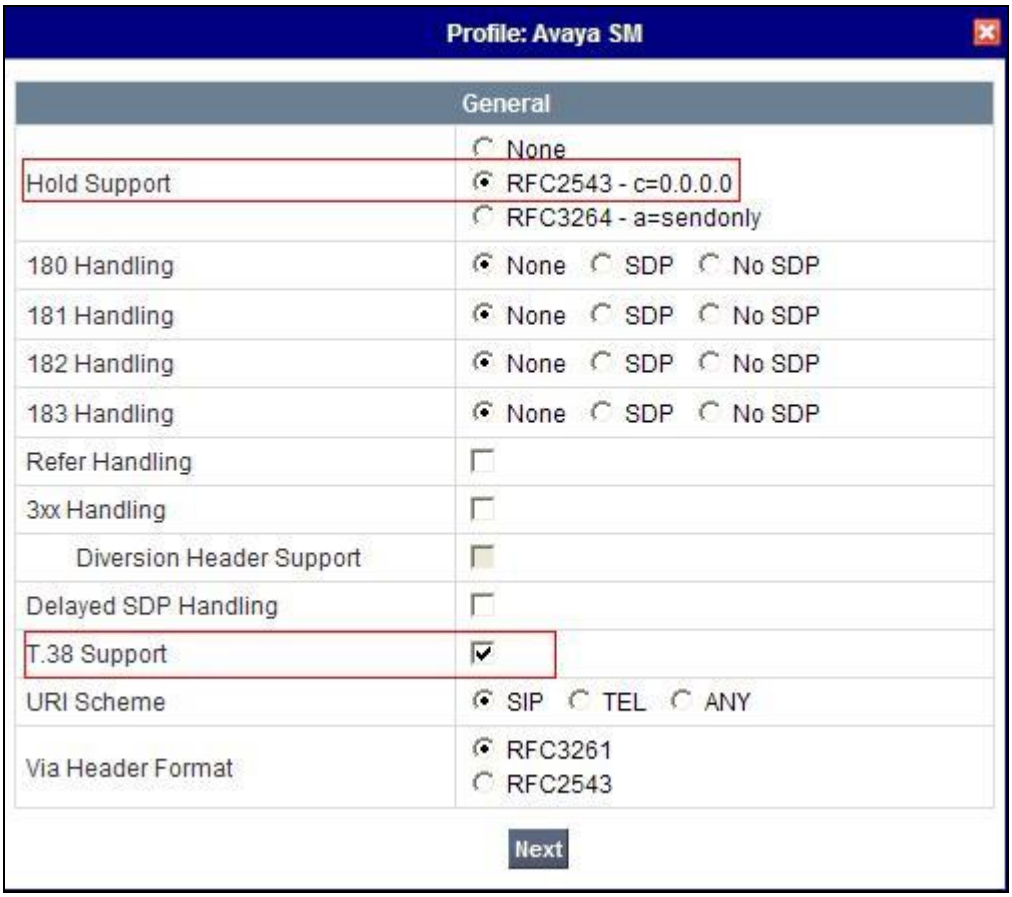
When selected, Global Profiles allows for configuration of parameters across all UC-Sec appliances.

7.2.1. Server Interworking - Avaya Side

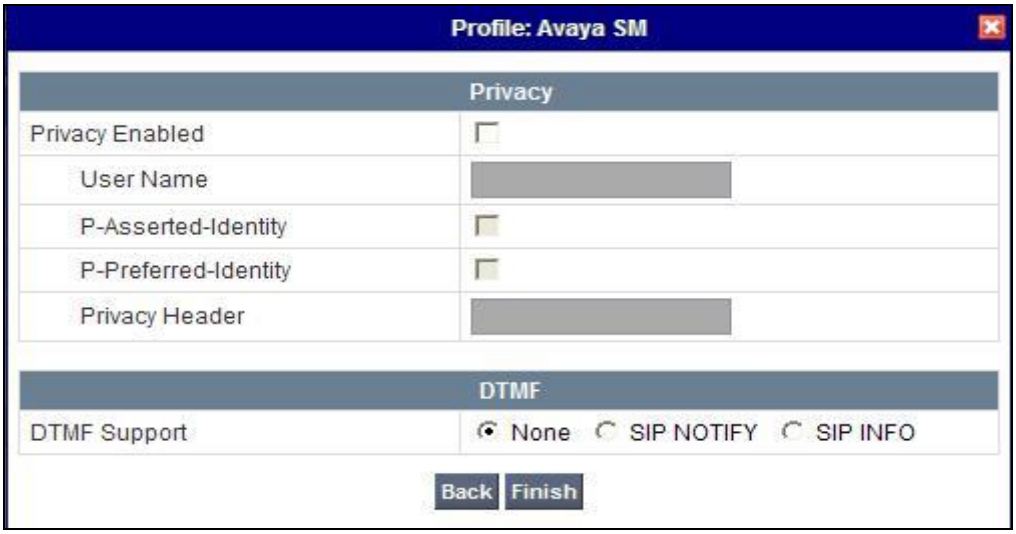
Server Internetworking configures and manages various SIP call server specific capabilities such as call hold and T.38. In this case, the Avaya SBCE is connected as the Trunk Server and the Session Manager is connected as the Call Server.
To define server interworking on the Avaya SBCE, navigate to **Global Profiles → Server Interworking** and click on **Add Profile** (Not Shown).

- Enter profile name such as **Avaya SM** and click **Next** (Not Shown)
- Check **T.38 Support** (not required but checked to avoid restriction on SBC)
- All other options on the **General** Tab can be left at default

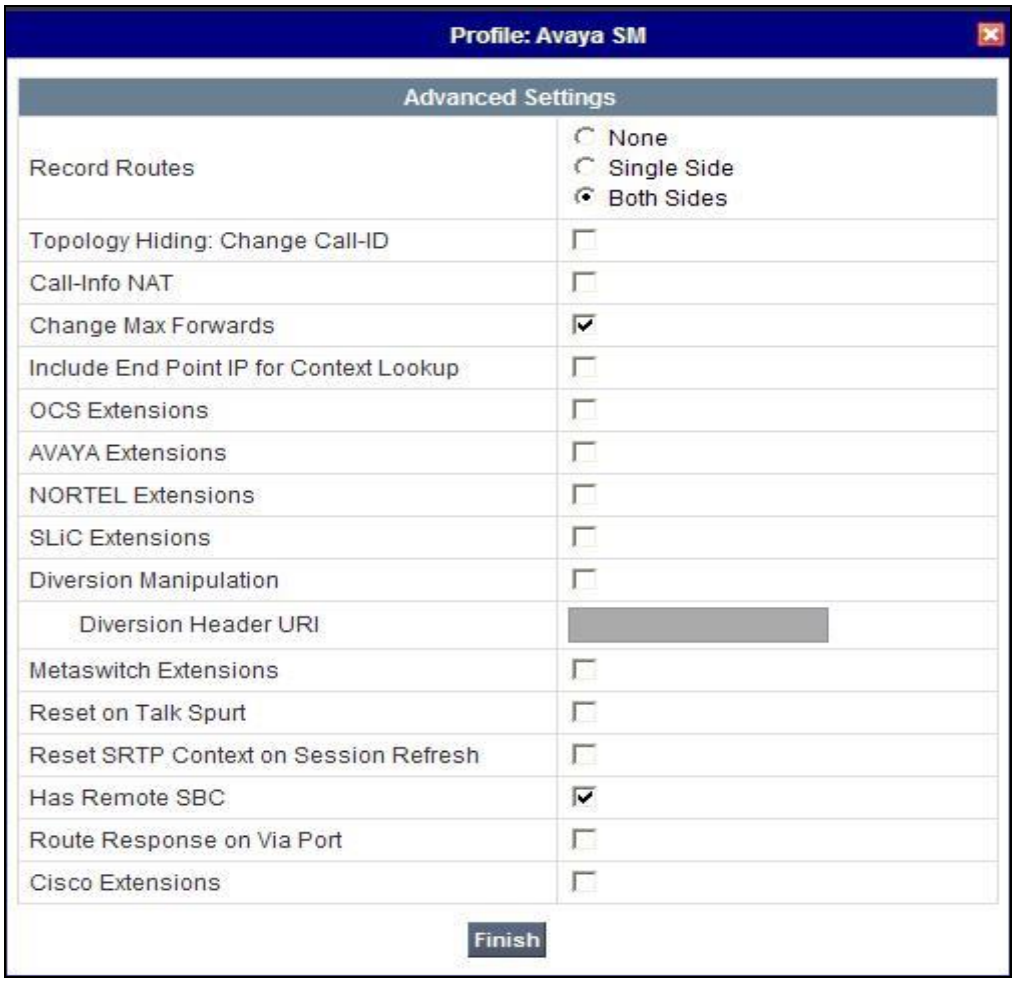
Click **Next** to continue.



Default values can be used for the next window that appears. Click **Finish**.



Default values can be used for the **Advanced Settings** window. Click **Finish**.



7.2.2. Server Interworking – Vodafone Side

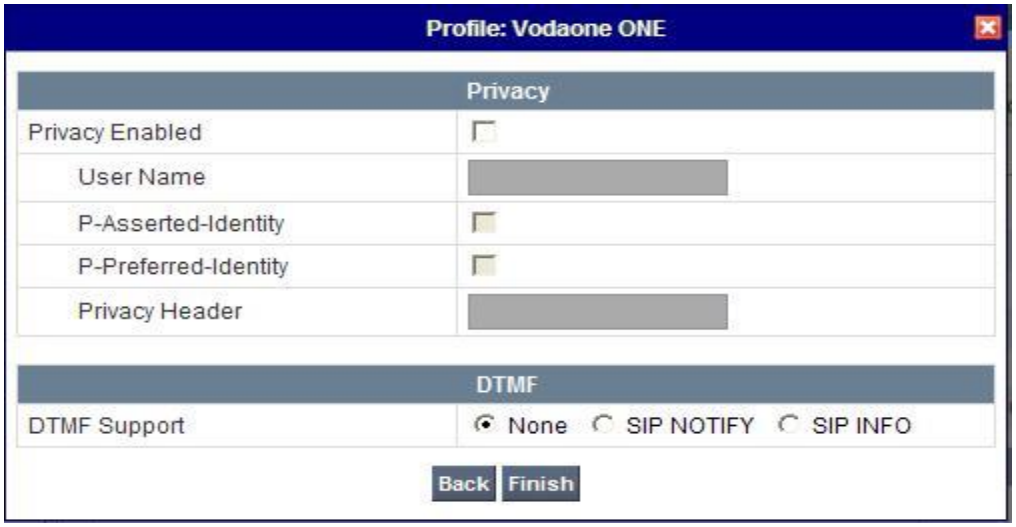
Server Internetworking configures and manages various SIP call server specific capabilities such as call hold and T.38. In this case, the Avaya SBCE is connected as the Trunk Server and the Session Manager is connected as the Call Server.

To define server interworking on the Avaya SBCE, navigate to **Global Profiles → Server Interworking** and click on **Add Profile** (Not Shown).

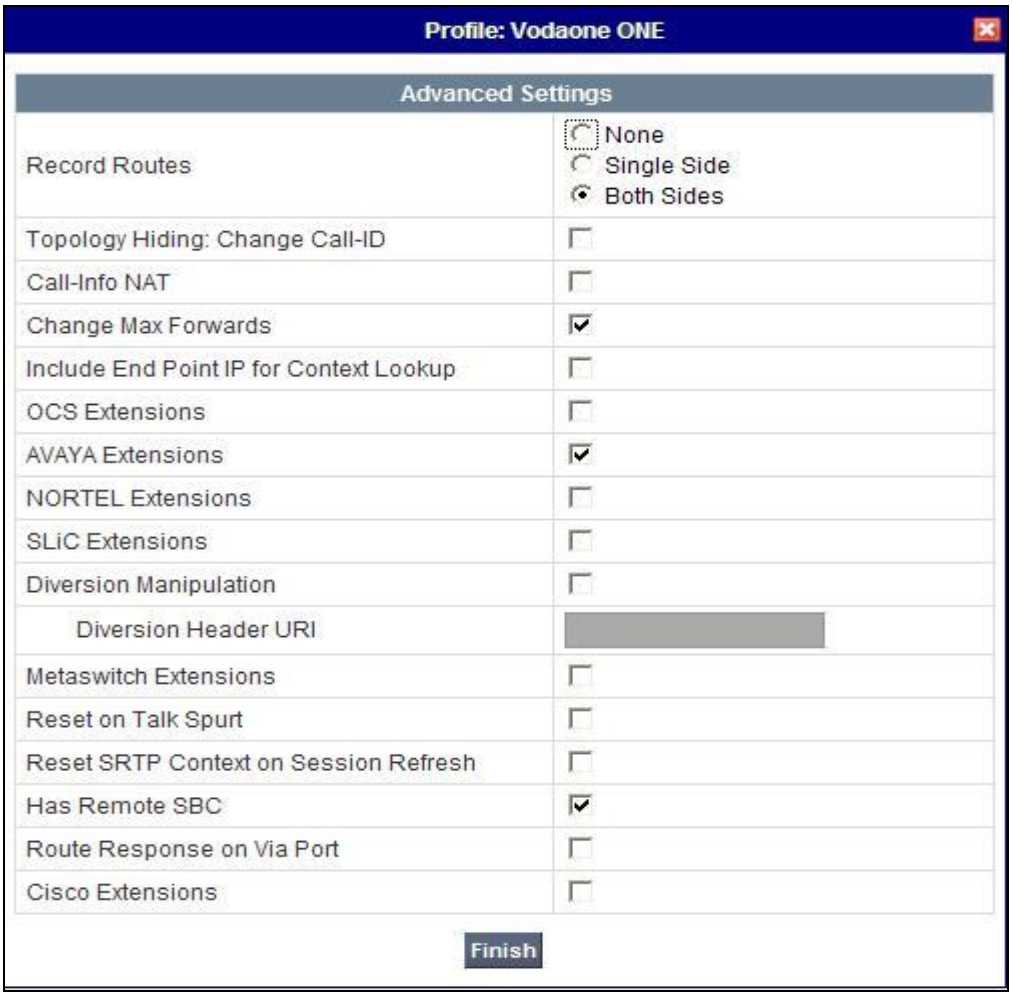
- Enter profile name such as **Vodafone ONE** and click **Next** (Not Shown)
- Check **Hold Support= RFC2543**
- Check **T.38 Support** (not required but checked to avoid restriction on SBC)
- All other options on the **General** Tab can be left at default

Click **Next** to continue.

Default values can be used for the next window that appears. Click **Finish**.



Default values can be used for the **Advanced Settings** window. Click **Finish**.



7.2.3. Routing

Routing profiles define a specific set of packet routing criteria that are used in conjunction with other types of domain policies to identify a particular call flow and thereby ascertain which security features will be applied to those packets. Parameters defined by Routing Profiles include packet transport settings, name server addresses and resolution methods, next hop routing information, and packet transport types.

Routing information is required for routing to the Session Manager on the internal side and the Avaya SBCE on the external side. The IP addresses and ports defined here will be used as the destination addresses for signalling. If no port is specified in the **Next Hop IP Address**, default 5060 is used.

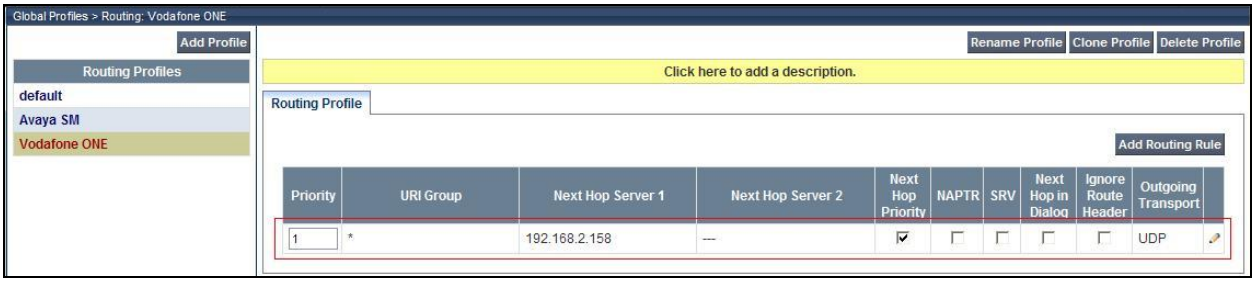
Create a Routing Profile for Session Manager and a Routing Profile for Vodafone FMC Trunk service. To add a routing profile, navigate to **UC-Sec Control Center → Global Profiles → Routing** and select **Add Profile**. Enter a **Profile Name** and click **Next** to continue.
In the new window that appears (not shown), enter the following values. Use default values for all remaining fields:

- **URI Group:** Select "*****" from the drop down box
- **Next Hop Server 1:** Enter the Domain Name or IP address of the Primary Next Hop server
- **Next Hop Server 2:** (Optional) Enter the Domain Name or IP address of the secondary Next Hop server
- **Routing Priority Based on Next Hop Server**: Checked
- **Use Next Hop for In-Dialog Messages**: Select only if there is no secondary Next Hopserver
- **Outgoing Transport:** Choose the protocol used for transporting outgoing signaling packets

Click **Finish** (not shown).

The following screen shows the Routing Profile to Session Manager. The **Next Hop Server 1** IP address must match the IP address of the Session Manager Security Module in **Section 6.5**.

The following screen shows the Routing Profile to Vodafone.



7.2.4. Server - Configuration

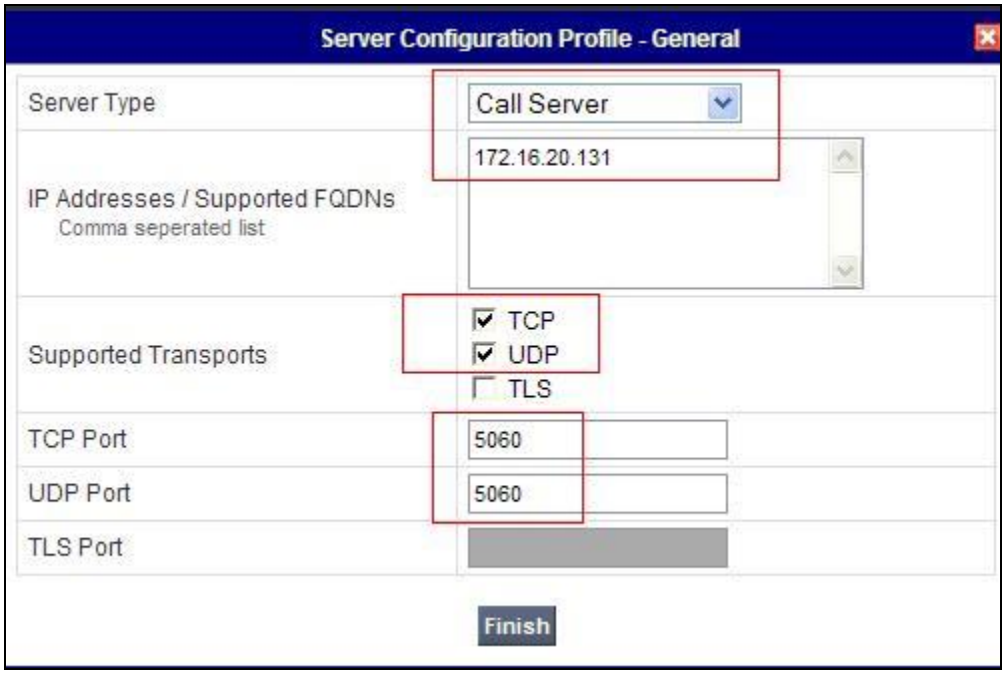
The **Server Configuration** screen contains four tabs: **General**, **Authentication**, **Heartbeat**, and **Advanced**. Together, these tabs configure and manage various SIP call server specific parameters such as TCP and UDP port assignments, IP Server type, heartbeat signaling parameters and some advanced options.

7.2.4.1 Server - Configuration – Avaya Side

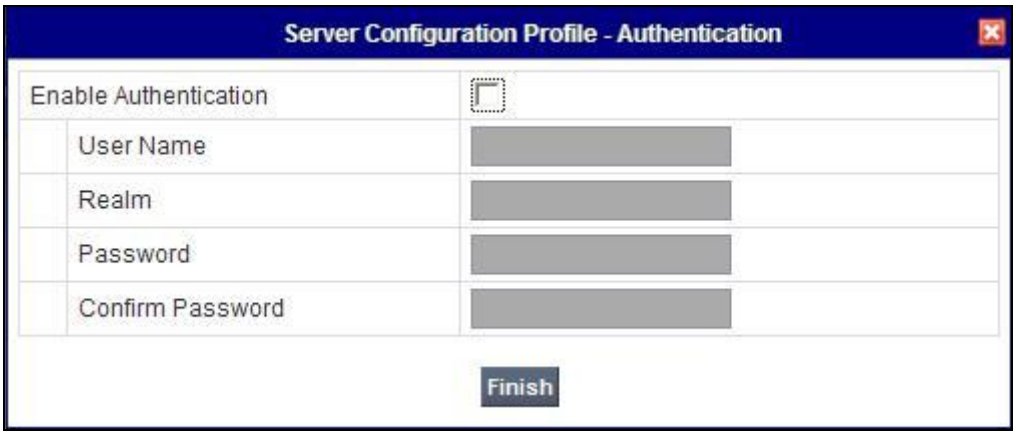
Servers are defined for each server connected to the Avaya SBCE. In this case, the Vodafone SBC is connected as the Trunk Server and the Session Manager is connected as the Call Server To add a Server Configuration Profile for Session Manger, navigate to **UC-Sec Control Center → Global Profiles → Server Configuration** and click on **Add Profile** (not shown). In the new window that appears, enter the following values. Use default values for all remaining fields:

- **Server Type:** Select **Call Server** from the drop-down box
- **IP Addresses / Supported FQDNs:** Enter the IP address of the Session Manager signaling interface. This should match the IP address of the Session Manager Security Module in **Section 6.5**
- **Supported Transports:** Select the transport protocol used to create the Avaya SBCE Entity Link on Session Manager in **Section 6.6**
- **TCP/UDP Port:** Port number on which to send SIP requests to Session Manager. This should match the port number used in the Avaya SBCE Entity Link on Session Manager in **Section 6.6**

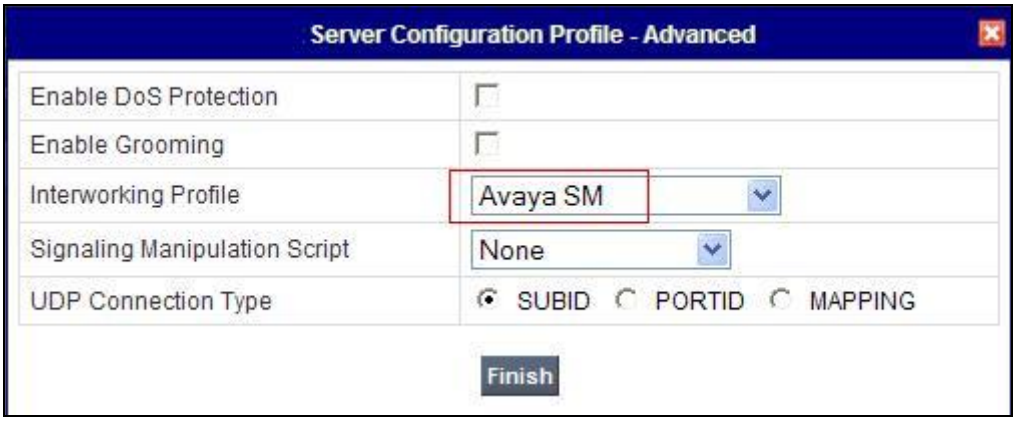
Click **Finish** to continue.



In the new window that appears, verify **Enable Authentication** is unchecked as Session Manager does not require authentication. Click **Finish**.



In the new window that appears, select the **Interworking Profile** created for the enterprise in **Section 7.2.1**. Use default values for all remaining fields. Click **Finish** to save the configuration.

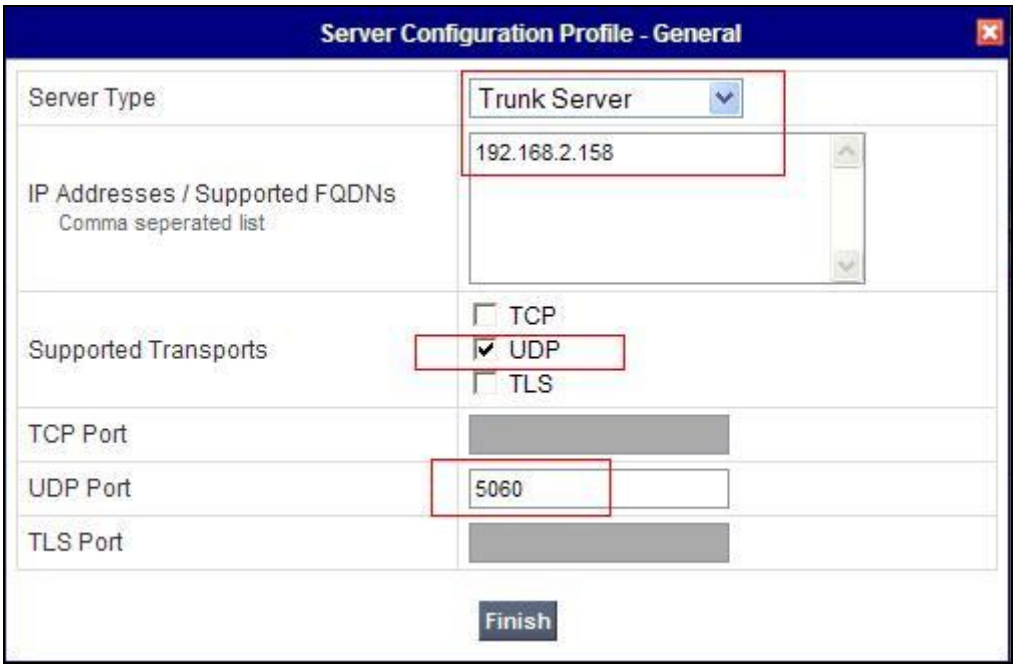


7.2.4.2 Server - Configuration - Vodafone

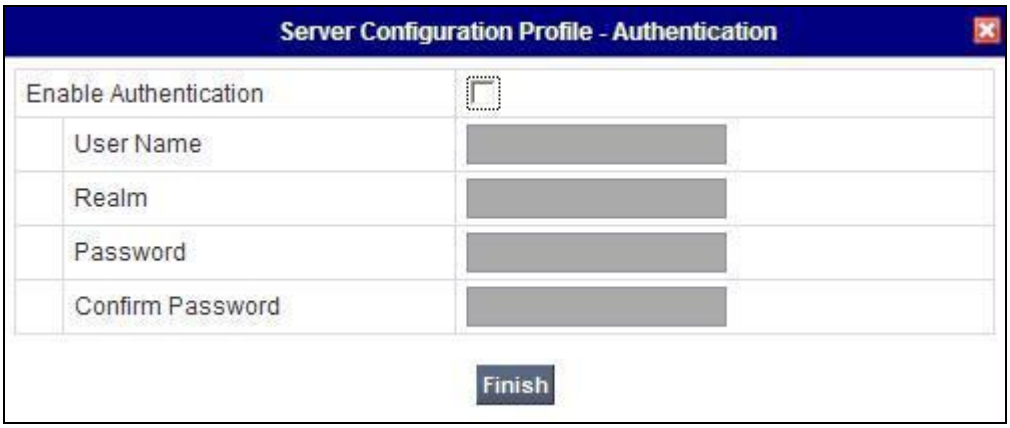
To add a Server Configuration Profile for Vodafone, navigate to **UC-Sec Control Center → Global Profiles → Server Configuration** and click on **Add Profile** (not shown). In the new window that appears, enter the following values. Use default values for all remaining fields:

- **Server Type:** Select **Trunk Server** from the drop-down box
- **IP Addresses / Supported FQDNs:** Enter the IP address(es) of the SIP proxy(ies) of the service provider. This will associate the inbound SIP messages from Vodafone to this Sever Configuration
- **Supported Transports:** Select the transport protocol to be used for SIP traffic between Avaya SBCE and Vodafone
- **UDP Port:** Enter the port number that Vodafone uses to send SIP traffic

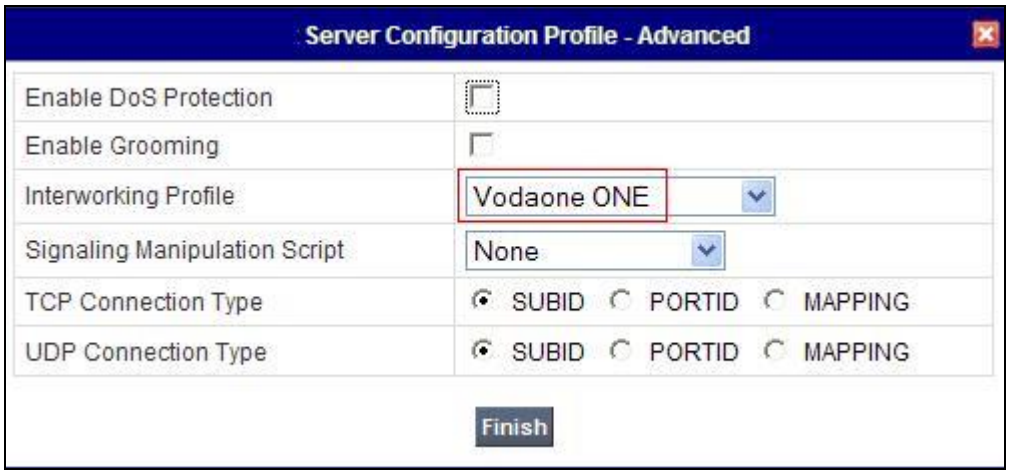
Click **Finish** to continue.



In the new window that appears, verify **Enable Authentication** is unchecked as Vodafone do not require authentication. Click **Finish**.



In the new window that appears, select the **Interworking Profile** created for Vodafone in **Section 7.2.2**. Use default values for all remaining fields. Click **Finish** to save the configuration.



7.2.5. Topology Hiding

Topology hiding is used to hide local information such as private IP addresses and local domain names. The local information can be overwritten with a domain name or IP addresses. The default **Replace Action** is **Auto**, this replaces local information with IP addresses, generally the next hop. Topology hiding has the advantage of presenting single Via and Record-Route headers externally where multiple headers may be received from the enterprise, particularly from the Session Manager. In some cases where Topology Hiding can't be applied, in particular the Contact header, IP addresses are translated to the Avaya SBCE external addresses using NAT.

To define Topology Hiding for the Session Manager, navigate to **Global Profiles → Topology Hiding** in the **UC-Sec Control Center** menu on the left hand side. Click on **Add Profile** and enter details in the **Topology Hiding Profile** pop-up menu (not shown).

- In the **Profile Name** field enter a descriptive name for the Session Manager and click **Next**
- If the **Request-Line**, **Record-Route** and **Via** Headers aren't shown, click on **Add Header** and **s**elect from the **Header** drop down menu
- For both of the above headers, leave the **Replace Action** at the default value of **Auto**
- If the **From** and **To** Headers aren't shown, click on **Add Header** and **s**elect from the **Header** drop down menu
- For each of the above headers, select **IP** from the **Criteria** drop down menu (important for the **From** header so that the "anonymous.invalid" domain name for restricted CLI is not overwritten)
- For each of the headers leave the **Replace Action** at the default value of **Auto**

Header	Criteria	Replace Action	Overwrite Value
To	IP	Auto	---
Via	IP/Domain	Auto	---
SDP	IP/Domain	Auto	---
Record-Route	IP/Domain	Auto	---
From	IP	Auto	---
Request-Line	IP/Domain	Auto	---

Note: The use of **Auto** results in an IP address being inserted in the host portion of the Request-URI as opposed to a domain name. If a domain name is required, the action **Overwrite** must be used where appropriate, and the required domain names entered in the **Overwrite Value** field. Different domain names could be used for the enterprise and the Vodafone network.

To define Topology Hiding for the Vodafone SBC, navigate to **Global Profiles → Topology Hiding** in the **UC-Sec Control Center** menu on the left hand side. Click on **Add Profile** and enter details in the **Topology Hiding Profile** pop-up menu (not shown).

- In the **Profile Name** field enter a descriptive name for the Vodafone SBC and click **Next**
- If the **Request-Line**, **Record-Route and Via** Headers aren't shown, click on **Add Header** and **s**elect from the **Header** drop down menu
- For each of the above headers, leave the **Replace Action** at the default value of **Auto**
- If the **From** and **To** Headers aren't shown, click on **Add Header** and **s**elect from the **Header** drop down menu
- For each of the above headers, select **IP** from the **Criteria** drop down menu (important for the **From** header so that the "anonymous.invalid" domain name for restricted CLI is not overwritten)
- For each of the headers leave the **Replace Action** at the default value of **Auto**

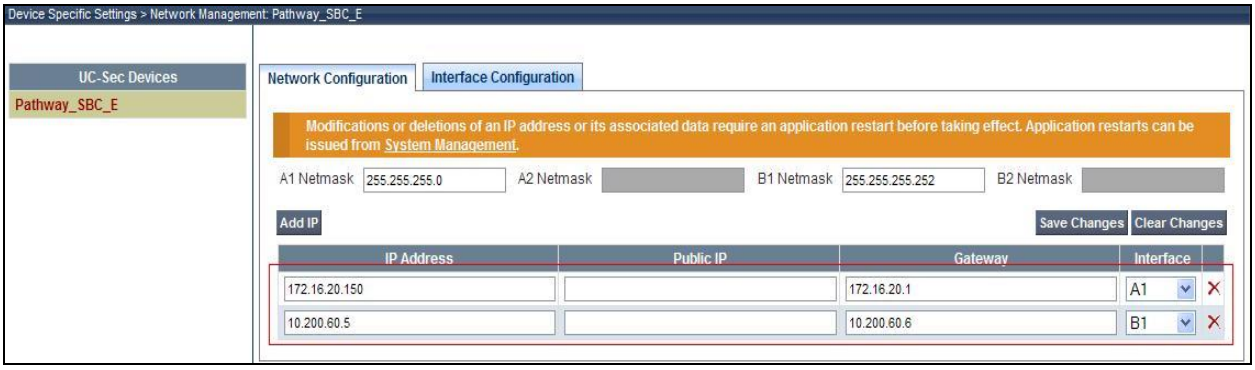
7.3. Device Specific Settings

The Device Specific Settings feature allows aggregation of system information to be viewed, and various device-specific parameters to be managed to determine how a particular device will function when deployed in the network.

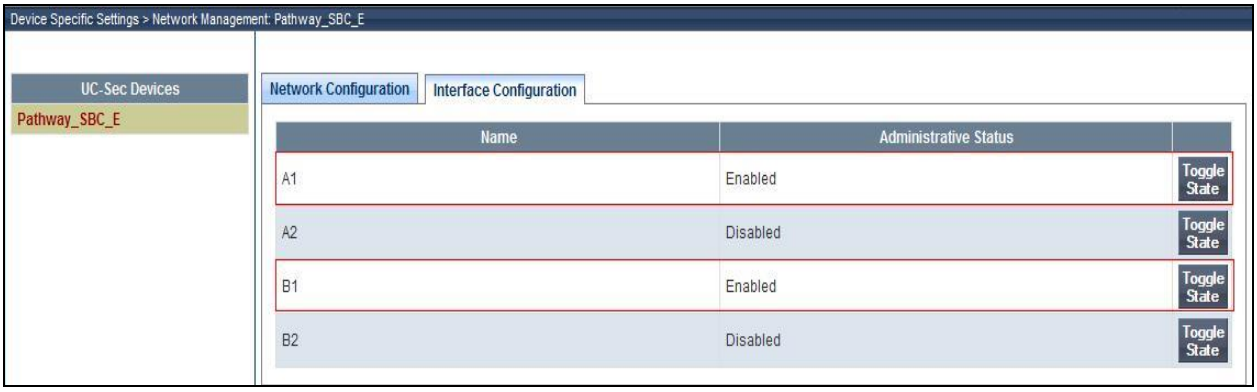
7.3.1. Network Management

The Network Management screen is where the network interface settings are configured and enabled. During the installation process of the Avaya SBCE, certain network-specific information is defined such as device IP address(es), public IP address(es), netmask, gateway, etc. to interface the device to the network. It is this information that populates the various Network Management tab displays, which can be edited as needed to optimize device performance and network efficiency.

Navigate to **UC-Sec Control Center → Device Specific Settings → Network Management** and verify the IP addresses assigned to the interfaces and that the interfaces are enabled. The following screen shows the private interface is assigned to **A1** and the external interface is assigned to **B1.**



Select the **Interface Configuration** Tab and use the **Toggle State** button to enable the interfaces.

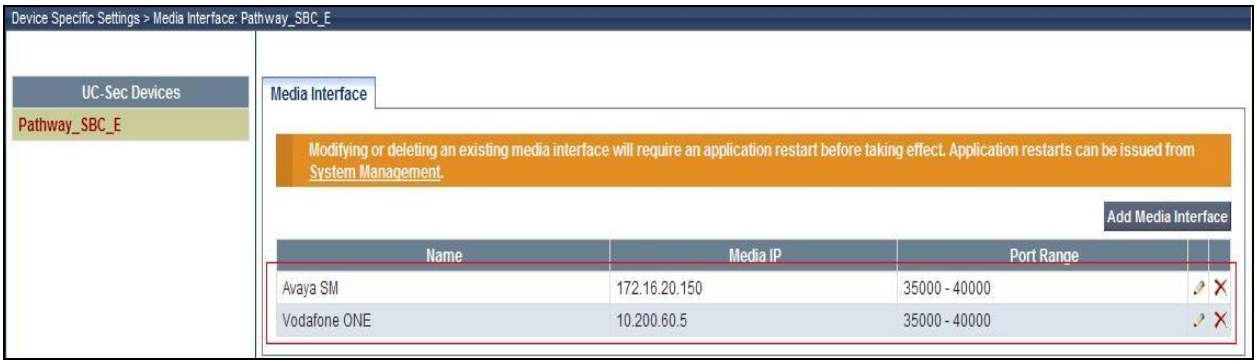


7.3.2. Media Interface

The Media Interface screen allows the IP address and ports to be set for transporting Media over the SIP trunk. The Avaya SBCE listens for SIP media on the defined ports.
To create a new Media Interface, navigate to **UC-Sec Control Center → Device Specific Settings → Media Interface** and click **Add Media Interface**

- Select **Add Media Interface**
- **Name**: **Avaya SM**
- **Media IP**: **172.16.20.150** (Internal address for calls toward CS1000E)
- **Port Range**: **35000-40000**
- Click **Finish**
- Select **Add Media Interface**
- **Name**: **Vodafone ONE**
- **Media IP**: **10.200.60.5** (External address for calls toward Vodafone)
- **Port Range**: **35000-40000**
- Click **Finish**

The following screen shows the Media Interfaces created in the sample configuration for the inside and outside IP interfaces. After the Media Interfaces are created, an application restart is necessary before the changes will take effect.

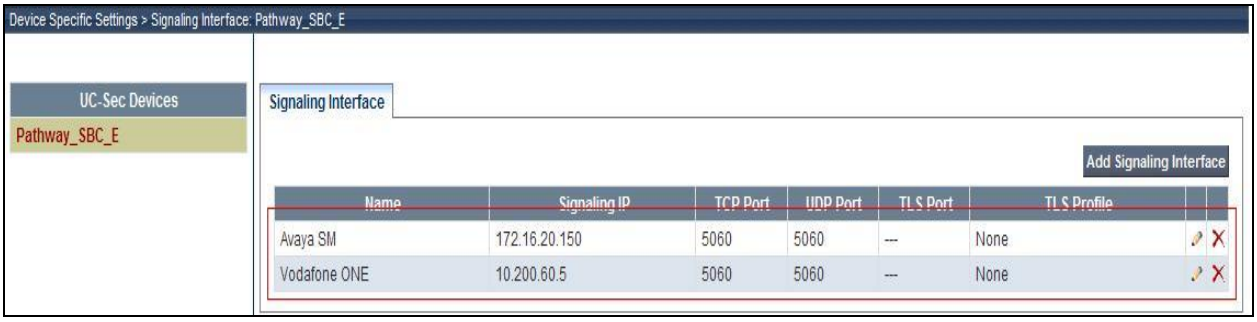


7.3.3. Signalling Interface

The Signalling Interface screen allows the IP Address and ports to be set for transporting signaling messages over the SIP trunk. The Avaya SBCE listens for SIP requests on the defined ports. Create a Signaling Interface for both the inside and outside IP interfaces. To create a new Signaling Interface, navigate to **UC-Sec Control Center → Device Specific Settings → Signaling Interface** and click **Add Signaling Interface**

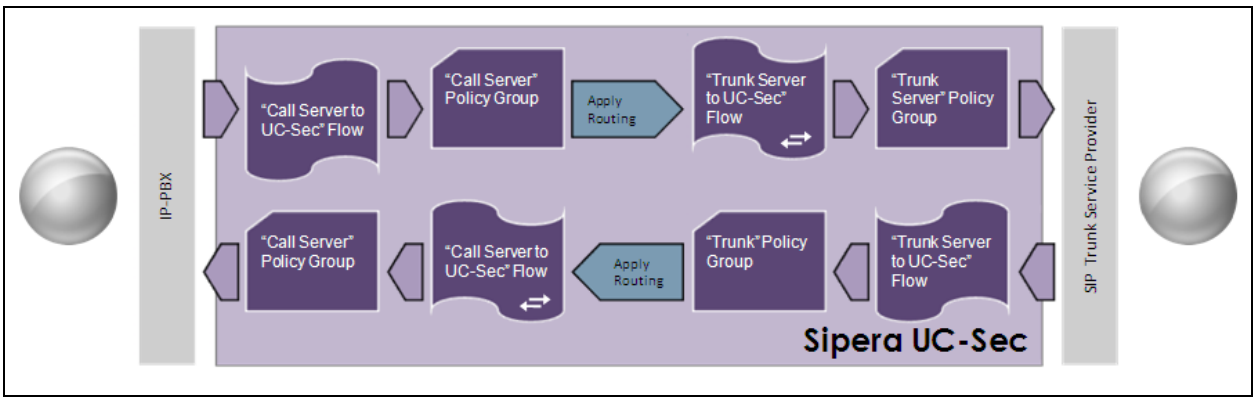
- **Name**: **Avaya SM**
- **Signaling IP**: **172.16.20.150** (Internal address for calls toward CS1000E)
- **TCP Port**: **5060**
- **UDP Port**: **5060**
- Click **Finish**
- Select **Add Signaling Interface**
- **Name**: **Vodafone ONE**
- **Signaling IP: 10.200.60.5** (External address for calls toward Vodafone)
- **TCP Port**: **5060**
- **UDP Port**: **5060**
- Click **Finish**

The following screen shows the signaling interfaces created in the sample configuration for the inside and outside IP interfaces.



7.3.4. End Point Flows

When a packet is received by UC-Sec, the content of the packet (IP addresses, URIs, etc.) is used to determine which flow it matches. Once the flow is determined, the flow points to a policy which contains several rules concerning processing, privileges, authentication, routing, etc. Once routing is applied and the destination endpoint is determined, the policies for this destination endpoint are applied. The context is maintained, so as to be applied to future packets in the same flow. The following screen illustrates the flow through the Avaya SBCE to secure a SIP Trunk call.



To create a Server Flow, navigate to **UC-Sec Control Center → Device Specific Settings → End Point Flows**. Select the **Server Flows** tab and click **Add Flow**.

- **Flow Name:** Enter a descriptive name
- **Server Configuration:** Select a Server Configuration created in **Section 7.2.4** to assign to the Flow
- **Received Interface:** Select the Signaling Interface the Server Configuration is allowed to receive SIP messages from
- **Signaling Interface:** Select the Signaling Interface used to communicate with the Server Configuration
- **Media Interface:** Select the Media Interface used to communicate with the Server Configuration.
- **End Point Policy Group:** Select the policy assigned to the Server Configuration
- **Routing Profile:** Select the profile the Server Configuration will use to route SIP messages to
- **Topology Hiding Profile:** Select the profile to apply toward the Server Configuration

Click **Finish** to save and exit.

The following screen shows the Sever Flow for Session Manager.

Server Configuration: Avaya SM

Priority	Flow Name	URI Group	Transport	Remote Subnet	Received Interface	Signaling Interface	Media Interface	End Point Policy Group	Routing Profile	Topology Hiding Profile	File Transfer Profile			
1	Inbound Flow	*	*	*	Vodafone ONE	Avaya SM	Avaya SM	default-low	Vodafone ONE	Avaya SM	None			

The following screen shows the Sever Flow for Vodafone.

Server Configuration: Vodafone ONE

Priority	Flow Name	URI Group	Transport	Remote Subnet	Received Interface	Signaling Interface	Media Interface	End Point Policy Group	Routing Profile	Topology Hiding Profile	File Transfer Profile			
1	Outbound Flow	*	*	*	Avaya SM	Vodafone ONE	Vodafone ONE	default-low	Avaya SM	Vodafone ONE	None			

8. Vodafone FMC Trunk Service Provider Configuration

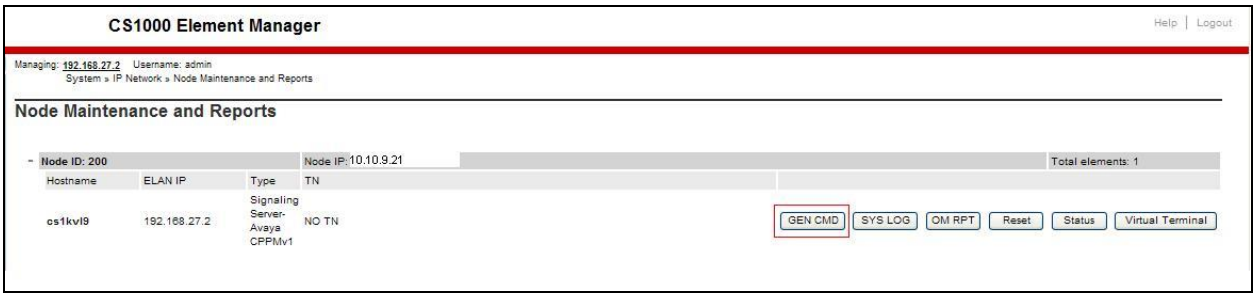
The configuration of the Vodafone equipment used to support the Vodafone FMC Trunk service is outside of the scope of these Application Notes and will not be covered. To obtain further information on Vodafone equipment and system configuration please contact an authorised Vodafone representative.

9. Verification

This section illustrates sample verifications that may be performed using the Avaya CS1000E Element Manager GUI.

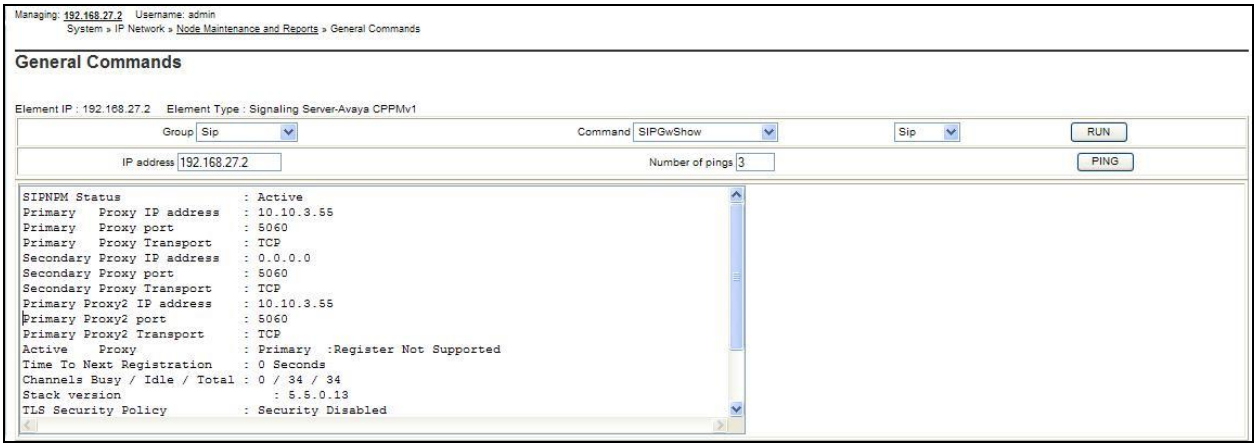
9.1.1. IP Network Maintenance and Reports Commands

From Element Manager, navigate to **System → IP Network → Maintenance and Reports** as shown below. In the resultant screen on the right, click the **Gen CMD** button.

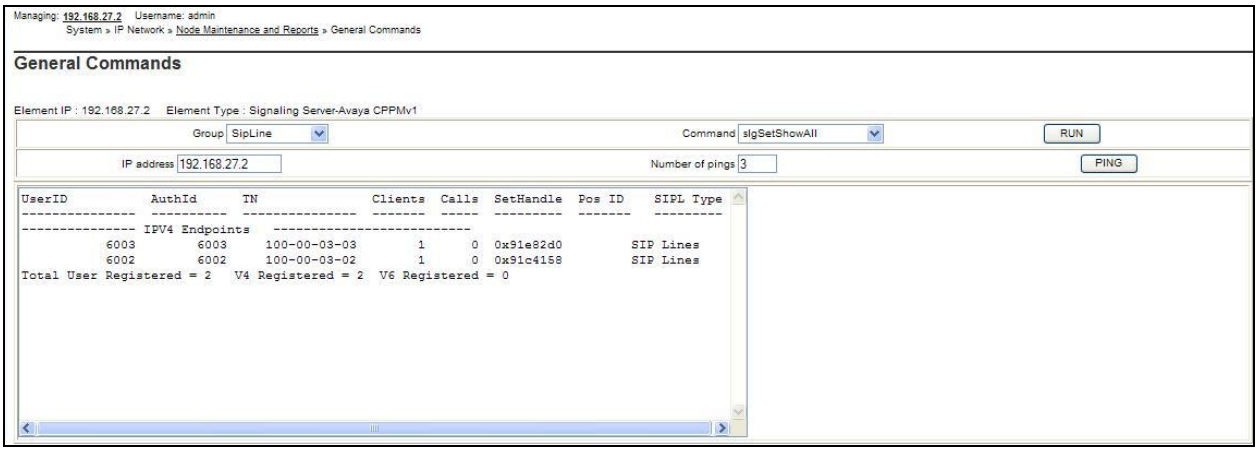


The **General Commands** page is displayed. A variety of commands are available by selecting an appropriate Group and Command from the drop-down menus, and selecting **Run**.

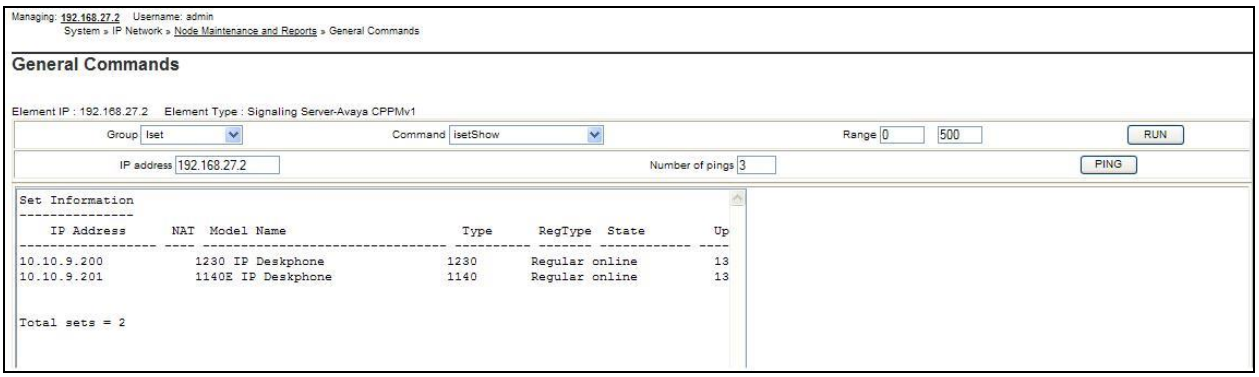
To check the status of the SIP Gateway to Session Manager in the sample configuration, select **Sip** from the Group menu and **SIPGwShow** from the **Command** menu. Click **Run**. The example output below shows that Session Manager (10.10.3.55, port 5060, TCP) has **SIPNPM Status** "**Active**".



The following screen shows a means to view registered SIP telephones. The screen shows the output of the **Command sigSetShowAll** in **Group SipLine**.



The following screen shows a means to view IP UNIStim telephones. The screen shows the output of the **Command isetShow** in **Group Iset**.

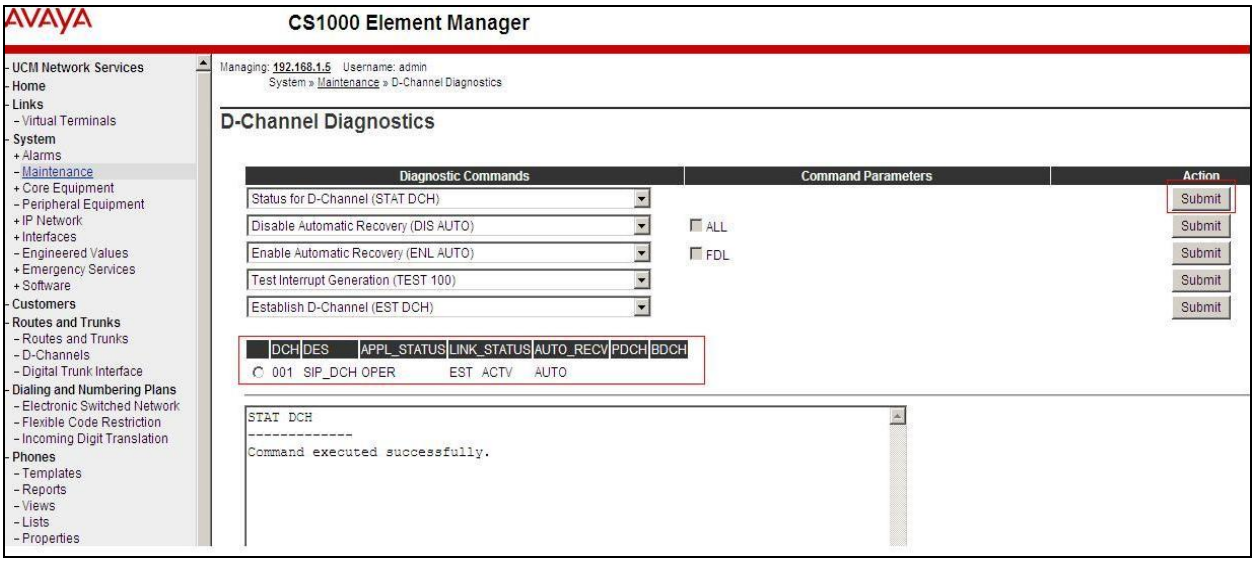


9.2. Verify Avaya Communication Server 1000E Operational Status

Expand **System** on the left navigation panel and select **Maintenance.** Select **LD 96 - D-Channel** from the **Select by Overlay** table and the **D-Channel Diagnostics** function from the **Select by Functionality** table as shown below.

Select **Status for D-Channel (STAT DCH)** command and click **Submit** to verify status of virtual D-Channel as shown below. Verify the status of the following fields.

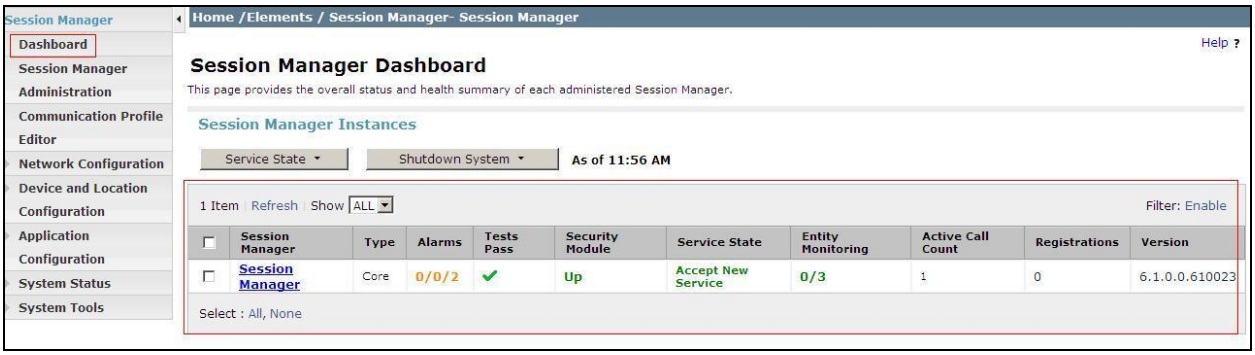
- **APPL_STATUS** Verify status is **OPER**
- **LINK_STATUS** Verify status is **EST ACTV**



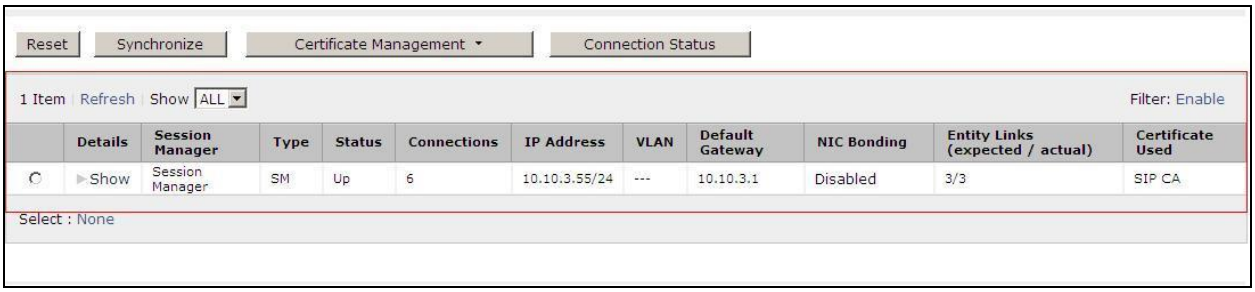
9.3. Verify Avaya Aura® Session Manager Operational Status

9.3.1. Verify Avaya Aura® Session Manager is Operational

Navigate to **Elements → Session Manager → Dashboard** (not shown) to verify the overall system status for Session Manager. Specifically, verify the status of the following fields as shown below.



Navigate to **Elements → Session Manager → System Status → Security Module Status** (not shown) to view more detailed status information on the status of Security Module for the specific Session Manager. Verify the **Status** column displays **Up** as shown below.



10. Conclusion

These Application Notes describe the configuration necessary to connect Avaya Communication Server 1000E, Avaya Aura® Session Manager and Avaya Session Border Controller for Enterprise to Vodafone FMC Trunk Service. Vodafone FMC Trunk Service is a SIP-based Voice over IP solution providing businesses a flexible, cost-saving alternative to traditional hardwired telephony trunks. The service was successfully tested with a number of observations listed in **Section 2.2**.

11. Additional References

This section references the documentation relevant to these Application Notes. Additional Avaya product documentation is available at http://support.avaya.com.

[1] *Implementing Avaya Aura® Session Manager*, Release 6.3, December 2013.
[2] *Installing Service Packs for Avaya Aura® Session Manager*, Release 6.3, December 2013.
[3] *Upgrading Avaya Aura® Session Manager*, Release 6.3, December 2013.
[4] *Maintaining and Troubleshooting Avaya Aura® Session Manager Release 6.3*, December 2013.
[5] *Installing and Configuring Avaya Aura® System Platform Release 6.3*, June 2013
[6] *Implementing Avaya Aura® System Manager Release 6.3*, June 2013
[7] *Upgrading Avaya Aura® System Manager to 6.3.2*, July 2013
[8] *Avaya Communication Server 1000E Installation and Commissioning*, April 2012, Document Number NN43041-310.
[9] *Feature Listing Reference Avaya Communication Server 1000*, November 2010, Document Number NN43001-111, 05.01.
[10] *Linux Platform Base and Applications Installation and Commissioning Avaya Communication Server 1000*, April 2013, Document Number NN43001-315
[11] *Unified Communications Management Common Servers Fundamentals Avaya Communication Server 1000*, February 2013, Document Number NN43001-116
[12] *Software Input Output Reference – Maintenance Avaya Communication Server 1000*, April 2012, Document Number NN43001-711
[13] *Signaling Server IP Line Applications Fundamentals Avaya Communication Server 1000*, October 2011, Document Number NN43001-125
[14] *SIP Software for Avaya 1100 Series IP Deskphones-Administration*, December 2011, Document Number NN43170-600
[15] RFC 3261 SIP: Session Initiation Protocol, http://www.ietf.org/

Appendix A – Avaya Communication Server 1000E Software

Avaya Communication Server 1000E call server patches and plug ins

```
TID: 008809193

VERSION 4021

System type is - Communication Server 1000E/CP PMCP PM - Pentium M 1.4 GHz
IPMGs Registered:               1
IPMGs Unregistered:             0
IPMGs Configured/unregistered:  0


RELEASE 7
ISSUE 50 Q  +
IDLE_SET_DISPLAY Vodafone One
DepList 1: core Issue: 01  ALTERED(created: 2012-05-16 12:51:18 (est))

IN-SERVICE PEPS
CR #            PATCH REF #     NAME      DATE        FILENAME       SPECINS
wi00996889      ISS1:1OF1       p31933_1  10/04/2013  p31933_1.cpm   NO
wi01025511      ISS1:1OF1       p32114_1  10/04/2013  p32114_1.cpm   NO
MDP>LAST SUCCESSFUL MDP REFRESH :2012-05-24 13:36:57(Local Time)
MDP>USING DEPLIST ZIP FILE DOWNLOADED :2012-05-21 11:49:19(est)


LOADWARE VERSION: PSWV 100+

INSTALLED LOADWARE PEPS : 11
PAT#  CR #            PATCH REF #     NAME            DATE        FILENAME
00    wi00839337      ISS1:1OF1       DSP1AB06        24/01/2013  DSP1AB06.LW
01    wi00839337      ISS1:1OF1       DSP2AB06        24/01/2013  DSP2AB06.LW
02    wi00839337      ISS1:1OF1       DSP3AB06        24/01/2013  DSP3AB06.LW
03    wi00839337      ISS1:1OF1       DSP4AB06        24/01/2013  DSP4AB06.LW
04    wi00839337      ISS1:1OF1       DSP5AB06        24/01/2013  DSP5AB06.LW
05                                    mgcfaa19        24/01/2013  MGCFAA19.LD
06    wi00946109      ISS1:1OF1       MGCABA15        24/01/2013  MGCABA15.LW
07    wi00946113      ISS1:1OF1       MGCBBA15        24/01/2013  MGCBBA15.LW
08    Q01820502       ISS1:1OF1       MGCMAB01        24/01/2013  MGCMAB01.LW
09    WI00998702      ISS1:1OF1       MGCCCD03        24/01/2013  MGCCCD03.LW
20    Q01981776       ISS1:1OF1       udtcab14        12/06/2012  udtcab14.lw


ENABLED PLUGINS : 1

PLUGIN    STATUS      PRS/CR_NUM    MPLR_NUM      DESCRIPTION
-------------------------------------------------------------
501       ENABLED     Q02138637     MPLR30070     Enables blind transfer to a SIP endpoint even
if SIP UPDATE is not supported by the far end
```

Avaya Communication Server 1000E call server deplists

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VERSION 4021
RELEASE 7
ISSUE 50 Q +
DepList 1: core Issue: 01 (created: 2012-05-16 12:51:18 (est)) ALTERED

IN-SERVICE PEPS
PAT# CR #            PATCH REF #     NAME      DATE        FILENAME       SPECINS
000  wi00856991      ISS1:1OF1       p17588_1  10/04/2013  p17588_1.cpm   NO
001  wi00950857      ISS1:1OF1       p24307_1  10/04/2013  p24307_1.cpm   NO
002  wi00881777      ISS1:1OF1       p25747_1  10/04/2013  p25747_1.cpm   NO
003  wi00905660      ISS1:1OF1       p27968_1  10/04/2013  p27968_1.cpm   NO
004  WI00839794      ISS1:1OF1       p28647_1  10/04/2013  p28647_1.cpm   NO
005  wi00688381      ISS1:1OF1       p30104_1  10/04/2013  p30104_1.cpm   NO
006  wi00961267      ISS1:1OF1       p30288_1  10/04/2013  p30288_1.cpm   NO
007  wi00896680      ISS1:1OF1       p30357_1  10/04/2013  p30357_1.cpm   NO
008  wi00825488      ISS1:1OF1       p30371_1  10/04/2013  p30371_1.cpm   NO
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009	wi00825486	ISS1:1OF1	p30382_1	10/04/2013	p30382_1.cpm	NO
010	wi00897176	ISS1:1OF1	p30418_1	10/04/2013	p30418_1.cpm	NO
011	wi00903381	ISS1:1OF1	p30421_1	10/04/2013	p30421_1.cpm	NO
012	wi00854130	ISS1:1OF1	p30443_1	10/04/2013	p30443_1.cpm	NO
013	wi00824257	ISS1:1OF1	p30447_1	10/04/2013	p30447_1.cpm	NO
014	wi00836182	ISS1:1OF1	p30450_1	10/04/2013	p30450_1.cpm	NO
015	wi00826075	ISS1:1OF1	p30452_1	10/04/2013	p30452_1.cpm	NO
016	WI00900668	ISS1:1OF1	p30456_1	10/04/2013	p30456_1.cpm	NO
017	wi00854150	ISS1:1OF1	p30468_1	10/04/2013	p30468_1.cpm	NO
018	wi00827950	ISS2:1OF1	p30471_2	10/04/2013	p30471_2.cpm	NO
019	WI00836334	ISS1:1OF1	p30481_1	10/04/2013	p30481_1.cpm	NO
020	wi00877367	ISS1:1OF1	p30534_1	10/04/2013	p30534_1.cpm	NO
021	wi00834382	ISS1:1OF1	p30548_1	10/04/2013	p30548_1.cpm	NO
022	wi00832106	ISS1:1OF1	p30550_1	10/04/2013	p30550_1.cpm	NO
023	WI00836292	ISS1:1OF1	p30554_1	10/04/2013	p30554_1.cpm	NO
024	wi00835294	ISS1:1OF1	p30565_1	10/04/2013	p30565_1.cpm	NO
025	wi00856702	ISS1:1OF1	p30573_1	10/04/2013	p30573_1.cpm	NO
026	wi00838073	ISS1:1OF1	p30588_1	10/04/2013	p30588_1.cpm	NO
027	wi00839255	ISS1:1OF1	p30591_1	10/04/2013	p30591_1.cpm	NO
028	wi00854415	ISS1:1OF1	p30593_1	10/04/2013	p30593_1.cpm	NO
029	wi00841980	ISS1:1OF1	p30618_1	10/04/2013	p30618_1.cpm	NO
030	wi00839821	ISS1:1OF1	p30619_1	10/04/2013	p30619_1.cpm	NO
031	wi00842409	ISS1:1OF1	p30621_1	10/04/2013	p30621_1.cpm	NO
032	WI00853473	ISS1:1OF1	p30625_1	10/04/2013	p30625_1.cpm	NO
033	WI00843571	ISS1:1OF1	p30627_1	10/04/2013	p30627_1.cpm	NO
034	wi00852389	ISS1:1OF1	p30641_1	10/04/2013	p30641_1.cpm	NO
035	wi00859123	ISS1:1OF1	p30648_1	10/04/2013	p30648_1.cpm	NO
036	wi00869695	ISS1:1OF1	p30654_1	10/04/2013	p30654_1.cpm	NO
037	wi00897096	ISS1:1OF1	p30676_1	10/04/2013	p30676_1.cpm	NO
038	wi00859449	ISS1:1OF1	p30694_1	10/04/2013	p30694_1.cpm	NO
039	wi00839134	ISS1:1OF1	p30698_1	10/04/2013	p30698_1.cpm	YES
040	wi00852365	ISS1:1OF1	p30707_1	10/04/2013	p30707_1.cpm	NO
041	wi00850521	ISS1:1OF1	p30709_1	10/04/2013	p30709_1.cpm	YES
042	wi00841273	ISS1:1OF1	p30713_1	10/04/2013	p30713_1.cpm	NO
043	wi00853178	ISS1:1OF1	p30719_1	10/04/2013	p30719_1.cpm	NO
044	wi00843623	ISS1:1OF1	p30731_1	10/04/2013	p30731_1.cpm	YES
045	wi00856410	ISS1:1OF1	p30749_1	10/04/2013	p30749_1.cpm	NO
046	WI00889786	ISS1:1OF1	p30750_1	10/04/2013	p30750_1.cpm	NO
047	wi00857566	ISS1:1OF1	p30766_1	10/04/2013	p30766_1.cpm	NO
048	wi00840590	ISS1:1OF1	p30767_1	10/04/2013	p30767_1.cpm	NO
049	wi00871969	ISS1:1OF1	p30768_1	10/04/2013	p30768_1.cpm	NO
050	wi00857362	ISS1:1OF1	p30782_1	10/04/2013	p30782_1.cpm	NO
051	wi00863876	ISS1:1OF1	p30787_1	10/04/2013	p30787_1.cpm	NO
052	wi00860279	ISS1:1OF1	p30789_1	10/04/2013	p30789_1.cpm	NO
053	wi00859305	ISS1:1OF1	p30792_1	10/04/2013	p30792_1.cpm	NO
054	wi00925141	ISS1:1OF1	p30802_1	10/04/2013	p30802_1.cpm	NO
055	wi00896394	ISS1:1OF1	p30807_1	10/04/2013	p30807_1.cpm	NO
056	wi00899584	ISS1:1OF1	p30809_1	10/04/2013	p30809_1.cpm	NO
057	wi00858335	ISS1:1OF1	p30819_1	10/04/2013	p30819_1.cpm	NO
058	wi00873382	ISS1:1OF1	p30832_1	10/04/2013	p30832_1.cpm	NO
059	wi00932942	ISS1:1OF1	p30843_1	10/04/2013	p30843_1.cpm	NO
060	wi00869243	ISS1:1OF1	p30848_1	10/04/2013	p30848_1.cpm	NO
061	wi00871739	ISS1:1OF1	p30856_1	10/04/2013	p30856_1.cpm	NO
062	wi00896420	ISS1:1OF1	p30867_1	10/04/2013	p30867_1.cpm	NO
063	wi00862574	iss1:1of1	p30870_1	10/04/2013	p30870_1.cpm	NO
064	wi00877592	ISS1:1OF1	p30880_1	10/04/2013	p30880_1.cpm	NO
065	wi00938555	ISS1:1OF1	p30881_1	10/04/2013	p30881_1.cpm	YES
066	wi00865477	ISS1:1OF1	p30892_1	10/04/2013	p30892_1.cpm	YES
067	wi00865477	ISS1:1OF1	p30893_1	10/04/2013	p30893_1.cpm	YES
068	wi00865477	ISS1:1OF1	p30894_1	10/04/2013	p30894_1.cpm	YES
069	wi00865477	ISS1:1OF1	p30896_1	10/04/2013	p30896_1.cpm	YES
070	wi00865477	ISS1:1OF1	p30898_1	10/04/2013	p30898_1.cpm	YES
071	wi00875701	ISS1:1OF1	p30942_1	10/04/2013	p30942_1.cpm	NO
072	wi00875425	ISS1:1OF1	p30943_1	10/04/2013	p30943_1.cpm	NO
073	wi00879322	ISS1:1OF1	p30954_1	10/04/2013	p30954_1.cpm	NO
074	wi00883604	ISS1:1OF1	p30973_1	10/04/2013	p30973_1.cpm	NO
075	wi00882884	ISS1:1OF1	p30975_1	10/04/2013	p30975_1.cpm	NO
076	wi00880836	ISS1:1OF1	p30976_1	10/04/2013	p30976_1.cpm	NO
077	wi00880386	ISS1:1oF1	p30977_1	10/04/2013	p30977_1.cpm	NO
078	wi00925208	ISS1:1OF1	p30986_1	10/04/2013	p30986_1.cpm	NO

079	WI00927300	ISS1:1OF1	p30999 1	10/04/2013	p30999 1.cpm	NO
080	wi00884699	ISS1:1OF1	p31000 1	10/04/2013	p31000 1.cpm	YES
081	wi00953811	ISS1:1OF1	p31002_1	10/04/2013	p31002_1.cpm	NO
082	wi00900096	ISS1:1OF1	p31006_1	10/04/2013	p31006_1.cpm	NO
083	wi00879526	ISS1:1OF1	p31007_1	10/04/2013	p31007_1.cpm	NO
084	wi00886321	ISS1:1OF1	p31009 1	10/04/2013	p31009 1.cpm	NO
085	wi00882293	ISS1:1OF1	p31010_1	10/04/2013	p31010_1.cpm	NO
086	wi00887744	ISS2:1OF1	p31026 2	10/04/2013	p31026 2.cpm	NO
087	wi00889088	ISS1:1OF1	p31036_1	10/04/2013	p31036_1.cpm	NO
089	wi00890036	ISS1:1OF1	p31044_1	10/04/2013	p31044_1.cpm	NO
090	wi00890475	p30952	p31048_1	10/04/2013	p31048_1.cpm	NO
091	wi00891626	ISS1:1OF1	p31051_1	10/04/2013	p31051_1.cpm	YES
092	wi00880221	ISS1:1OF1	p31054_1	10/04/2013	p31054_1.cpm	NO
093	wi00877365	ISS1:1OF1	p31060 1	10/04/2013	p31060 1.cpm	NO
094	wi00924886	ISS1:1OF1	p31062_1	10/04/2013	p31062_1.cpm	YES
095	wi00932948	ISS1:1OF1	p31077_1	10/04/2013	p31077_1.cpm	NO
096	wi00894243	ISS1:1OF1	p31087_1	10/04/2013	p31087_1.cpm	NO
097	wi00893131	ISS1:1OF1	p31089_1	10/04/2013	p31089_1.cpm	NO
098	wi00894443	ISS1:1OF1	p31093 1	10/04/2013	p31093 1.cpm	NO
099	wi00895090	ISS1:1OF1	p31105_1	10/04/2013	p31105_1.cpm	NO
100	wi00895181	ISS1:1OF1	p31106_1	10/04/2013	p31106_1.cpm	NO
101	wi00932958	ISS1:1OF1	p31115_1	10/04/2013	p31115_1.cpm	NO
102	wi00897082	ISS1:1OF1	p31124_1	10/04/2013	p31124_1.cpm	NO
103	wi00898327	ISS1:1OF1	p31136_1	10/04/2013	p31136_1.cpm	NO
104	wi00967510	ISS1:1OF1	p31147 1	10/04/2013	p31147 1.cpm	NO
105	wi00900766	ISS1:1OF1	p31159_1	10/04/2013	p31159_1.cpm	NO
106	wi00868729	ISS1:1OF1	p31163_1	10/04/2013	p31163_1.cpm	NO
107	wi00903369	ISS1:1OF1	p31165_1	10/04/2013	p31165_1.cpm	NO
108	wi00903437	ISS1:1OF1	p31167_1	10/04/2013	p31167_1.cpm	NO
109	wi00905297	ISS1:1OF1	p31195_1	10/04/2013	p31195_1.cpm	NO
110	wi00905600	ISS1:1OF1	p31201 1	10/04/2013	p31201 1.cpm	NO
111	wi00906022	ISS1:1OF1	p31202_1	10/04/2013	p31202_1.cpm	NO
112	wi00906098	ISS1:1OF1	p31203_1	10/04/2013	p31203_1.cpm	YES
113	wi00946282	ISS1:1OF1	p31204_1	10/04/2013	p31204_1.cpm	NO
114	wi00906163	ISS1:1OF1	p31205_1	10/04/2013	p31205_1.cpm	NO
115	wi00906350	ISS1:1OF1	p31219_1	10/04/2013	p31219_1.cpm	NO
116	wi00907403	ISS1:1OF1	p31225 1	10/04/2013	p31225 1.cpm	NO
117	wi00907697	ISS1:1OF1	p31227 1	10/04/2013	p31227 1.cpm	NO
118	wi00907707	ISS1:1OF1	p31228_1	10/04/2013	p31228_1.cpm	NO
119	wi00908598	ISS1:1OF1	p31235_1	10/04/2013	p31235_1.cpm	NO
120	wi00908933	ISS1:1OF1	p31239_1	10/04/2013	p31239_1.cpm	NO
121	wi00949410	ISS1:1OF1	p31248 1	10/04/2013	p31248 1.cpm	NO
122	wi00921295	ISS1:1OF1	p31265_1	10/04/2013	p31265_1.cpm	NO
123	wi00923899	ISS1:1OF1	p31270 1	10/04/2013	p31270 1.cpm	NO
124	wi00898200	ISS1:1of1	p31274_1	10/04/2013	p31274_1.cpm	NO
125	wi00937672	ISS1:1OF1	p31276_1	10/04/2013	p31276_1.cpm	NO
126	wi00929140	ISS1:1OF1	p31284_1	10/04/2013	p31284_1.cpm	NO
127	wi00927321	ISS1:1OF1	p31286 1	10/04/2013	p31286 1.cpm	YES
128	wi00967509	ISS1:1OF1	p31294_1	10/04/2013	p31294_1.cpm	NO
129	WI00928455	ISS1:1OF1	p31297 1	10/04/2013	p31297 1.cpm	NO
130	wi00932204	ISS2:1OF1	p31305_2	10/04/2013	p31305_2.cpm	NO
131	wi00937114	ISS1:1OF1	p31310_1	10/04/2013	p31310_1.cpm	NO
132	wi00925033	ISS1:1OF1	p31320_1	10/04/2013	p31320_1.cpm	NO
133	wi00930864	ISS1:1OF1	p31325 1	10/04/2013	p31325 1.cpm	NO
134	wi00855423	ISS1:1OF1	p31328_1	10/04/2013	p31328_1.cpm	YES
135	wi00909476	ISS1:1OF1	p31340 1	10/04/2013	p31340 1.cpm	NO
136	wi00931028	ISS1:1OF1	p31354_1	10/04/2013	p31354_1.cpm	YES
137	wi00946558	ISS1:1OF1	p31358_1	10/04/2013	p31358_1.cpm	NO
138	wi00936935	ISS1:1OF1	p31362_1	10/04/2013	p31362_1.cpm	NO
139	wi00948274	ISS1:1OF1	p31365 1	10/04/2013	p31365 1.cpm	NO
140	wi00892954	ISS1:1OF1	p31378_1	10/04/2013	p31378_1.cpm	NO
141	wi00936714	ISS1:1OF1	p31379 1	10/04/2013	p31379 1.cpm	NO
142	wi00967512	ISS1:1OF1	p31384_1	10/04/2013	p31384_1.cpm	NO
143	wi00980476	ISS1:1OF1	p31387_1	10/04/2013	p31387_1.cpm	NO
144	wi00932929	ISS1:1OF1	p31392 1	10/04/2013	p31392 1.cpm	YES
145	wi00943172	ISS1:1OF1	p31402_1	10/04/2013	p31402_1.cpm	NO
146	wi00948931	ISS1:1OF1	p31407 1	10/04/2013	p31407 1.cpm	NO
147	wi00942734	ISS1:1OF1	p31409_1	10/04/2013	p31409_1.cpm	NO
148	wi00949273	ISS1:1OF1	p31411_1	10/04/2013	p31411_1.cpm	NO
149	wi00968353	ISS1:1OF1	p31412_1	10/04/2013	p31412_1.cpm	NO

150	wi00946477	ISS1:1OF1	p31426_1	10/04/2013	p31426_1.cpm	NO
151	wi00946876	ISS1:1OF1	p31430_1	10/04/2013	p31430_1.cpm	NO
152	wi00949627	ISS1:1OF1	p31462_1	10/04/2013	p31462_1.cpm	NO
153	wi00965285	ISS1:1OF1	p31476_1	10/04/2013	p31476_1.cpm	NO
154	wi00951427	ISS1:1OF1	p31478_1	10/04/2013	p31478_1.cpm	NO
155	wi00951837	ISS1:1OF1	p31485_1	10/04/2013	p31485_1.cpm	NO
156	wi00956885	ISS1:1OF1	p31489_1	10/04/2013	p31489_1.cpm	NO
157	wi00953900	ISS1:1OF1	p31494_1	10/04/2013	p31494_1.cpm	NO
158	wi00955541	ISS1:1OF1	p31501_1	10/04/2013	p31501_1.cpm	NO
159	wi00943748	ISS1:1OF1	p31516_1	10/04/2013	p31516_1.cpm	NO
160	wi00959463	ISS1:1OF1	p31528_1	10/04/2013	p31528_1.cpm	NO
161	wi00957252	ISS1:1OF1	p31530_1	10/04/2013	p31530_1.cpm	NO
162	wi00959284	ISS1:1OF1	p31531_1	10/04/2013	p31531_1.cpm	NO
163	wi00958776	ISS1:1OF1	p31542_1	10/04/2013	p31542_1.cpm	YES
164	wi00957316	ISS1:1OF1	p31547_1	10/04/2013	p31547_1.cpm	NO
165	wi00959457	ISS1:1OF1	p31551_1	10/04/2013	p31551_1.cpm	NO
166	wi00960133	ISS2:1OF1	p31557_2	10/04/2013	p31557_2.cpm	NO
167	wi00959820	ISS1:1OF1	p31562_1	10/04/2013	p31562_1.cpm	NO
168	wi00960809	ISS1:1OF1	p31564_1	10/04/2013	p31564_1.cpm	NO
169	wi00930649	ISS1:1OF1	p31570_1	10/04/2013	p31570_1.cpm	NO
170	wi00962211	ISS1:1OF1	p31580_1	10/04/2013	p31580_1.cpm	NO
171	wi00962955	ISS1:1OF1	p31585_1	10/04/2013	p31585_1.cpm	NO
172	wi00967205	ISS1:1OF1	p31592_1	10/04/2013	p31592_1.cpm	NO
173	wi00991523	ISS1:1OF1	p31603_1	10/04/2013	p31603_1.cpm	NO
174	wi00965724	ISS1:1OF1	p31606_1	10/04/2013	p31606_1.cpm	NO
175	wi00965838	ISS1:1OF1	p31623_1	10/04/2013	p31623_1.cpm	NO
176	wi00968157	ISS1:1OF1	p31637_1	10/04/2013	p31637_1.cpm	NO
177	wi00956788	ISS1:1OF1	p31638_1	10/04/2013	p31638_1.cpm	NO
178	wi00945997	ISS1:1OF1	p31641_1	10/04/2013	p31641_1.cpm	NO
179	wi00969039	ISS1:1OF1	p31643_1	10/04/2013	p31643_1.cpm	NO
180	wi00968531	ISS1:1OF1	p31645_1	10/04/2013	p31645_1.cpm	NO
181	wi00968448	ISS1:1OF1	p31648_1	10/04/2013	p31648_1.cpm	YES
182	wi00969208	ISS1:1OF1	p31656_1	10/04/2013	p31656_1.cpm	NO
183	wi00969581	ISS1:1OF1	p31661_1	10/04/2013	p31661_1.cpm	YES
184	wi00969890	ISS1:1OF1	p31664_1	10/04/2013	p31664_1.cpm	YES
185	wi00962982	ISS1:1OF1	p31685_1	10/04/2013	p31685_1.cpm	NO
186	wi00974272	ISS1:1OF1	p31690_1	10/04/2013	p31690_1.cpm	YES
187	wi00974635	ISS1:1OF1	p31695_1	10/04/2013	p31695_1.cpm	YES
188	wi00975150	ISS1:1OF1	p31703_1	10/04/2013	p31703_1.cpm	NO
189	wi00975659	ISS1:1OF1	p31707_1	10/04/2013	p31707_1.cpm	NO
190	wi00973241	ISS1:1OF1	p31715_1	10/04/2013	p31715_1.cpm	NO
191	wi00976209	ISS1:1OF1	p31717_1	10/04/2013	p31717_1.cpm	YES
192	wi00950575	ISS1:1OF1	p31724_1	10/04/2013	p31724_1.cpm	NO
193	wi00975133	ISS1:1OF1	p31731_1	10/04/2013	p31731_1.cpm	NO
194	wi00955753	ISS1:1OF1	p31733_1	10/04/2013	p31733_1.cpm	NO
195	wi00977393	ISS1:1OF1	p31744_1	10/04/2013	p31744_1.cpm	YES
196	wi00979591	ISS1:1OF1	p31746_1	10/04/2013	p31746_1.cpm	NO
197	wi00979414	ISS1:1OF1	p31748_1	10/04/2013	p31748_1.cpm	YES
198	wi00971209	ISS1:1OF1	p31750_1	10/04/2013	p31750_1.cpm	NO
199	wi00973270	ISS1:1OF1	p31751_1	10/04/2013	p31751_1.cpm	NO
200	wi00980531	ISS1:1OF1	p31755_1	10/04/2013	p31755_1.cpm	NO
201	wi00983505	ISS1:1OF1	p31758_1	10/04/2013	p31758_1.cpm	NO
202	wi00978064	ISS1:1OF1	p31760_1	10/04/2013	p31760_1.cpm	NO
203	wi00981711	ISS1:1OF1	p31766_1	10/04/2013	p31766_1.cpm	NO
204	wi00978883	ISS1:1OF1	p31770_1	10/04/2013	p31770_1.cpm	NO
205	wi00982566	ISS1:1OF1	p31774_1	10/04/2013	p31774_1.cpm	NO
206	wi00983007	ISS1:1OF1	p31778_1	10/04/2013	p31778_1.cpm	YES
207	wi00996630	ISS1:1OF1	p31789_1	10/04/2013	p31789_1.cpm	NO
208	wi00984652	ISS1:1OF1	p31792_1	10/04/2013	p31792_1.cpm	NO
209	wi00971029	ISS1:1OF1	p31794_1	10/04/2013	p31794_1.cpm	NO
210	wi00984888	ISS1:1OF1	p31795_1	10/04/2013	p31795_1.cpm	NO
211	wi00982243	ISS1:1OF1	p31797_1	10/04/2013	p31797_1.cpm	YES
212	wi00957235	ISS1:1OF1	p31798_1	10/04/2013	p31798_1.cpm	NO
213	wi00986337	ISS1:1OF1	p31803_1	10/04/2013	p31803_1.cpm	NO
214	wi00987089	ISS1:1OF1	p31809_1	10/04/2013	p31809_1.cpm	NO
215	wi00987424	ISS1:1OF1	p31815_1	10/04/2013	p31815_1.cpm	NO
216	wi00982851	ISS1:1OF1	p31822_1	10/04/2013	p31822_1.cpm	NO
217	wi00974856	ISS1:1OF1	p31823_1	10/04/2013	p31823_1.cpm	NO
218	wi00988285	ISS1:1OF1	p31824_1	10/04/2013	p31824_1.cpm	NO
219	wi00990993	ISS1:1OF1	p31825_1	10/04/2013	p31825_1.cpm	NO

```
220  WI00977978      ISS1:1OF1       p31831_1  10/04/2013  p31831_1.cpm   NO
221  wi00977436      ISS1:1OF1       p31834_1  10/04/2013  p31834_1.cpm   NO
222  wi00989828      ISS1:1OF1       p31836_1  10/04/2013  p31836_1.cpm   NO
223  wi00991892      ISS1:1OF1       p31853_1  10/04/2013  p31853_1.cpm   NO
224  wi00985153      ISS1:1OF1       p31859_1  10/04/2013  p31859_1.cpm   NO
225  wi00993377      ISS1:1OF1       p31860_1  10/04/2013  p31860_1.cpm   NO
226  wi00993648      ISS1:1OF1       p31867_1  10/04/2013  p31867_1.cpm   NO
227  wi00981928      ISS1:1OF1       p31869_1  10/04/2013  p31869_1.cpm   NO
228  wi00994044      ISS1:1OF1       p31871_1  10/04/2013  p31871_1.cpm   NO
229  wi00944019      ISS1:1OF1       p31874_1  10/04/2013  p31874_1.cpm   NO
230  wi00992921      ISS1:1OF1       p31878_1  10/04/2013  p31878_1.cpm   NO
231  wi00992974      ISS1:1OF1       p31889_1  10/04/2013  p31889_1.cpm   NO
232  wi00998121      ISS1:1OF1       p31897_1  10/04/2013  p31897_1.cpm   NO
233  wi00997559      ISS1:1OF1       p31898_1  10/04/2013  p31898_1.cpm   NO
234  wi00985760      ISS1:1OF1       p31913_1  10/04/2013  p31913_1.cpm   NO
235  wi01003999      ISS1:1OF1       p31946_1  10/04/2013  p31946_1.cpm   YES
237  wi00996889      ISS1:1OF1       p31933_1  10/04/2013  p31933_1.cpm   NO
238  wi01025511      ISS1:1OF1       p32114_1  10/04/2013  p32114_1.cpm   NO
MDP>LAST SUCCESSFUL MDP REFRESH :2012-05-24 13:36:57(Local Time)
MDP>USING DEPLIST ZIP FILE DOWNLOADED :2012-05-21 11:49:19(est)
```

Avaya Communication Server 1000E signaling server service updates

```
In System service updates: 33
PATCH#  IN_SERVICE   DATE       SPECINS   REMOVABLE   NAME
3       Yes          20/01/12   NO        YES         cs1000-dbcom-7.50.17-02.i386.000
4       Yes          18/12/12   NO        yes         tzdata-2011h-2.el5.i386.000
5       Yes          20/01/12   NO        YES         cs1000-shared-pbx-7.50.17.16-1.i386.000
6       Yes          20/01/12   NO        YES         cs1000-kcv-7.50.17.16-1.i386.000
7       Yes          20/01/12   NO        YES         cs1000-nrsmWebService-7.50.17.16-1.i386.000
9       Yes          02/10/12   YES       YES         cs1000-baseWeb-7.50.17.16-2.i386.000
10      Yes          20/01/12   NO        YES         cs1000-ipsec-7.50.17.16-1.i386.000
11      Yes          02/10/12   NO        yes         avaya-cs1000-cnd-4.0.20-00.i386.000
12      Yes          02/10/12   NO        YES         cs1000-pd-7.50.17.16-1.i386.000
13      Yes          02/10/12   NO        YES         cs1000-ncs-7.50.17.16-1.i386.000
14      Yes          20/01/12   NO        YES         ipsec-tools-0.6.5-14.el5.3 avaya 1.i386.000
15      Yes          20/01/12   NO        YES         spiritAgent-6.1-1.0.0.108.208.i386.000
16      No           18/12/12   NO        YES         cs1000-tps-7.50.17.16-24.i386.000
17      Yes          02/10/12   NO        YES         cs1000-EmCentralLogic-7.50.17.16-2.i386.000
20      Yes          02/10/12   NO        YES         cs1000-cs1000WebService 6-0-7.50.17.16-
1.i386.000
21      Yes          02/10/12   NO        YES         cs1000-mscMusc-7.50.17.16-11.i386.000
22      Yes          02/10/12   NO        YES         cs1000-mscAnnc-7.50.17.16-10.i386.000
23      No           18/12/12   NO        YES         cs1000-sps-7.50.17.16-10.i386.000
24      Yes          27/03/12   NO        YES         cs1000-mscTone-7.50.17.16-1.i386.000
25      No           18/12/12   NO        YES         cs1000-ftrpkg-7.50.17.16-11.i386.000
26      Yes          18/12/12   NO        YES         cs1000-dmWeb-7.50.17.16-6.i386.000
27      Yes          02/10/12   NO        YES         cs1000-csoneksvrmgr-7.50.17.16-1.i386.000
28      No           18/12/12   NO        YES         cs1000-dbcom-7.50.17.16-1.i386.000
29      No           18/12/12   NO        YES         cs1000-vtrk-7.50.17.16-131.i386.001
30      Yes          27/03/12   NO        YES         cs1000-sps-7.50.17.16-4.i386.000
31      Yes          18/12/12   NO        YES         cs1000-linuxbase-7.50.17.16-13.i386.000
32      Yes          18/12/12   NO        YES         cs1000-mscAttn-7.50.17.16-3.i386.000
35      Yes          02/10/12   YES       YES         cs1000-nrsm-7.50.17.16-4.i386.000
36      Yes          02/10/12   NO        YES         cs1000-csmWeb-7.50.17.16-6.i386.000
37      Yes          02/10/12   NO        YES         cs1000-mscConf-7.50.17.16-1.i386.000
38      Yes          02/10/12   NO        YES         cs1000-emWeb 6-0-7.50.17.16-34.i386.000
40      Yes          02/10/12   NO        YES         cs1000-Jboss-Quantum-7.50.17.16-30.i386.000
42      Yes          02/10/12   NO        YES         cs1000-emWebLocal 6-0-7.50.17.16-3.i386.000
```

Avaya Communication Server 1000E system software

```
Product Release: 7.50.17.00
Base Applications
   base                          7.50.17     [patched]
   NTAFS                         7.50.17
   sm                            7.50.17
```

```
   cs1000-Auth                  7.50.17
   Jboss-Quantum                7.50.17     [patched]
   cnd                          n/a         [patched]
   lhmonitor                    7.50.17
   baseAppUtils                 7.50.17     [patched]
   dfoTools                     7.50.17
   nnnm                         7.50.17
   cppmUtil                     7.50.17
   oam-logging                  7.50.17     [patched]
   dmWeb                        n/a         [patched]
   baseWeb                      n/a         [patched]
   ipsec                        n/a         [patched]
   Snmp-Daemon-TrapLib          7.50.17     [patched]
   ISECSH                       7.50.17
   patchWeb                     n/a         [patched]
   EmCentralLogic               n/a         [patched]
Application configuration: SS_EM
Packages:
SS
EM
Configuration version:     7.50.17-00
   dbcom                        7.50.17.16  [patched]
   cslogin                      7.50.17
   sigServerShare               7.50.17     [patched]
   csv                          7.50.17
   tps                          7.50.17.16  [patched]
   vtrk                         7.50.17.16  [patched]
   pd                           7.50.17.16  [patched]
   sps                          7.50.17.16  [patched]
   ncs                          7.50.17.16  [patched]
   gk                           7.50.17
   EmConfig                     7.50.17
   emWeb_6-0                    7.50.17     [patched]
   emWebLocal_6-0               7.50.17     [patched]
   csmWeb                       7.50.17     [patched]
   bcc                          7.50.17     [patched]
   ftrpkg                       7.50.17     [patched]
   cs1000WebService 6-0         7.50.17     [patched]
   managedElementWebService     7.50.17
   mscAnnc                      7.50.17.16  [patched]
   mscAttn                      7.50.17.16  [patched]
   mscConf                      7.50.17.16  [patched]
   mscMusc                      7.50.17.16  [patched]
   mscTone                      7.50.17.16  [patched]
```

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at devconnect@avaya.com.