SIP Trunking Configuration Guide

for

Avaya Aura™ Session Manager v5.2 SP2 and Nortel CS1K v6.0

Document Version 1.1

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1 Audience

This document is intended for the SIP Trunk customer's technical staff and Avaya Value Added Retailer (VAR) having installation and operational responsibilities.

2 Introduction

This Configuration Guide describes configuration steps for Cox SIP Trunking to an Avaya/Nortel CS1000 PBX v6.0 with Avaya Aura Session Manager v5.2 SP2. Cox SIP Trunking is a scalable and efficient IP trunking telecommunication solution for your business that provides all the traditional services such as Direct Inward Dialing, Hunting, Calling Name, Calling Number, Local/Long Distance and Cox network-based Business Continuity options, including:

- Burstable Trunk Capacity – Dynamically increases call capacity during peak busy periods so your customers never receive a busy signal.
- Call Forward Always – On the trunk group pilot number for all calls in case of an outage (flood, fire, power outage, etc.).
- Call Forward Not Reachable – On the trunk group pilot number that operates on a per-call contingency basis to forward the call to any PSTN number (e.g. call center or alternate office location) during temporary call completion impairments.
- Route Exhaustion – automatic reroute of trunk group calls to any PSTN phone number (i.e., a call center) if calls can't be completed to the PBX.
- Support for geo-redundant PBX deployments and automatic reroute of SIP Trunks to the backup customer data center.

All calls are routed over Cox's national fiber network with guaranteed Quality of Service (QoS); calls never traverse the Internet.

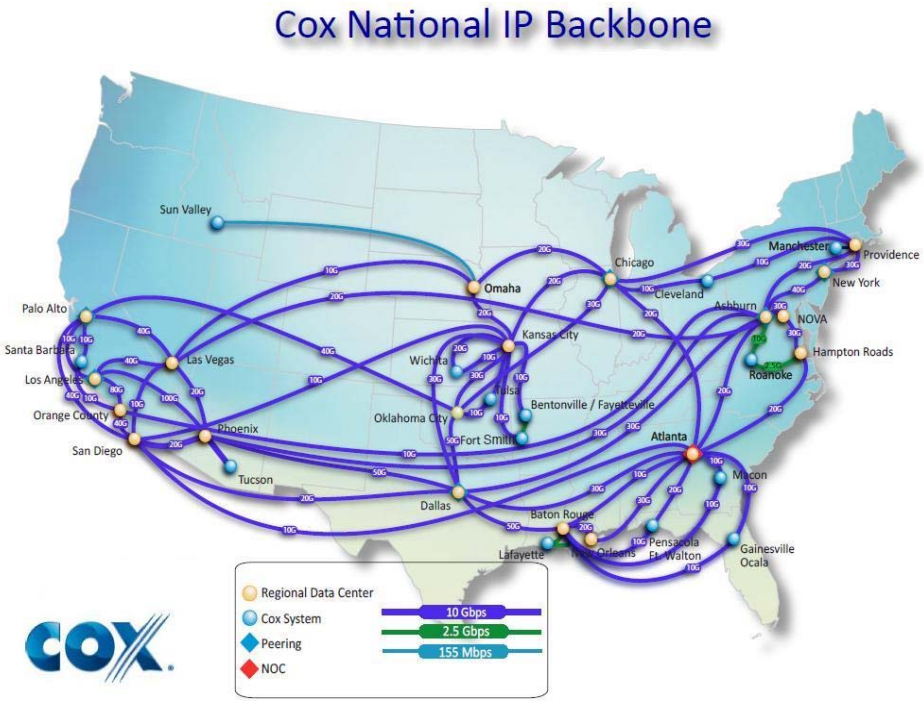


Figure 1 – Cox Fiber Network

3 Network Topology

The high level Cox SIP Trunk network architecture is depicted below. The key network elements are:

- IP PBX – Customer PBX for terminating SIP Trunks.
- Cox Enterprise Session Border Controller (E-SBC) – The E-SBC is a smart service demarcation device and SIP Application Layer Gateway (ALG) installed and managed by Cox.
- High Availability and Geo-Redundant Session Border Controllers (SBC) and Broadsoft SIP Call Servers for survivability and reliability.
- PSTN Gateway for connections to the Public Switched Telephone Network (PSTN).

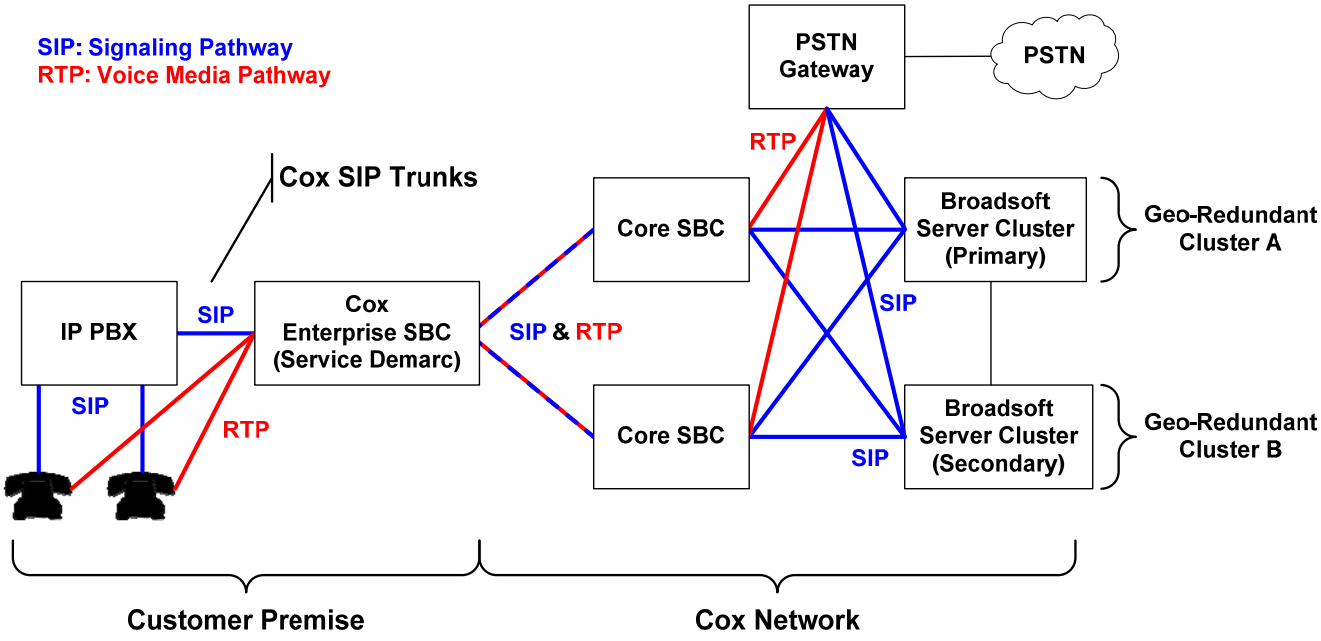


Figure 2 – Reference Network Architecture

This SIP Trunk network architecture is replicated across the Cox operating regions for scalability and operational autonomy.

Cox will deploy one or more Enterprise Session Border Controllers (E-SBCs) to meet call capacity, customer data center geo-redundancy and trunk group requirements. The E-SBC is owned and managed by Cox and is the service demarcation point. The E-SBC performs SIP ALG, SIP normalization, NAT, security, traffic shaping/prioritization, performance reporting and remote diagnostic functions.

4 Lab Network Configuration

The lab network for the SIP Trunk reference configuration is illustrated in **Figure 3** and is representative of an Avaya Aura Session Manager geo-redundant deployment with the CS-1000 (CS1K) PBX.

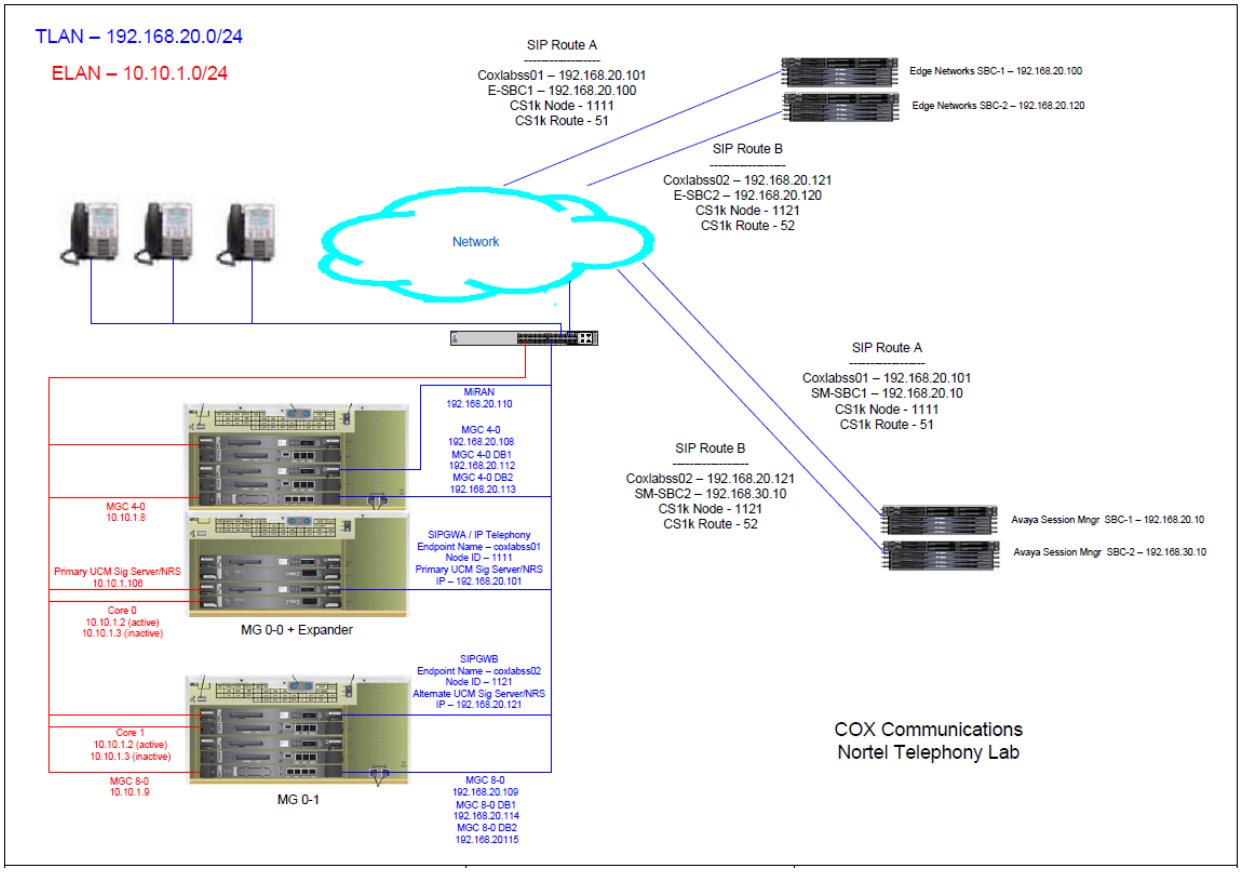


Figure 3 – SIP Trunk Lab Reference Network

The lab network consists of the following components:

- Avaya Aura™ Session Manager – The Session Manager provides a centralize SIP routing engine and integration of different services that enables communications between diverse SIP-enabled elements, e.g., IP PBXs, gateways, SIP applications, voice mail systems, etc. across the enterprise. The Session Manager enabled enterprise to implement centralized and policy-based routing, flexible dial plans, and consolidated trunking. Session Manager acts as a SIP interoperability facilitator among different SIP entities of a CS1000 SIP solution.
- Avaya Aura™ System Manager – Provides a common administration interface for centralized management of all Avaya Aura Session instances in an enterprise environment.
- Avaya/Nortel CS1000 – The Nortel CS1000 Communication Server (CS) 1000 is a robust and highly scalable IP PBX that supports traditional Meridian features as well as new IP telephony features, including Session Initiation Protocol (SIP). With the CS 1000, customers can evolve from a traditional TDM network to a converged IP network. The CS 1000 is an IP PBX that supports TDM PBX capabilities. Unlike traditional, circuit-switched PBX systems, the IP-based CS 1000 Core Call Server has no dedicated switching infrastructure. All voice communication between network elements uses a Telephony LAN (TLAN) subnet. Evolving to the CS 1000 and a converged IP network provides several advantages.

- Nortel Media Gateway – Provides the physical interfaces and media resources for Nortel CS1000.
- Nortel IP Phones – Represented with Nortel 1120E, 1230, and 1140E Series IP Telephones running SIP.
- The Cox E-SBC – The Edgewater Networks' (www.edgewaternetworks.com) EdgeMarc 6400. The EdgeMarc is the service demarcation point between customer's LAN network and Cox's WAN network and provides firewall/NAT traversal, B2BUA and SIP Application-level gateway. The EdgeMarc has diverse routes to a primary and secondary Acme SBC.
- Acme Packet Net-Net 9200 Session Border Controllers (SBC) – In practice, these are deployed in high availability and geo-redundant pairs.

4.1 Hardware Components

- Avaya s8800 Server for System Manager and Session Managers
- Nortel Media Gateway Controller (MGC) 4.0
- Nortel co-resident Call Server, Signaling Server, Network Routing Service (NRS), and Unified Communications Management (UCM)
- Avaya/Nortel 1120E IP Deskphone
- Avaya/Nortel 1230 IP Deskphone
- Avaya/Nortel 1140E IP Deskphone
- EdgeMarc 6400lf E-SBC
- Acme Net-Net 9200 SBC

4.2 Software Requirements

- Avaya/Nortel CS1K Call Server release 6, version 4021
- Avaya/Nortel CS1K Signaling Server release 6.00.18.00
- Avaya/Nortel CS1K Patches applied (see Appendix B below for all the listing)
- Avaya Aura System Manager release 5.2 (SP 2)
- Avaya Aura Session Manager release 5.2.2.0.522009
- EdgeMarc E-SBC 6400lf release 9.12.5

4.3 IP Subnet Recommendation

Routing and technical support are greatly simplified if the Cox E-SBC (EdgeMarc) is in the same subnet / VPN as the Avaya TLAN. Network best practices must applied, please consult with your Avaya/Nortel technical representative.

4.4 Example Configuration Information

The specific values listed in **Table 1** below and in subsequent sections are used in this lab configuration described in this document, and are for **illustrative purposes only**. Customers must obtain and use the specific values for their own specific configurations.

Table 1 – Example IP Address Configuration

Component	Cox Lab Value	Your Value
Avaya System Manager		
• Management IP Address	192.169.20.40	
Avaya Session Manager		
• Management IP Address #1	192.168.20.40	
• Management IP Address #2	192.168.20.42	

Component	Cox Lab Value	Your Value
• SIP IP Address #1	192.168.20.10	
• SIP IP Address #2	192.168.30.10	
Avaya/Nortel LAN		
• TLAN	192.168.20.0/24	
• ELAN	10.10.1.0/24	
Avaya/Nortel Meridian Integrated Recorded Announcements (MiRAN)		
• MiRAN IP Address	192.168.20.110	
Avaya/Nortel Media Gateway Controller (MGC) 4.0		
• MGC 4.0 TLAN IP	192.168.20.108	
• MGC 4.0 ELAN IP	10.10.1.8	
• MGC 4.0 DB1	192.168.20.112	
• MGC 4.0 DB2	192.168.20.113	
Avaya/Nortel Media Gateway Controller (MGC) 8.0		
• MGC 8.0 TLAN IP	192.168.20.109	
• MGC 8.0 ELAN IP	10.10.1.9	
• MGC 8.0 DB1	192.168.20.114	
• MGC 8.0 DB2	192.168.20.115	
Avaya/Nortel SIP Gateway A		
• Endpoint Name	coxlabss01	
• Node ID	1111	
• Primary UCM, SS, NRS TLAN IP	192.168.20.101	
• Primary UCM, SS, NRS ELAN IP	10.10.1.106	
Avaya/Nortel SIP Gateway B		
• Endpoint Name	coxlabss02	
• Node ID	1121	
• Alternate UCM, SS, NRS TLAN IP	192.168.20.121	
• Alternate UCM, SS, NRS ELAN IP	10.10.1.107	
E-SBC EdgeMarc 6400's		
• LAN Subnet Mask	255.255.255.0	
• LAN IP Address #1	192.168.20.100	
• LAN IP Address #2	192.168.20.120	

5 Overview

Avaya Aura™ Session Manager is the centralize control point of contact for all SIP-based communication for both internal and external services. Session Manager established SIP connections, process SIP sessions, and normalizes disparate SIP network components and provides a central contact point for external SIP trunking to the PSTN. The various SIP network components are represented as "SIP Entities" and the SIP Trunks between Session Manager and those components are represented as "Entity Links". Thus, for example, rather the Avaya Communication Manager connecting directly to all the Service Providers, but relies on Session Manager to route calls to the correct destination. This reduces the complexity of the dial plan and trunking administration needed.

5.1 Routing Policies

Routing Policies define how Session Manager routes calls between different SIP elements on the network. Routing Policies are dependent on several related items:

- SIP Entities
- Entity Links
- SIP Domains
- Locations
- Adaptations
- Dial Patterns
- Time Ranges

5.2 SIP Trunking Call Flows

To understand how Cox's SIP Trunking calls are handled by Session Manager and CS1000, we will described three basic call flows in this section, however for briefness not all possible call flows are described in this document.

6 Features Tested

6.1 SIP Trunk Supported Features

The following SIP Trunk capabilities and features are supported:

- Inbound and outbound calls
- G.711ulaw CODEC with 20 msec packetization rate
- Calling Party Number Presentation and Restriction
- DTMF translation to/from SIP signaling-based to RTP media-based (RFC 2833)
- High Availability (HA) Acme SBC
- Geo-Redundancy Acme SBC
- BroadWorks SIP Feature Server High Availability and Geo-Redundancy
- End-to-end SIP Trunk voice Quality of Service (QoS)
- Burstable Trunk capacity
- Business Continuity: Trunk Group Route Exhaustion

6.2 Avaya/Nortel CS1000 Tested Features

The following Avaya/Nortel CS1000 PBX features were successfully tested with Cox SIP Trunking for calls that traverse the SIP Trunks:

- 3-Way Calling
- Auto-Attendant
- Authorization Codes
- Blind Call Transfer
- Call Forward Busy
- Call Forward No Answer
- Call Forward Always
- Call Hold
- Calling Line ID Blocking per Call
- Call Park
- Call Pickup
- Call Waiting
- Caller ID – Name and Number
- Call Intercept
- Consultative Call Transfer
- Customer defined Calling Line ID outside the Trunk Group DID range (“spoofing”)
- Caller ID – Blocked call to Off-net number
- Do Not Disturb
- Group ID Delivery
- Sequential Ring
- Simultaneous Hunt
- Voice Mail (DTMF digits)

6.3 Call Testing

The following call types and optional Cox network-based features were verified with Cox SIP Trunks:

- Account Codes (Network Based)
- Authorization Codes (Network Based)
- Auto Attendant (Network Based)
- Hunt Groups (Network Based)
- 211 – Community Information and Referral Services
- 311 – Non-Emergency Police and Other Governmental Services
- 411 – Local Directory Assistance
- 511 – Traffic and Transportation Information (US); Provision of Weather and Traveller Information Services (Canada)
- 611 – Repair Service
- 711 – Telecommunications Relay Service (TRS)
- 811 – One Call Services to Protect Pipeline and Utilities from Excavation Damage (US); Non-Urgent Health Teletriage Services (Canada)
- 911 – Emergency Services
- International Calls
- Long Distance – 10- and 11-Digit Dialing
- Local call – 7- and 10-Digit Dialing
- Premium Services 900/976
- Toll free 800/866/877/888
- Directory Assistance 7-, 10- and 11-Digit Dialing 1+(NPA)-555-1212
- 10-10 Dialing Around
- G.711 Fax and Modem

6.4 Features Not Supported

- G.729, G.726 CODECs
- T.38 Fax Relay (Cox will support T.38 in 4Q11)

7 Caveats

There is no known caveat as of this writing.

8 Avaya Aura™ CS1000 and Session Manager Configuration Walkthrough

The following SIP Trunk configuration is based on the network configuration described above. The configuration example covers the following:

- Managing CS1000 with Element Manager
- Configuration of SIP Trunk Zone
- Configuration of IP Telephony Nodes
- Virtual Trunk Gateway Configuration
- Administration D-Channel
- Administration routes and trunks
- Virtual Terminal Sessions

The Avaya/Nortel CS1000 configuration detailed in this document is based on a lab environment with a basic dial plan to ensure interoperability between the Cox SIP network and Avaya Aura communications solution. Attention to detail is required to ensure these commands are implemented for successful SIP Trunk operation.

8.1 SIP Gateway Configuration

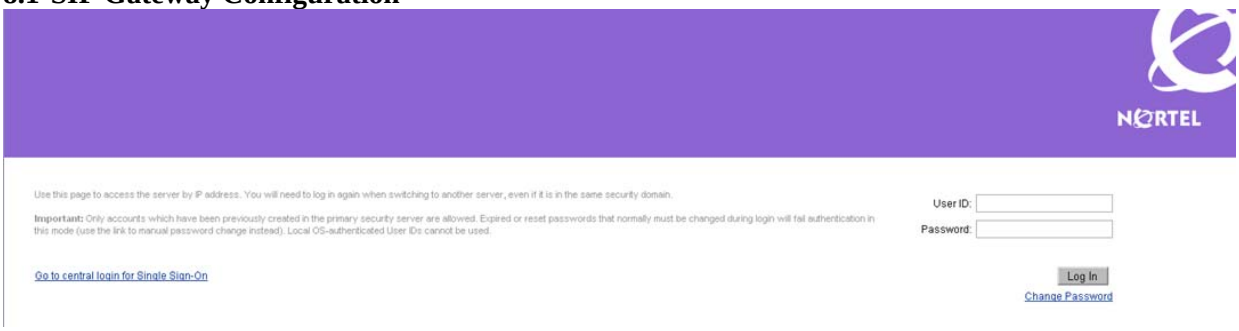


Figure 4 – Avaya/Nortel Element Manager Login Screen

8.1.1 Element Manager Login

The IP Telephony and IP Trunk configuration is only configurable via Element Manager, which can only be accessed through Unified Common Manager. User a browser (IE is the only supported Web Brower) and point to http://192.168.20.106 (or 192.168.20.107) and log in.

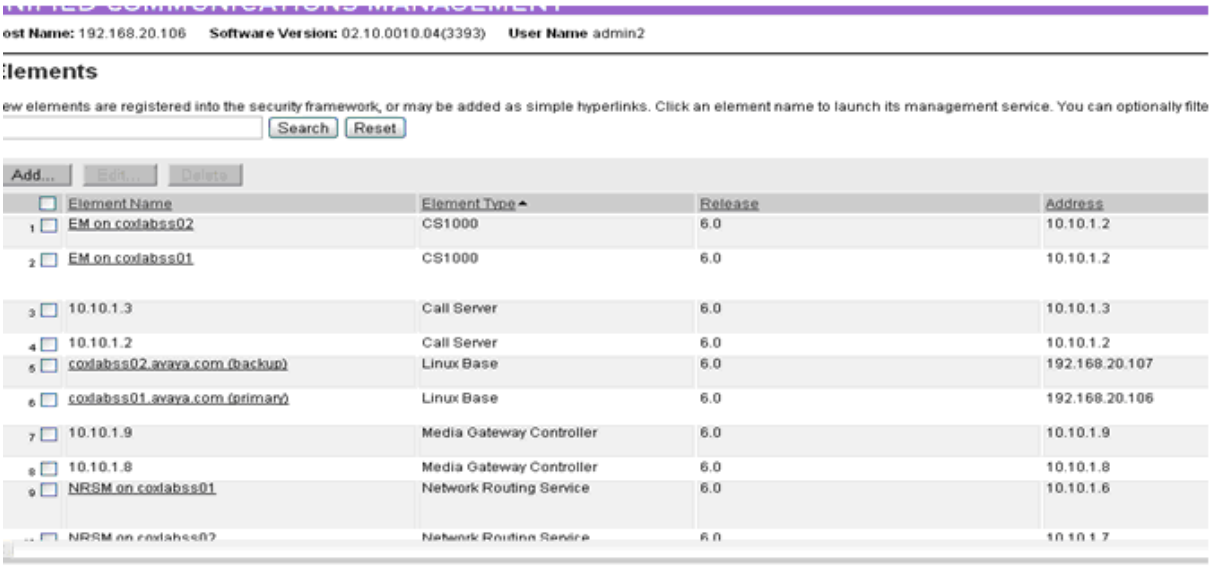


Figure 5 – Avaya/Nortel Element Manager Links Screen

8.1.2 Select one of the Element Manager links.

Select ever 'EM on coxlabss01' or 'EM on coxlabss02'. That is the CS1K Signaling Server one and two, respectively.

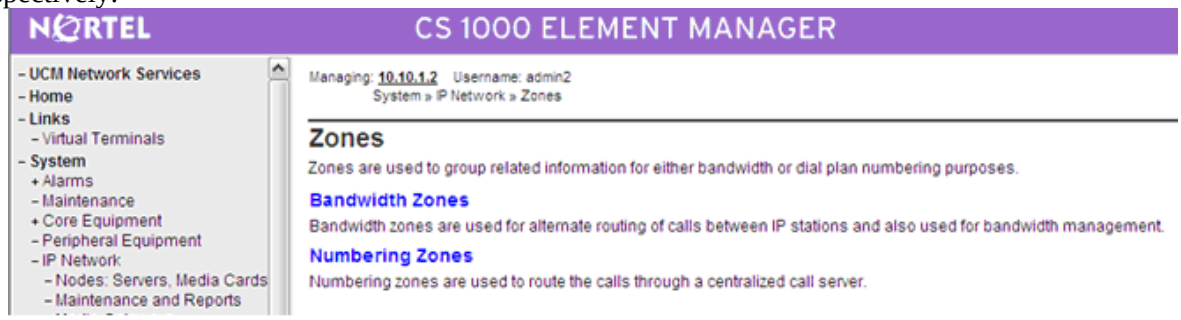


Figure 6 – Avaya/Nortel Element Manager Bandwidth Zones & Numbering Zones Screen

8.1.3 Configuration of the 'SIP Trunk Zone'.

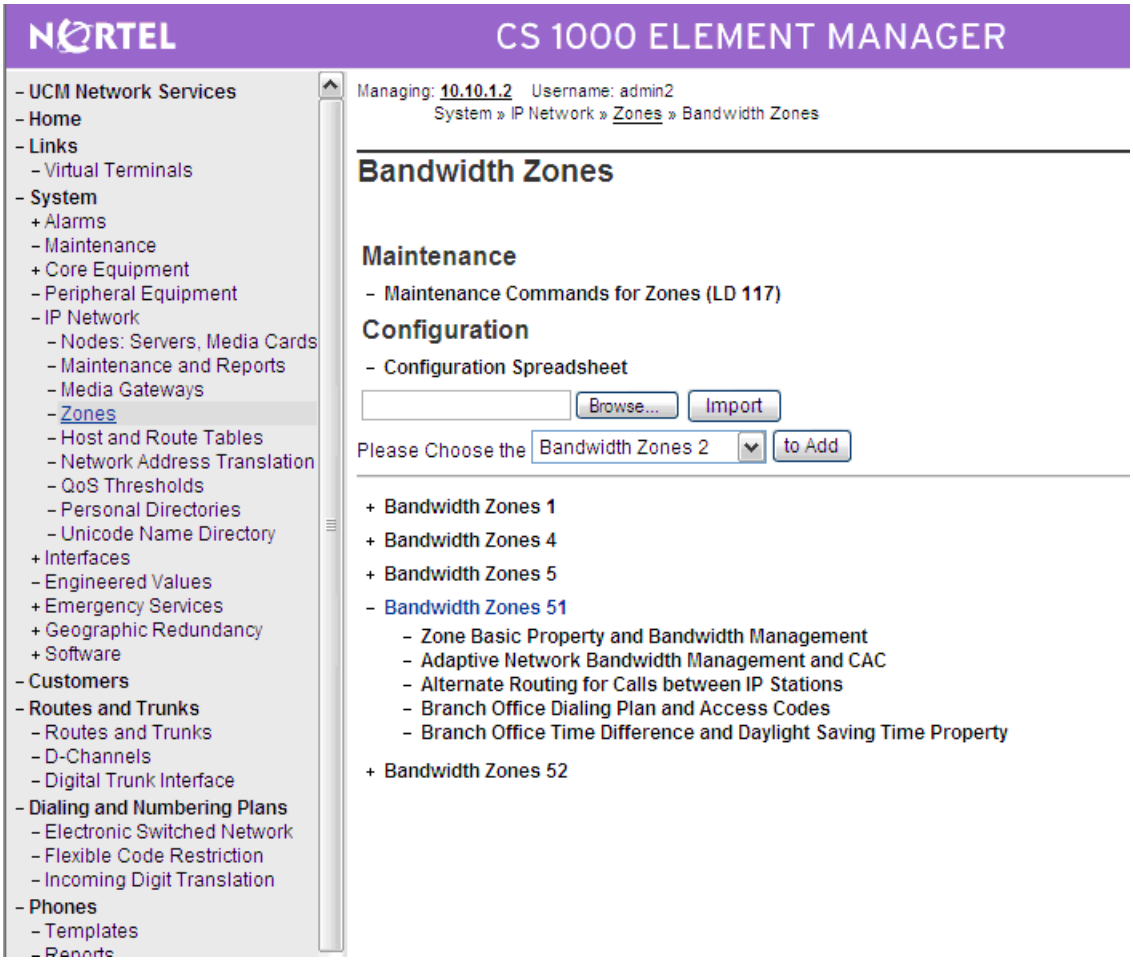


Figure 7 – Avaya/Nortel Element Manager Bandwidth Zones Detail

8.1.4 Configuration section of Bandwidth Zones.

Each gateway's SIP Trunks are in their own bandwidth management zone. The SIP Trunks of SIP Gateway A are on zone 51 and the SIP Trunks for SIP Gateway B are in zone 52.

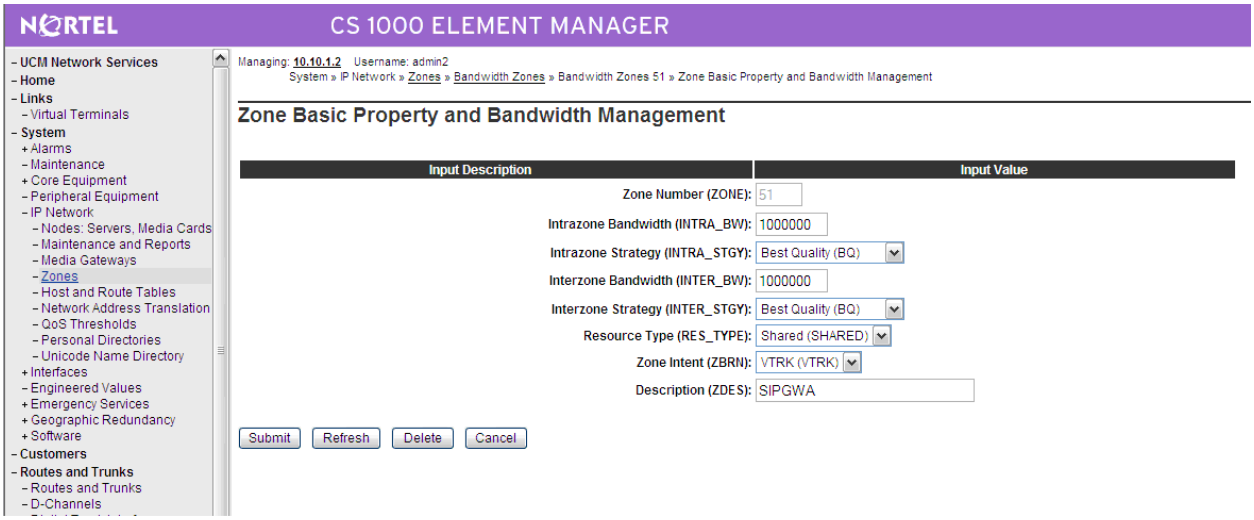


Figure 8 – Zones Basic Property and Bandwidth Management Screen

The zone is configured as a virtual trunk zone. Both zones are configured the same. The 'Best Quality' bandwidth strategy means the PBX will try to use G.711 first when negotiating a codec. G.729A is turned off and is not available to the SIP Gateways.

8.1.5 System Overview.

When you open Element Manager, the IP Node configuration pages can be found by clicking on 'Node, Servers, and Media Cards' in the left menu tab.

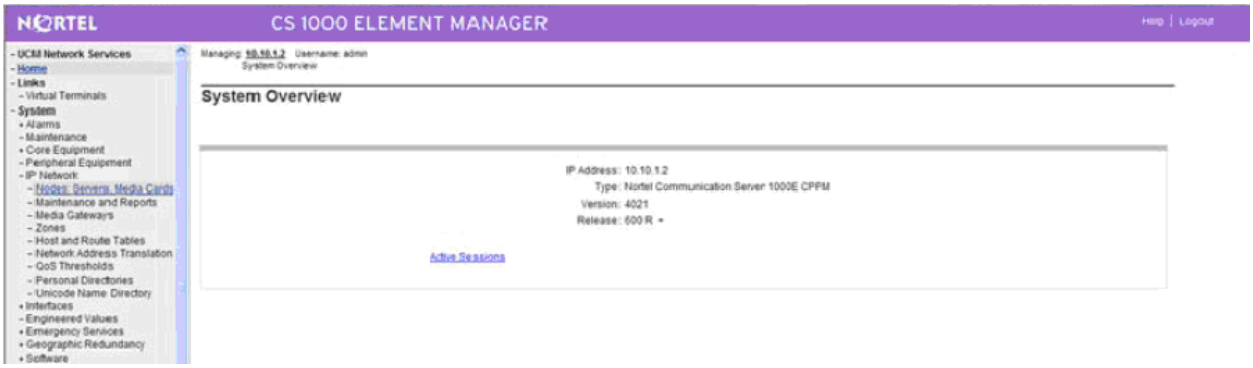


Figure 9 – Avaya/Nortel Element Manager System Overview

8.1.6 IP Telephony Nodes.

Each Signaling Server can register 1800 SIP Trunks and 1200 H.323. Only the leader Signaling Server of a node can facilitate IP trunk registration. Node 1111 is SIP Gateway A, and Node 1121 is SIP Gateway B. SIPGW-A has 15 SIP Trunks registered to it and SIPGW-B has 14 SIP trunks registered to it.

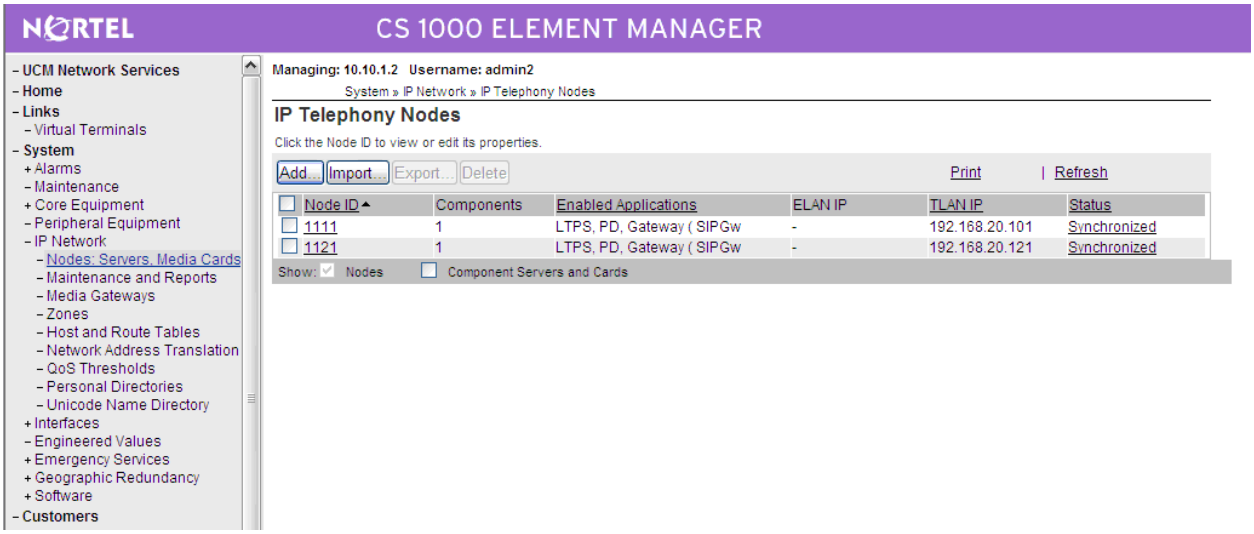


Figure 10 – Avaya/Nortel Element Manager IP Telephony Nodes

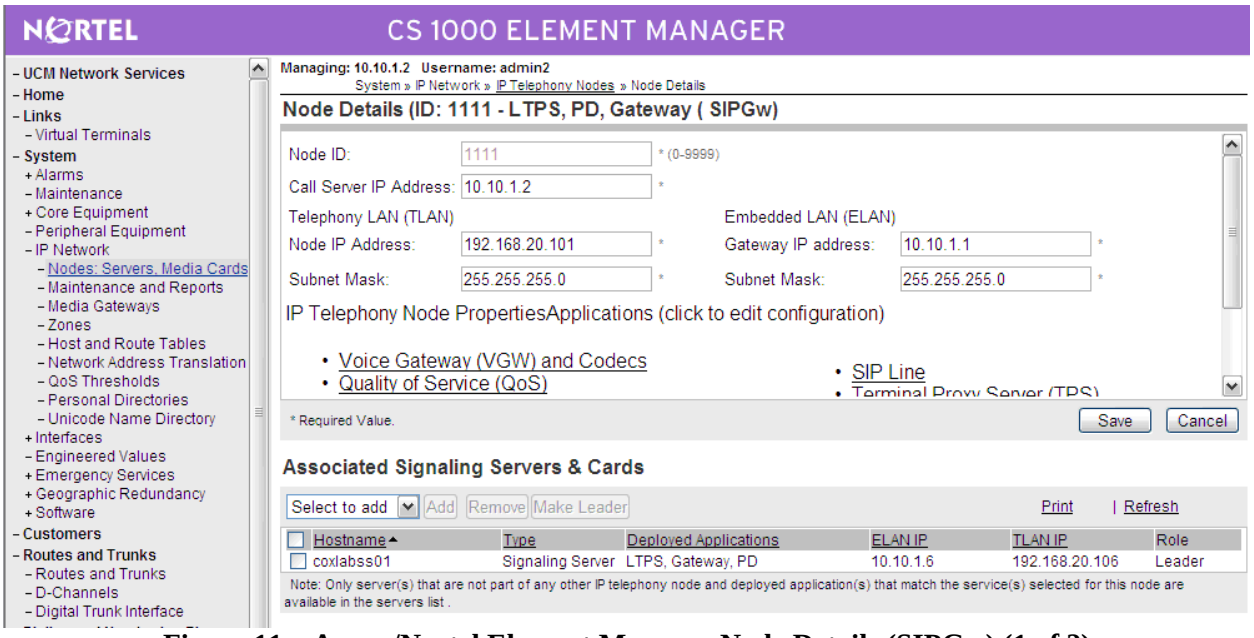


Figure 11 – Avaya/Nortel Element Manager Node Details (SIPGw) (1 of 2)

8.1.7 Node Details (SIPGw).

To see the IP Trunk configuration of a node, click on ‘Gateway’.

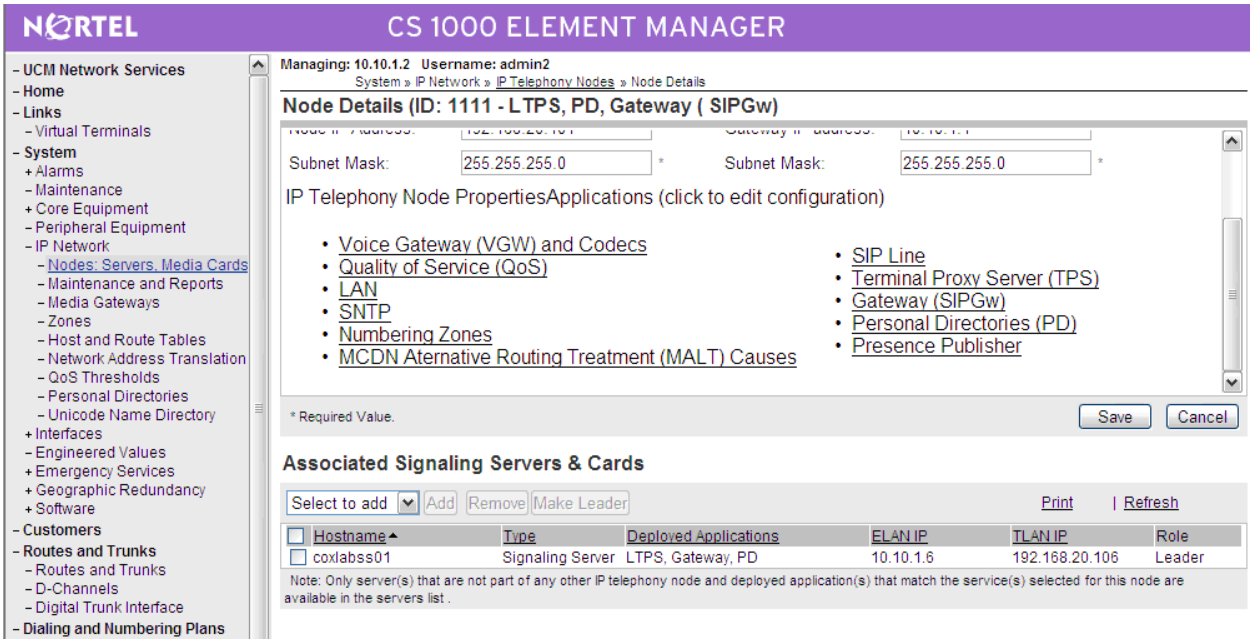


Figure 12 – Avaya/Nortel Element Manager Node Details (SIPGw) (2 of 2)

8.1.8 Virtual Trunk Gateway Configuration Details.

At the top you can see the SIP Domain Name and the SIP Endpoint name. The SIP Domain Name is one of the prompts to be configured when changing between the EdgeMarc E-SBCs and the Avaya Session Manager SBCs.

Note that Cox does not use DNS, therefore the LAN IP Address of the Cox E-SBC should be input for the SIP Domain name. Please cross reference the lab network IP addresses in **Table 1** with the CS1K Element Manager screens shown here.

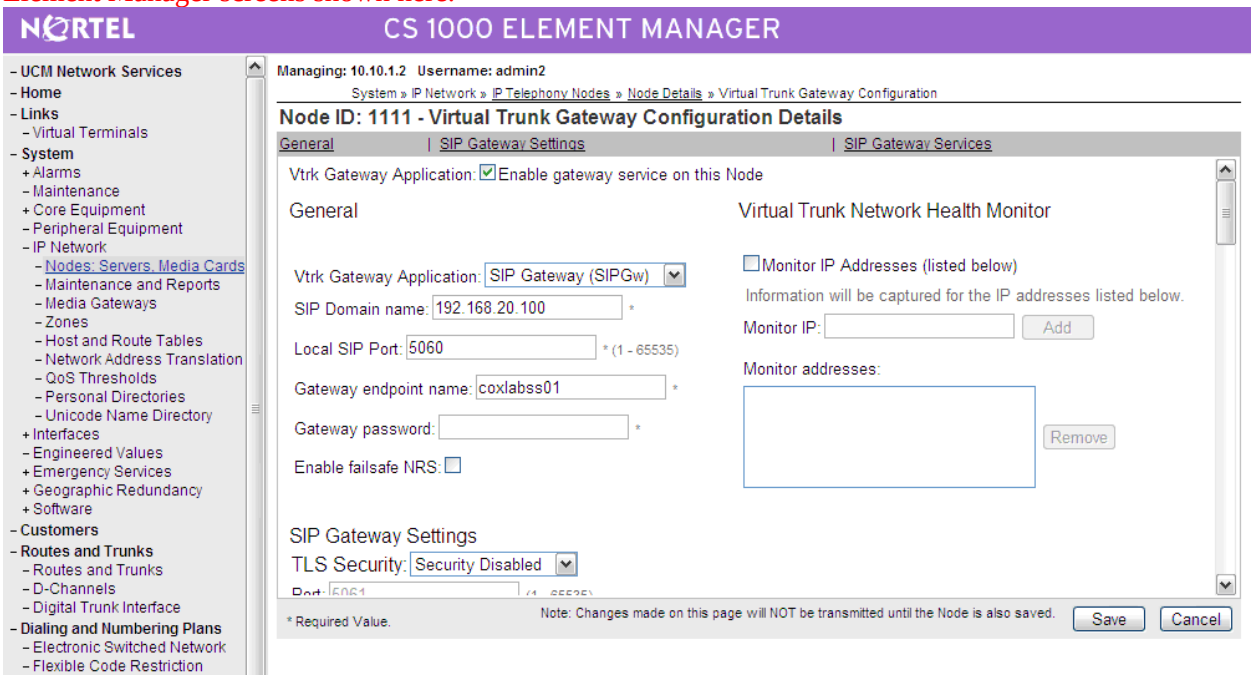


Figure 13 – Virtual Trunk Gateway Configuration – Node Details

The following shows the configuration of SIPGW-A when it is connected to EdgeMarc E-SBC-1. Notice that SIP Domain Name is 192.168.20.100. If it was SIPGW-B, the SIP Domain Name would be 192.168.20.120, which would start the configuration of the connection between it and EdgeMarc E-SBC-2.

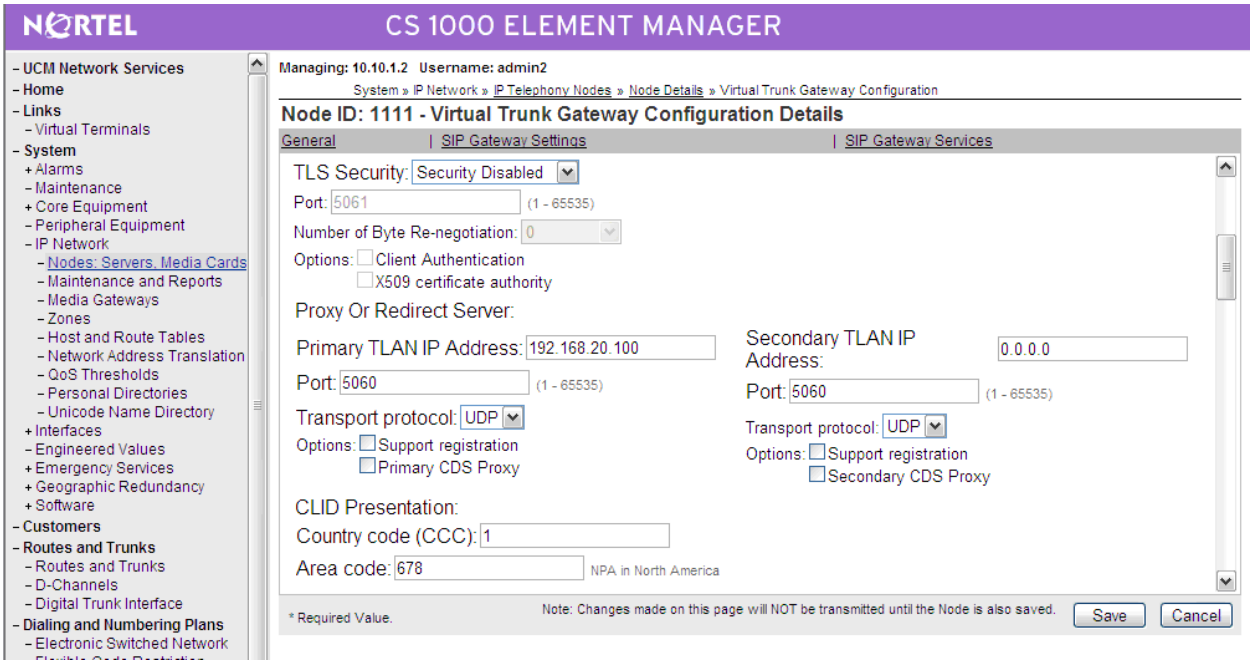


Figure 14 – Virtual Trunk Gateway Configuration - SIPGW

The Primary TLAN IP Address of the Proxy or Redirect server is the IP address of the device the CS1000E is sending calls to and from the SIP Gateway facilitated by the IP telephony node.

In this section the node configuration is the SIP URI Map. Notice the 'National' and 'Subscriber' boxes are empty.

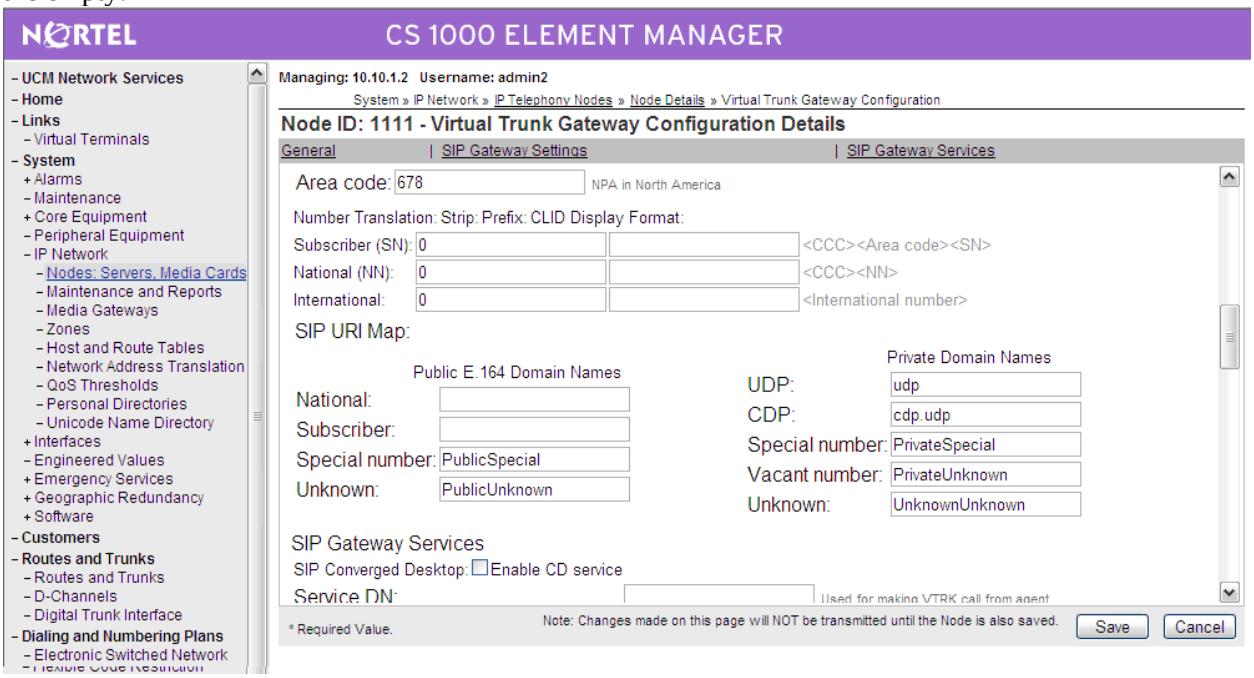


Figure 15 – Virtual Trunk Gateway Configuration: SIP URI Map

Make sure that you have selected '**SIP CTI Service**' in the following screen to Enable CTI service.

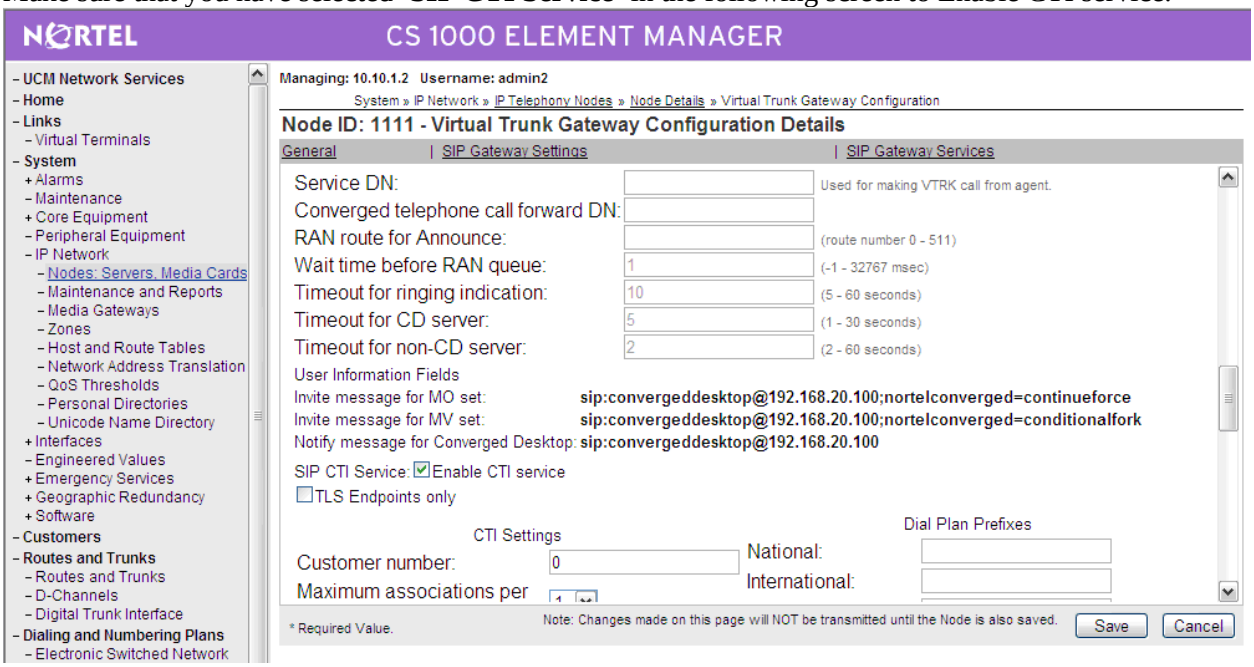


Figure 16 – Virtual Trunk Gateway Configuration: User Information Fields

The section shows the SIP CTI settings:

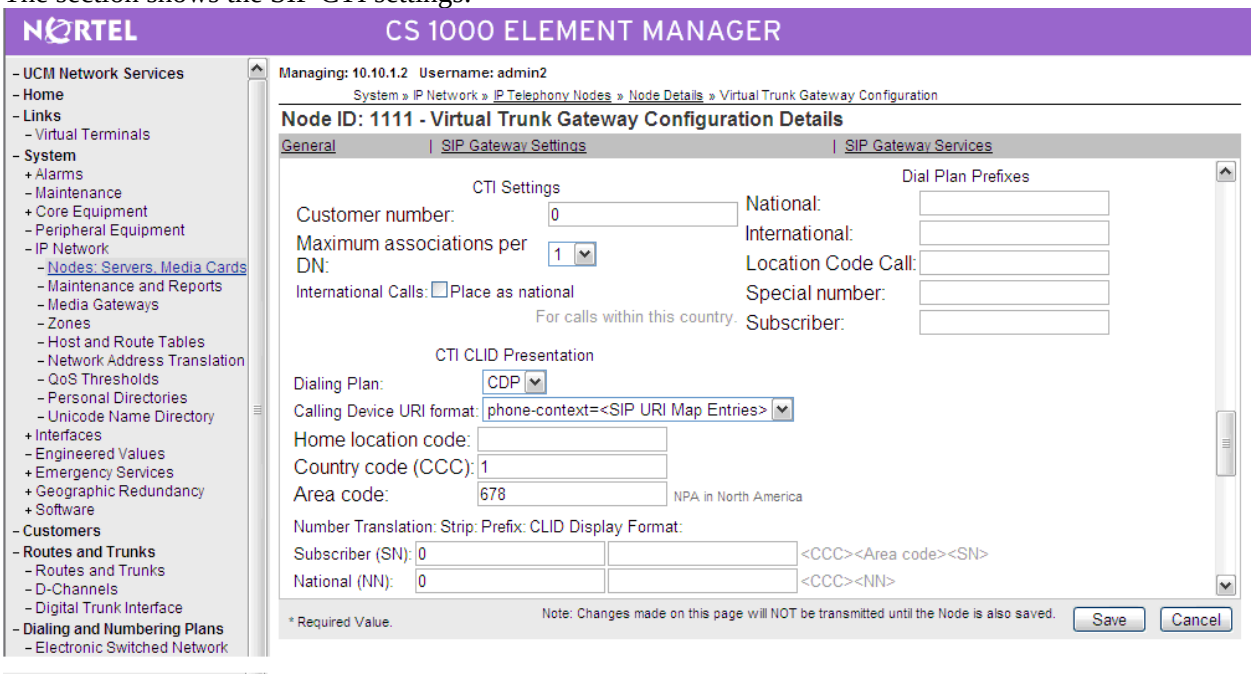


Figure 17 – Virtual Trunk Gateway Configuration: CIT Settings

Make sure set the '**Calling Device URI Format**' to phone context = SIP URI Map Entities:

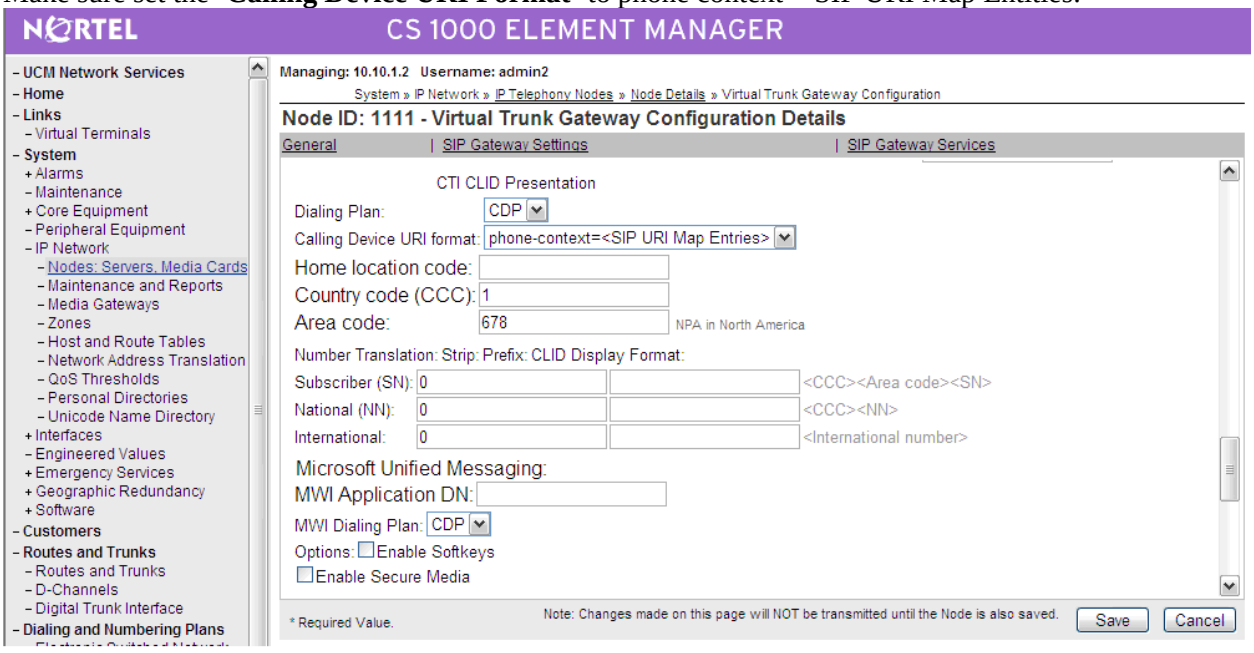


Figure 18 – Virtual Trunk Gateway Configuration: CTI CLID

The Subscriber Access and Auto Attendant Services were not used in the lab configuration:

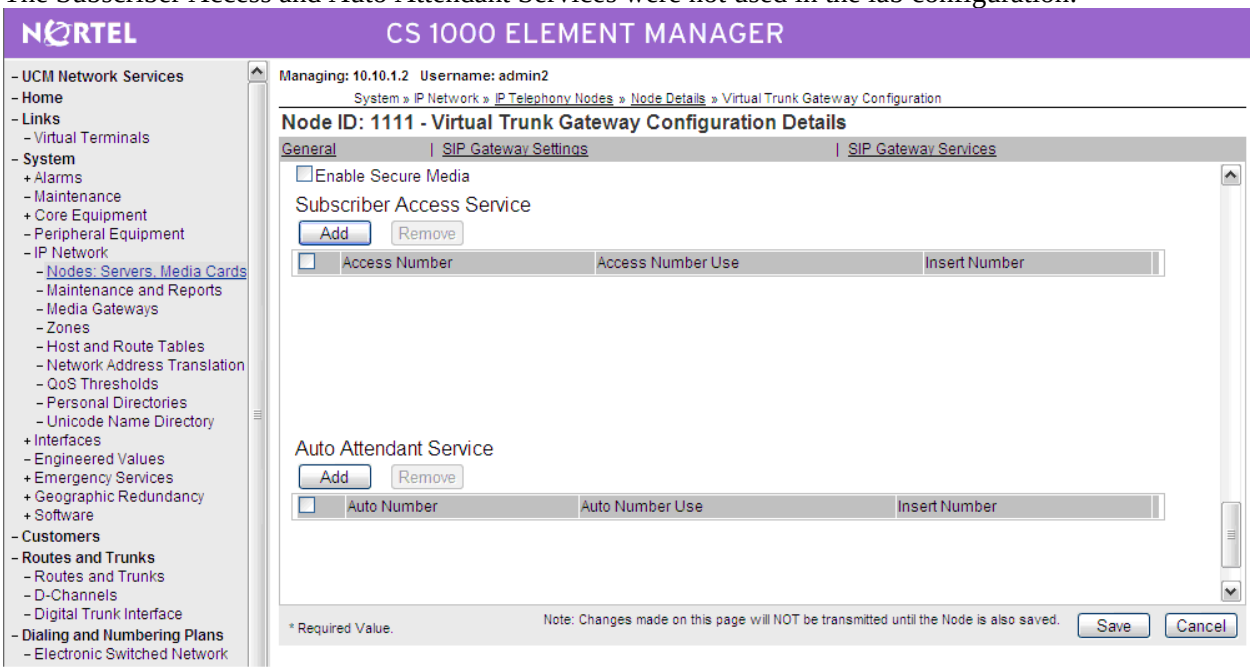


Figure 19 – Virtual Trunk Gateway Configuration: Subscriber and Auto Attendant Service

8.1.9 D-Channels.

Click on D-Channels on the left to see the DCH configurations. The system uses 1 virtual DCH per node. DCH51 and DCH 52 are the virtual DCH in the lab.

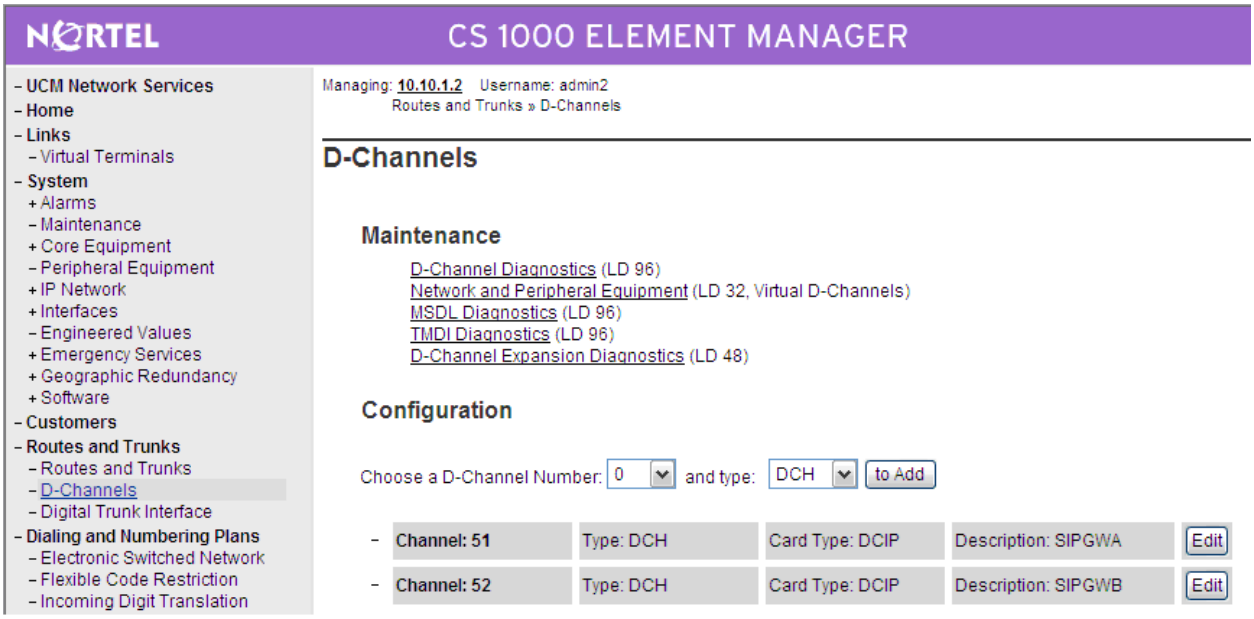


Figure 20 – Avaya/Nortel Element Manager D-Channels Configuration

8.1.10 D-Channels 51 Property Configuration.

- The USR parameter is set to ISLD.
- The IFC parameter is set to SL1.

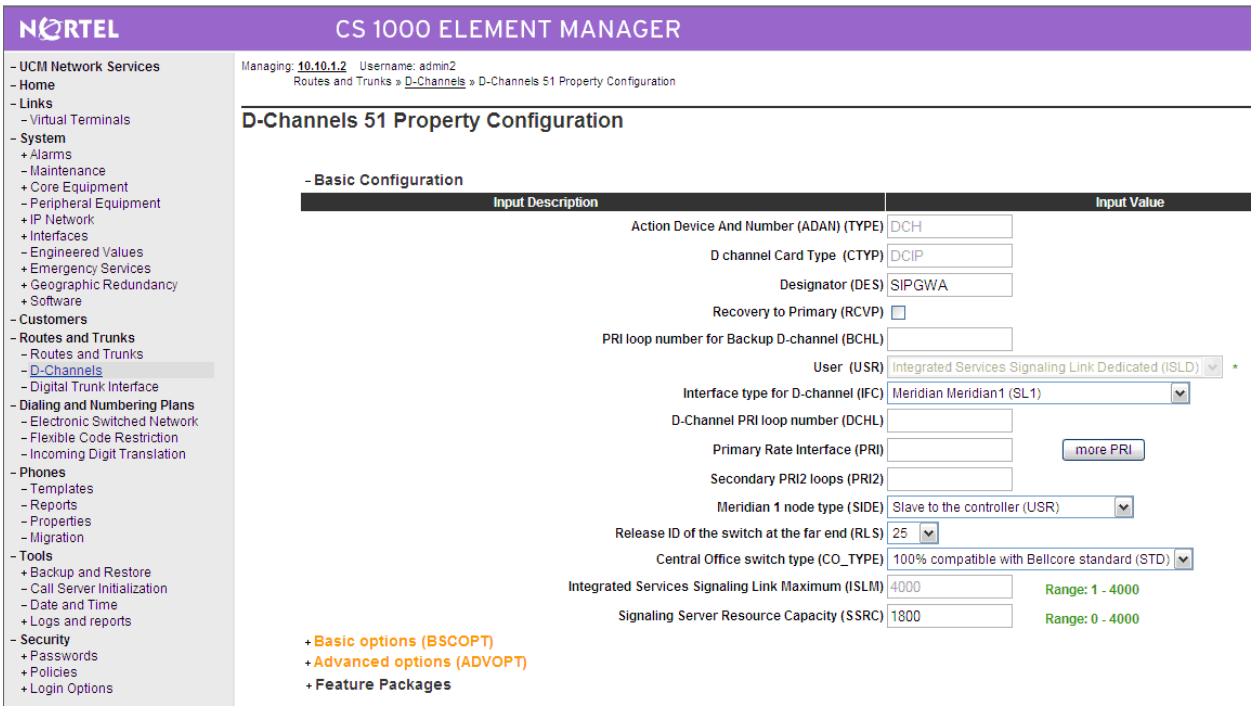


Figure 21 – Avaya/Nortel Element Manager D-Channels Property Configuration Screen

8.1.11 Routes and Trunks

Click on Routes and Trunks on the left panel to see the Route Data Block configuration. The SIP Trunk Route for SIPGW-A is Route 51, and the SIP Trunk Route for SIPGW-B is Route 52.

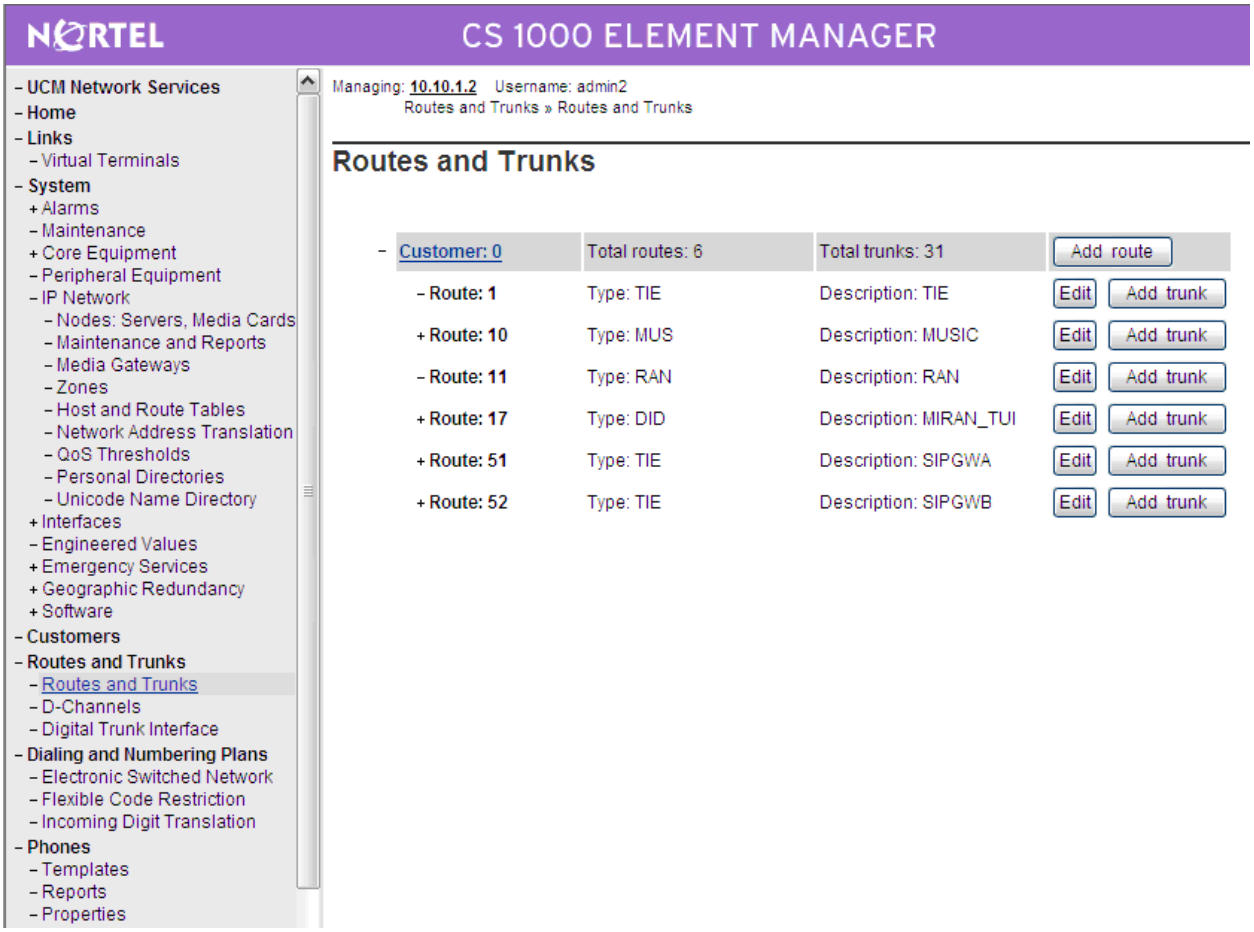


Figure 22 – Avaya/Nortel Element Manager Routes and Trunks Configuration Screen

Click the Route name to expand it to view the Trunks and 'Edit' to see the configuration.

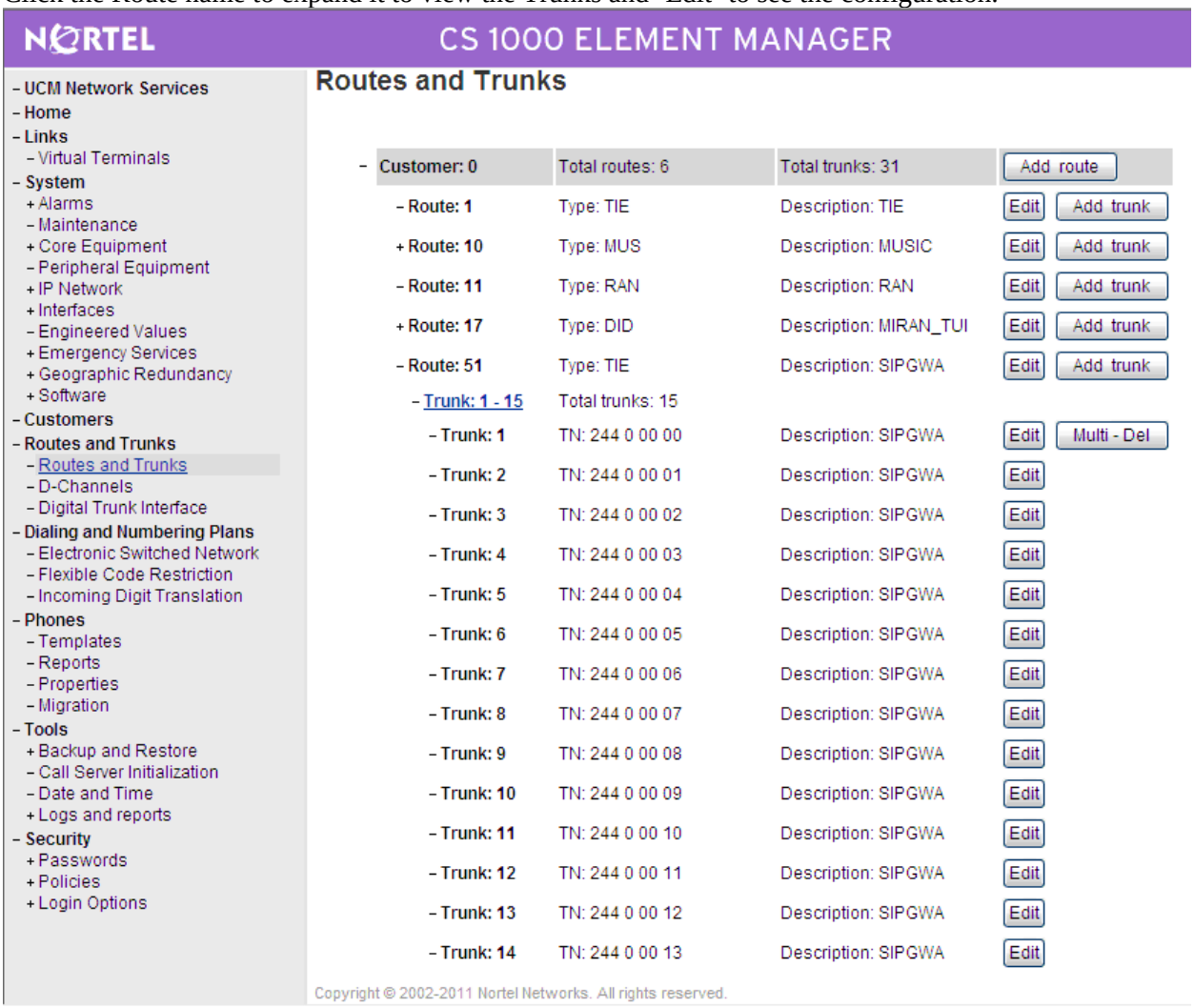


Figure 23 – Route 51 Trunk Listing

To see the configuration of a trunk, click 'Edit' on a Trunk. For example: Route 51.

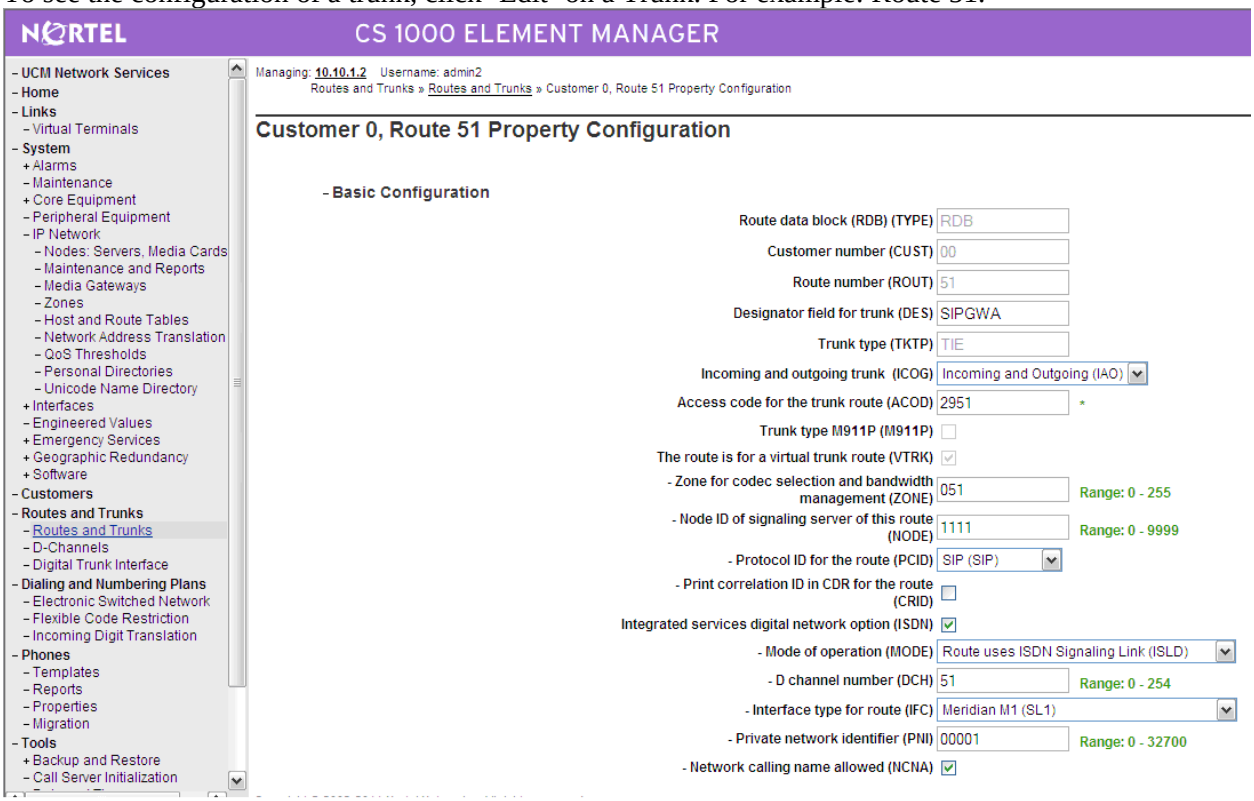


Figure 24 – Route 51 Property Configuration (1 of 2)

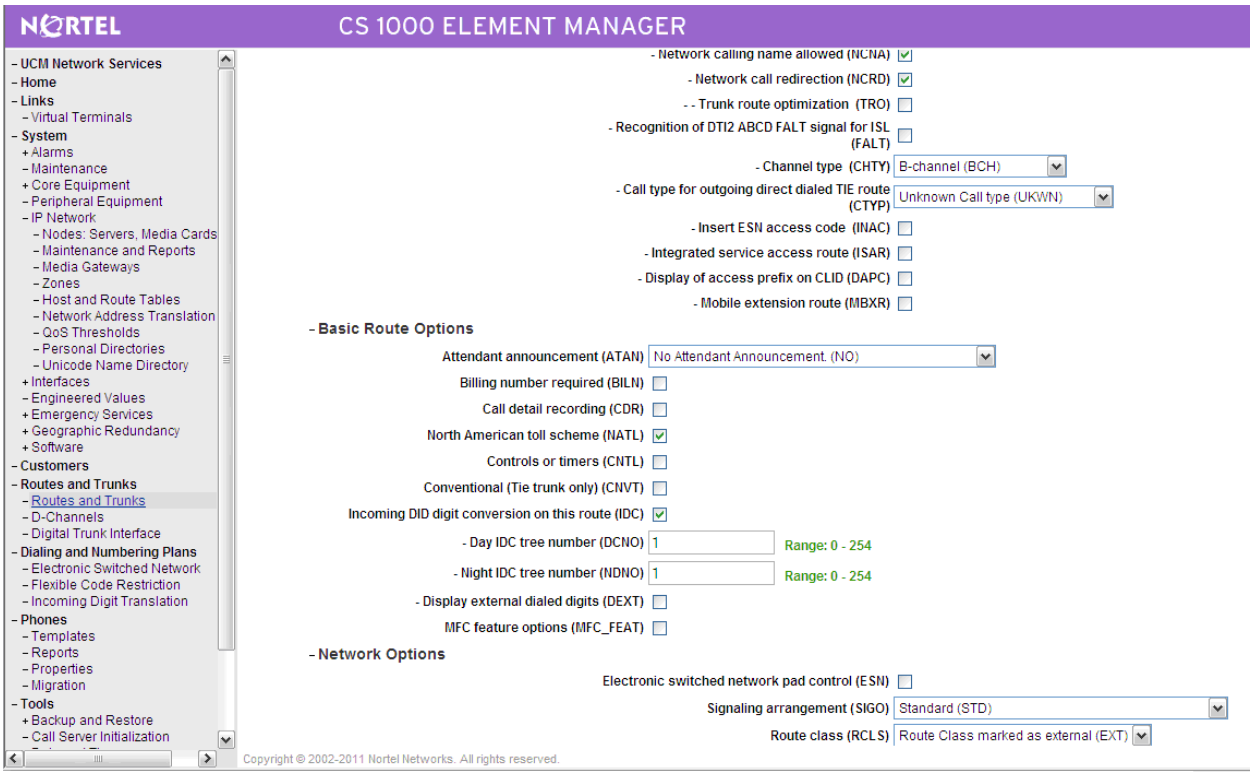


Figure 25 – Route 51 Property Configuration (1 of 4)

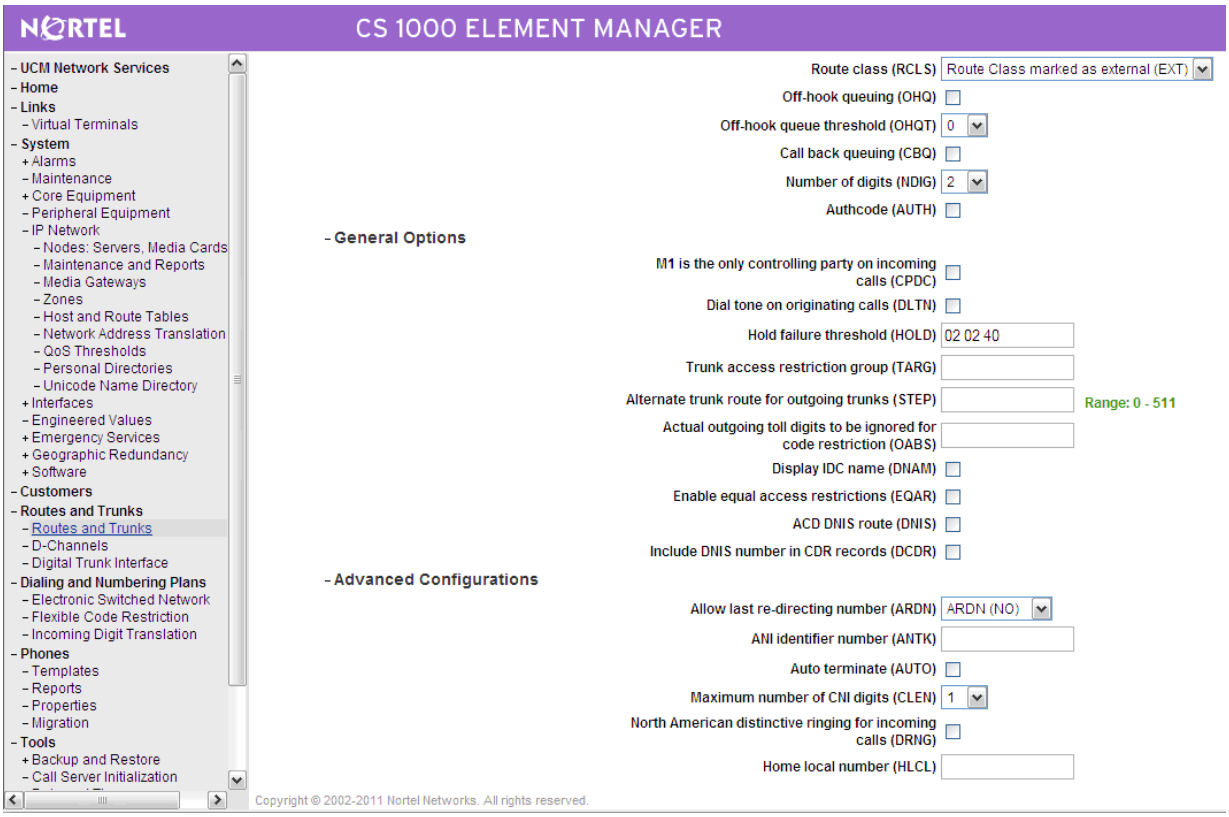


Figure 26 – Route 51 Property Configuration (3 of 4)

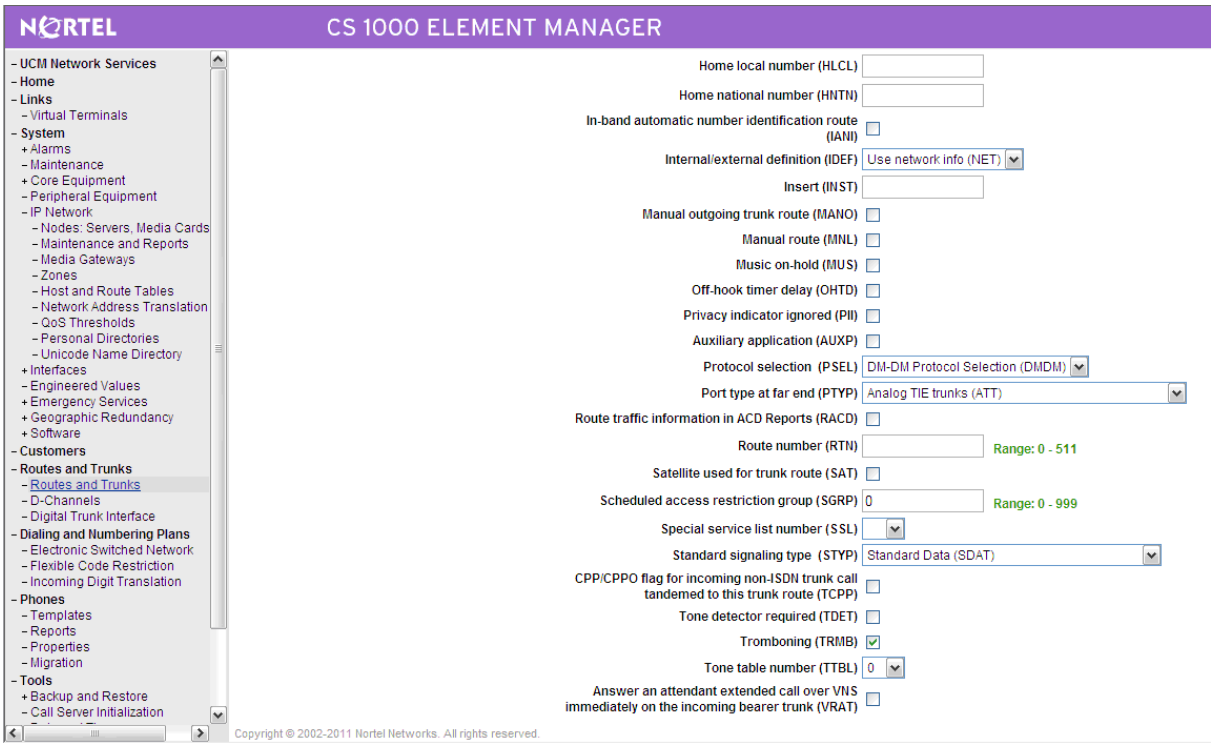


Figure 27 – Route 51 Property Configuration (4 of 4)

8.1.12 Virtual Terminal Sessions

A link to each device was created with a CLI under 'Virtual Terminals'. The devices are the PBX, each MGC card, and each Signaling Server/NRS/SIP Gateway. The MGC card credentials are the same as the PBX.

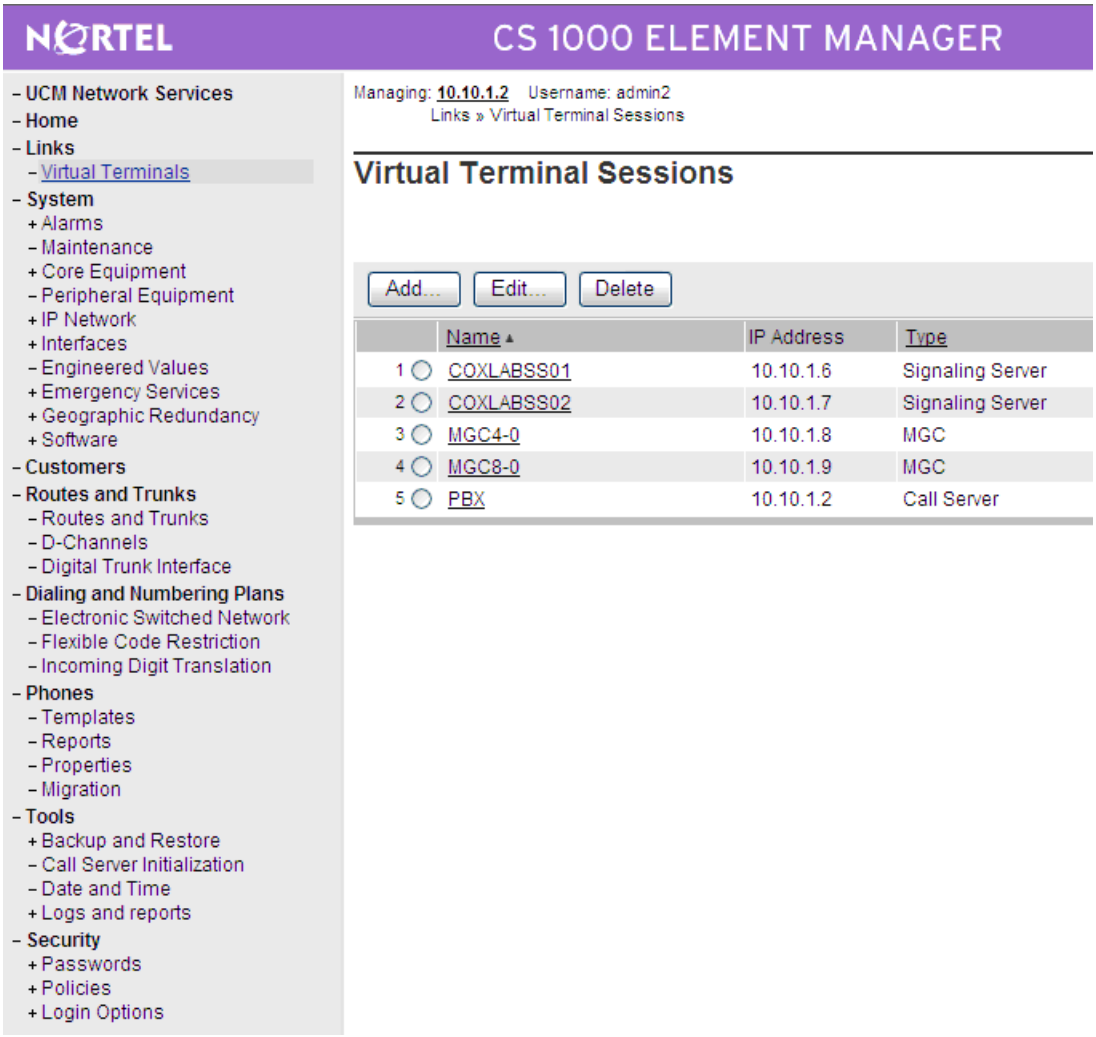


Figure 28 – Avaya/Nortel Element Manager Virtual Terminal Sessions

The yellow envelope with your software has the documentation CDs. The Software I/O Guides have all of the overlay prompts, their accepted input, and definitions. There are three guides:

1. Administration
2. System Messages
3. Maintenance.

8.1.13 Virtual Terminal Sessions

After you click 'Connect', place the cursor in the bar at the bottom of the window in order to type.

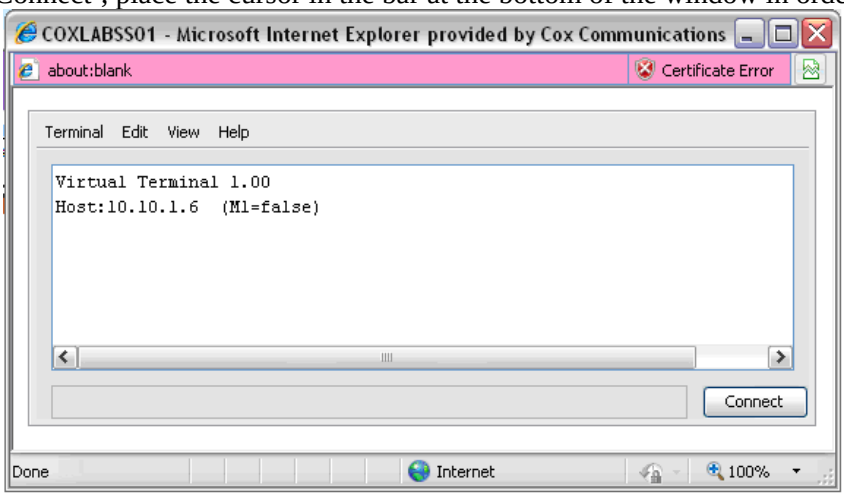


Figure 29 – Virtual Terminal Active Session

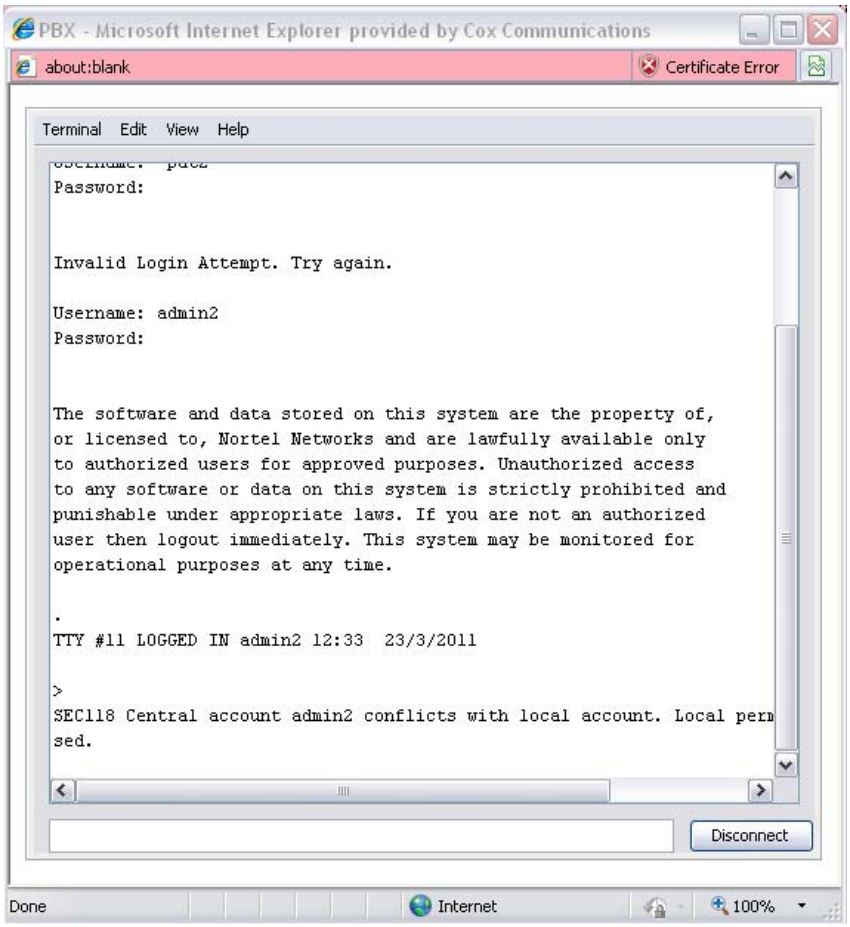


Figure 30 – Interactive Virtual Terminal Sessions

8.1.14 CLI outputs commands for CS1000 Configuration

DCH 51

>ld 22
PT2000

REQ prt
TYPE adan dch 51

ADAN DCH 51
CTYP DCIP
DES SIP
USR ISLD
ISLM 4000
SSRC 1800
OTBF 32
NASA NO
IFC SL1
CNEG 1
RLS ID 25
RCAP MWI
MBGA NO
H323
OVLR NO
OVLS NO

DCH 52

>ld 22
PT2000

REQ prt
TYPE adan dch 52

ADAN DCH 52
CTYP DCIP
DES SIP
USR ISLD
ISLM 4000
SSRC 1800
OTBF 32
NASA NO
IFC SL1
CNEG 1
RLS ID 25
RCAP MWI
MBGA NO
H323
OVLR NO
OVLS NO

DMI Table

>ld 86
ESN000

MEM AVAIL: (U/P): 98198537 USED
U P: 5365327 88485 TOT: 103652349
DISK SPACE NEEDED: 122 KBYTES
REQ prt
CUST 0
FEAT dgt
DMI

DMI 1
DEL 0
ISPN NO
CTYP NPA

DMI 9
DEL 0
ISPN NO
INST 9
CTYP NCHG

DMI 11
DEL 0
ISPN NO
CTYP CDP

DMI 12
DEL 0
ISPN NO
INST 678238
CTYP NPA

Figure 31 – CLI output for DCH and DMI

Route 51 Members

>ld 21
PT1000

REQ: ltm
CUST 0
ROUT 51

TYPE TLST
TKTP TIE
ROUT 51
DES SIPGWA
TN 244 0 00 00 MBER 1 SIPGWA
TN 244 0 00 01 MBER 2 SIPGWA
TN 244 0 00 02 MBER 3 SIPGWA
TN 244 0 00 03 MBER 4 SIPGWA
TN 244 0 00 04 MBER 5 SIPGWA
TN 244 0 00 05 MBER 6 SIPGWA
TN 244 0 00 06 MBER 7 SIPGWA
TN 244 0 00 07 MBER 8 SIPGWA
TN 244 0 00 08 MBER 9 SIPGWA
TN 244 0 00 09 MBER 10 SIPGWA
TN 244 0 00 10 MBER 11 SIPGWA
TN 244 0 00 11 MBER 12 SIPGWA
TN 244 0 00 12 MBER 13 SIPGWA
TN 244 0 00 13 MBER 14 SIPGWA
TN 244 0 00 14 MBER 15 SIPGWA

Route 51

>ld 21
PT1000

REQ: prt
TYPE: rdb
CUST 0
ROUT 51

TYPE RDB
CUST 00
ROUT 51
DES SIPGWA
TKTP TIE
M911P NO
ESN NO
CNVT NO
SAT NO
RCLS EXT
VTRK YES
ZONE 051
PCID SIP
CRID NO
NODE 1111
DTRK NO
ISDN YES
MODE ISLD
DCH 51
IFC SL1
PNI 00001
NCNA YES
NCRD YES
TRO NO
FALT NO
CTYP UKWN
INAC NO
ISAR NO
DAPC NO
MBXR NO
PTYP ATT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN

TRMB YES
STEP
ACOD 2951
TCPP NO
PII NO
AUXP NO
TARG
CLEN 10
BILN NO
OABS
INST
IDC YES
DCNO 1
NDNO 1 *
DEXT NO
DNAM NO
ANTK
SIGO STD
STYP SDAT
ICIS YES
TIMR ICF 512
OGF 512
EOD 13952
DSI 34944
NRD 10112
DDL 70
ODT 4096
RGV 640
GRD 896
SFB 3
NBS 2048
NBL 4096

IENB 5
TFD 0
VSS 0
VGD 6
SST 5 0
NEDC ORG
FEDC ORG
CPDC NO

DLTN NO

HOLD 02 02 40
SEIZ 02 02
SVFL 02 02
DRNG NO
CDR NO
VRAT NO
MUS NO
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
TDET NO
TTBL 0
ATAN NO
OHTD NO
PLEV 2
ALRM NO
ART 0
SGRP 0
ARDN NO

AACR NO

SIPGW-A TN

>ld 20

PT0000
REQ: prt
TYPE: tn
TYPE TNB
TN 244 0 0 0
DATE
PAGE
DES

DES SIPGWA
TN 244 0 00 00 VIRTUAL
TYPE IPTI
CDEN 8D
CUST 0
XTRK VTRK
ZONE 051
LDOP BOP
TIMP 600
BIMP 600
AUTO_BIMP NO
NMUS NO
TRK ANLG
NCOS 0
RTMB 51 1
CHID 1
TGAR 0
STRI/STRO WNK WNK
SUPN YES
AST NO
IAPG 0
CLS CTD DTN CND ECD WTA LPR
APN THFD SPCD MSNV
P10 NTC
TKID
AACR NO
DATE 21 OCT 2010

Figure 32 – CLI output for Route 51

Route 52 Members

>ld 21
PT1000

REQ: ltm
CUST 0
ROUT 52

TYPE TLST
TKTP TIE
ROUT 52
DES SIPGWB
TN 244 0 01 00 MBER 1 SIPGWB
TN 244 0 01 01 MBER 2 SIPGWB
TN 244 0 01 02 MBER 3 SIPGWB
TN 244 0 01 03 MBER 4 SIPGWB
TN 244 0 01 04 MBER 5 SIPGWB
TN 244 0 01 05 MBER 6 SIPGWB
TN 244 0 01 06 MBER 7 SIPGWB
TN 244 0 01 07 MBER 8 SIPGWB
TN 244 0 01 08 MBER 9 SIPGWB
TN 244 0 01 09 MBER 10 SIPGWB
TN 244 0 01 10 MBER 11 SIPGWB
TN 244 0 01 11 MBER 12 SIPGWB
TN 244 0 01 12 MBER 13 SIPGWB
TN 244 0 01 13 MBER 14 SIPGWB

Route 52

>ld 21
PT1000

REQ: prt
TYPE: rdb
CUST 0
ROUT 52

TYPE RDB
CUST 00
ROUT 52
DES SIPGWB
TKTP TIE
M911P NO
ESN NO
CNVT NO
SAT NO
RCLS EXT
VTRK YES
ZONE 052
PCID SIP
CRID NO
NODE 1121
DTRK NO
ISDN YES
MODE ISLD
DCH 52
IFC SL1
PNI 00001
NCNA YES
NCRD YES
TRO NO
FALT NO
CTYP UKWN
INAC NO
ISAR NO
DAPC NO
MBXR NO
PTYP ATT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB YES
STEP
ACOD 2952
TCPP NO
PII NO
AUXP NO
TARG
CLEN 10
BILN NO
OABS
INST
IDC YES
DCNO 1
NDNO 1 *
DEXT NO
DNAM NO
ANTK
SIGO STD
STYP SDAT
ICIS YES
TIMR ICF 512
OGF 512
EOD 13952
DSI 34944
NRD 10112
DDL 70
ODT 4096
RGV 640
GRD 896
SFB 3
NBS 2048
NBL 4096

IENB 5
TFD 0
VSS 0
VGD 6
SST 5 0
NEDC ORG
FEDC ORG
CPDC NO
DLTN NO
HOLD 02 02 40
SEIZ 02 02
SVFL 02 02
DRNG NO
CDR NO
VRAT NO
MUS NO
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
TDET NO
TTBL 0
ATAN NO
OHTD NO
PLEV 2
ALRM NO
ART 0
SGRP 0
ARDN NO

AACR NO

SIPGW-B TN

>ld 20

PT0000
REQ: prt
TYPE: tn
TYPE TNB
TN 244 0 1 0
DATE
PAGE
DES

DES SIPGWB
TN 244 0 01 00 VIRTUAL
TYPE IPTI
CDEN 8D
CUST 0
XTRK VTRK
ZONE 052
LDOP BOP
TIMP 600
BIMP 600
AUTO_BIMP NO
NMUS NO
TRK ANLG
NCOS 0
RTMB 52 1
CHID 16
TGAR 0
STRI/STRO WNK WNK
SUPN YES
AST NO
IAPG 0
CLS CTD DTN CND ECD WTA LPR
APN THFD SPCD MSNV
P10 NTC
TKID
AACR NO
DATE 21 OCT 2010

Figure 33 – CLI output for Route 52

These area codes routed over these RLIs...

404, 678, 770

```
>ld 86
ESN000

MEM AVAIL: (U/P): 98198537    USED U P:
5365327 88485    TOT: 103652349
DISK SPACE NEEDED: 122 KBYTES
REQ  prt
CUST 0
FEAT rlb
RLI  2

RLI  2
ENTR 0
LTER NO
ROUT 51
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  1
ISDM 0
FCI  0
FSNI 0
DORG NO
SBOC RRA
COPT 2
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ENTR 1
LTER NO
ROUT 52
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  1
ISDM 0
FCI  0
FSNI 0
DORG NO
SBOC RRA
COPT 2
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ISET 1
NALT 5
MFRL 0
OVLL 0
```

1229, 1470, 1706, 1762, 1912

```
>ld 86
ESN000

MEM AVAIL: (U/P): 98198537    USED
U P: 5365327 88485    TOT: 103652349
DISK SPACE NEEDED: 122 KBYTES
REQ  prt
CUST 0
FEAT rlb
RLI  3

RLI  3
ENTR 0
LTER NO
ROUT 51
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
ISDM 0
FCI  0
FSNI 0
DORG NO
SBOC RRA
COPT 2
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ENTR 1
LTER NO
ROUT 52
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
ISDM 0
FCI  0
FSNI 0
DORG NO
SBOC RRA
COPT 2
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ISET 1
NALT 5
MFRL 0
OVLL 0
```

Figure 34 – CLI output Area Codes and RLIs (1 of 3)

These area codes routed over this RLI...

1204, 1226, 1250, 1289, 1306,
1403, 1416, 1418, 1450, 1506,
1519, 1581, 1587, 1600, 1604,
1613, 1647, 1705, 1709, 1778,
1780, 1807, 1819, 1902, 1905

```
>ld 86
ESN000

MEM AVAIL: (U/P): 98198537    USED
U P: 5365327 88485    TOT: 103652349
DISK SPACE NEEDED: 122 KBYTES
REQ  prt
CUST 0
FEAT rlb
RLI  6

RLI  6
ENTR 0
LTER NO
ROUT 51
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
ISDM 0
FCI  0
FSNI 0
DORG NO
SBOC RRA
COPT 2
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ENTR 1
LTER NO
ROUT 52
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
ISDM 0
FCI  0
FSNI 0
DORG NO
SBOC RRA
COPT 2
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ENTR 2
LTER NO
ROUT 0
TOD  0 ON  1 ON  2 ON  3 ON
  4 ON  5 ON  6 ON  7 ON
VNS  NO
CNV  NO
EXP  NO
FRL  0
DMI  0
FCI  0
FSNI 0
SBOC NRR
IDBB DBD
IOHQ NO
OHQ  NO
CBQ  NO

ISET 1
NALT 5
MFRL 0
OVLL 0
```

Figure 35 – CLI output for Area Codes and RLIs (2 of 3)

These area codes routed over this RLI… I showed RLI 6 before this one because the rest of the area codes go out over this RLI.

```
>ld 86
ESN000

MEM AVAIL: (U/P): 98198537    USED U P:
5365327 88485    TOT: 103652349
DISK SPACE NEEDED: 122 KBYTES
REQ  prt
CUST 0
FEAT rlb
RLI  5

RLI  5
ENTR 0
LTER NO
ROUT 51
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
ISDM 0
FCI  0
FSNI 0
DORG NO
SBOC RRA
COPT 2
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ENTR 1
LTER NO
ROUT 52
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
ISDM 0
FCI  0
FSNI 0
DORG NO
SBOC RRA
COPT 2
IDBB DBA
IOHQ NO
OHQ  NO
CBQ  NO

ENTR 2
LTER NO
ROUT 0
TOD  0 ON  1 ON  2 ON  3 ON
4 ON  5 ON  6 ON  7 ON
VNS  NO
CNV  NO
EXP  NO
FRL  0
DMI  0
FCI  0
FSNI 0
SBOC NRR
IDBB DBD
IOHQ NO
OHQ  NO
CBQ  NO

ISET 1
NALT 5
MFRL 0
OVLL 0
```

Figure 36 – CLI output for Area Codes and RLIs (3 of 3)

9 Avaya Aura™ Session Manager System Configuration

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

Network Routing Policy

- SIP Domain
- Logical/Physical location that can be occupied by SIP Entities
- SIP Entities corresponding to CS1000 and Session Manager
- Adaptations Modules
- Entity Links, which define the SIP Trunks 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

- Session Manager Administration - Session Manager, corresponding to the Session
- Manager Server to be managed by System Manager
- Network Configuration
- Local Host Name Resolution - Local host name resolution entries corresponding to fully qualified domain names (FQDN's)
- SIP Firewall – Firewall configuration - Rules
- System Status - System State Administration

9.1 Set Up System Information

To do this, you will need to connect to the Avaya Aura Session Manager:

1. Connect LAN cable to Avaya Aura Session Manager Server
2. Set TCP/IP properties as follows:

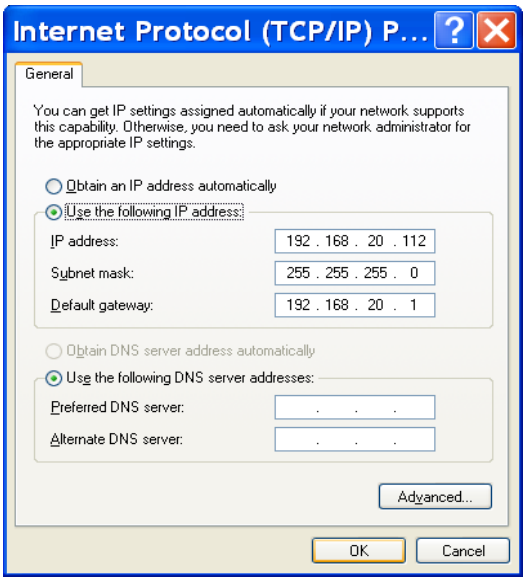


Figure 37 – IP Settings on your PC

3. Open a Web browser, and enter the following in the address bar: https://192.168.20.42/SMGR
4. Enter login information: (this is just an example, your administrator must provide you with the User name and Password)
   - Username: admin
   - Password: admin01

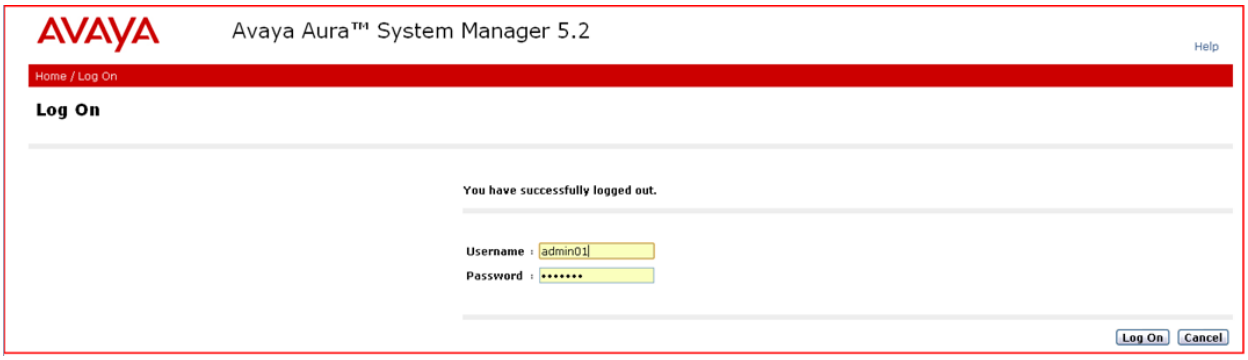


Figure 38 – Avaya Aura Login

5. Select the Session Manager tab.

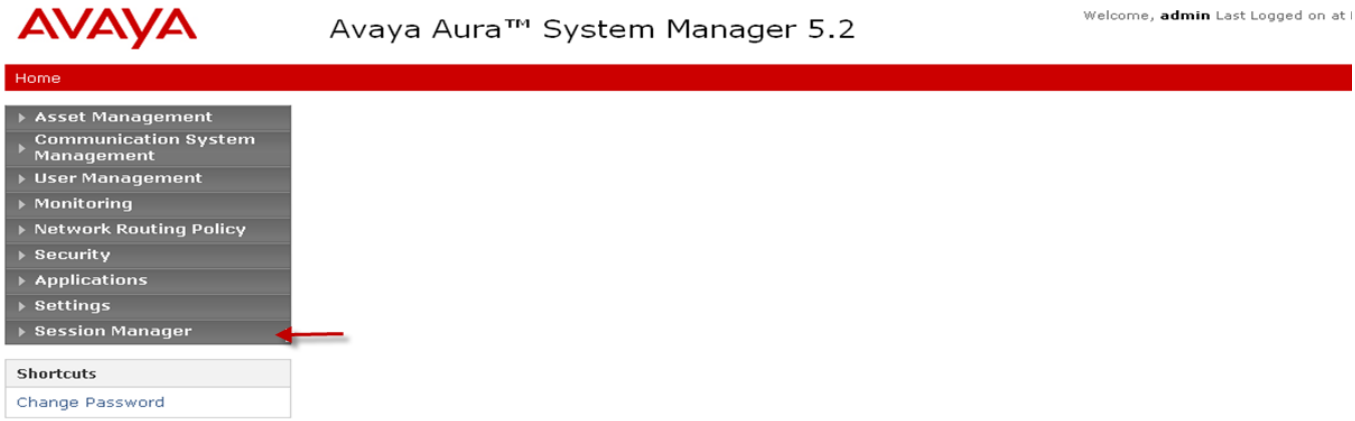


Figure 39 – Avaya Aura Session Manager Selection

6. Session Manager expanded view.

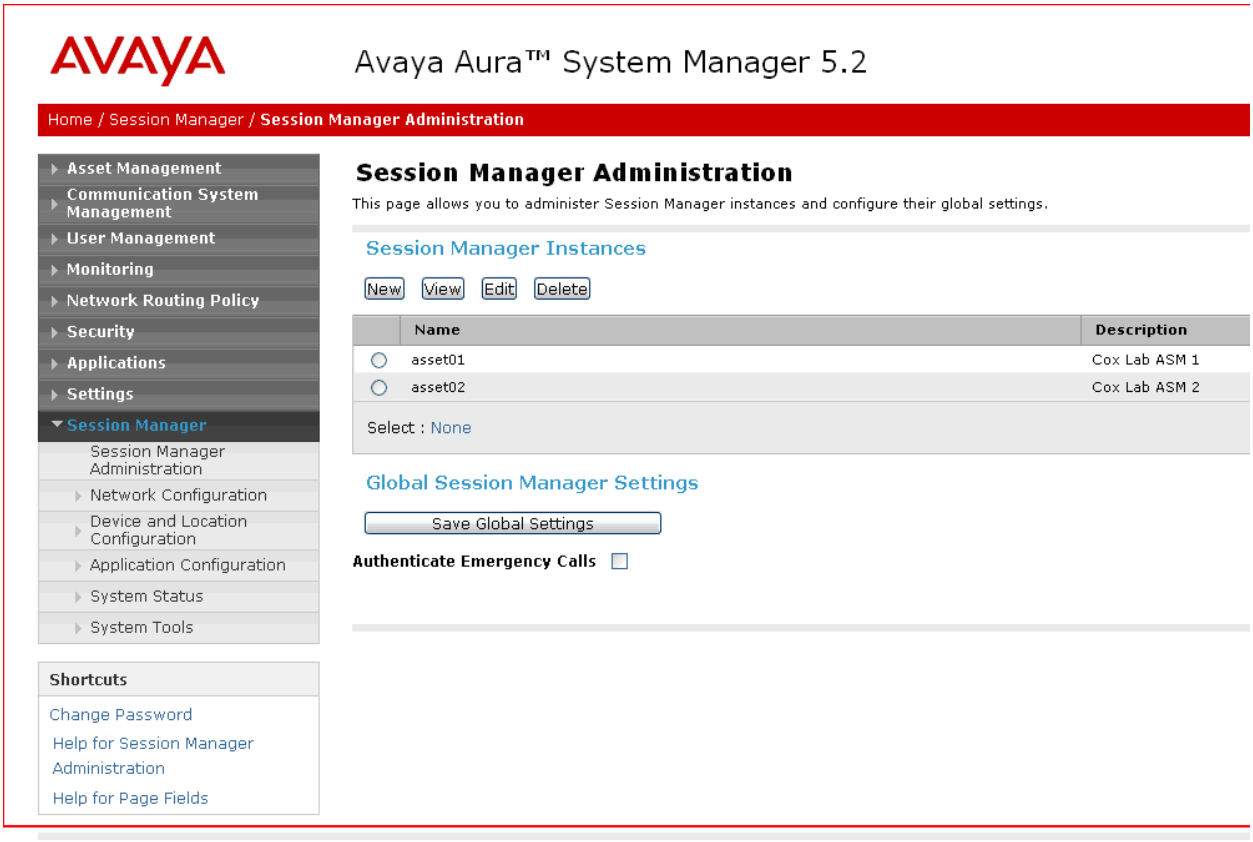


Figure 40 – Avaya Aura Session Manager Administration

7. By selecting one of the entry below, for example; asset01, you will be able to see all the detail configurations. Detail view of Session Manager ‘asset01’.

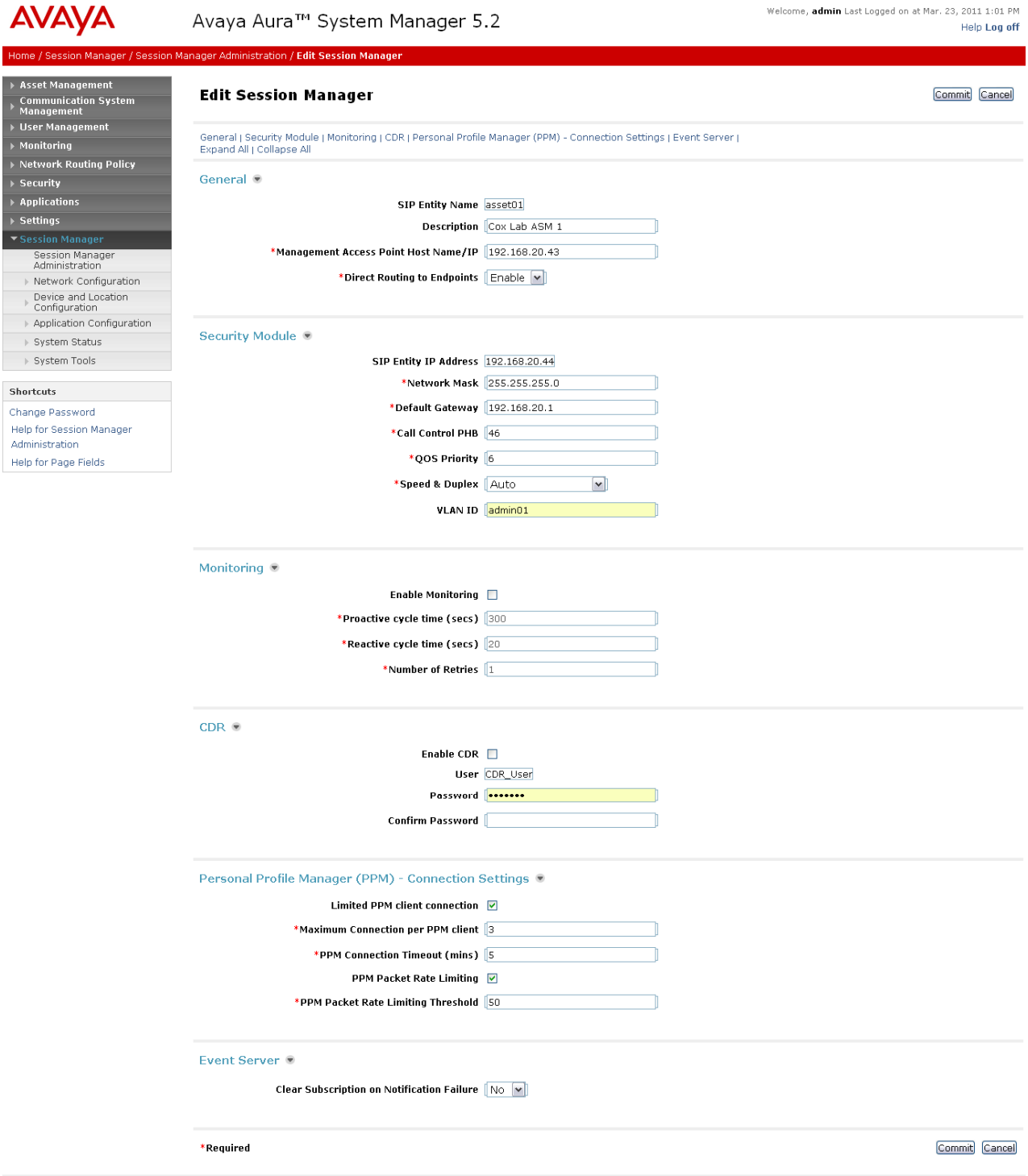


Figure 41 – View Session Manager

8. Local Host Name Resolution.

Local host name resolution entries corresponding to fully qualified domain names (FQDN's), in our lab we have two entries – s8510.clan with IP addresses of 192.168.20.52 and 192.168.20.53

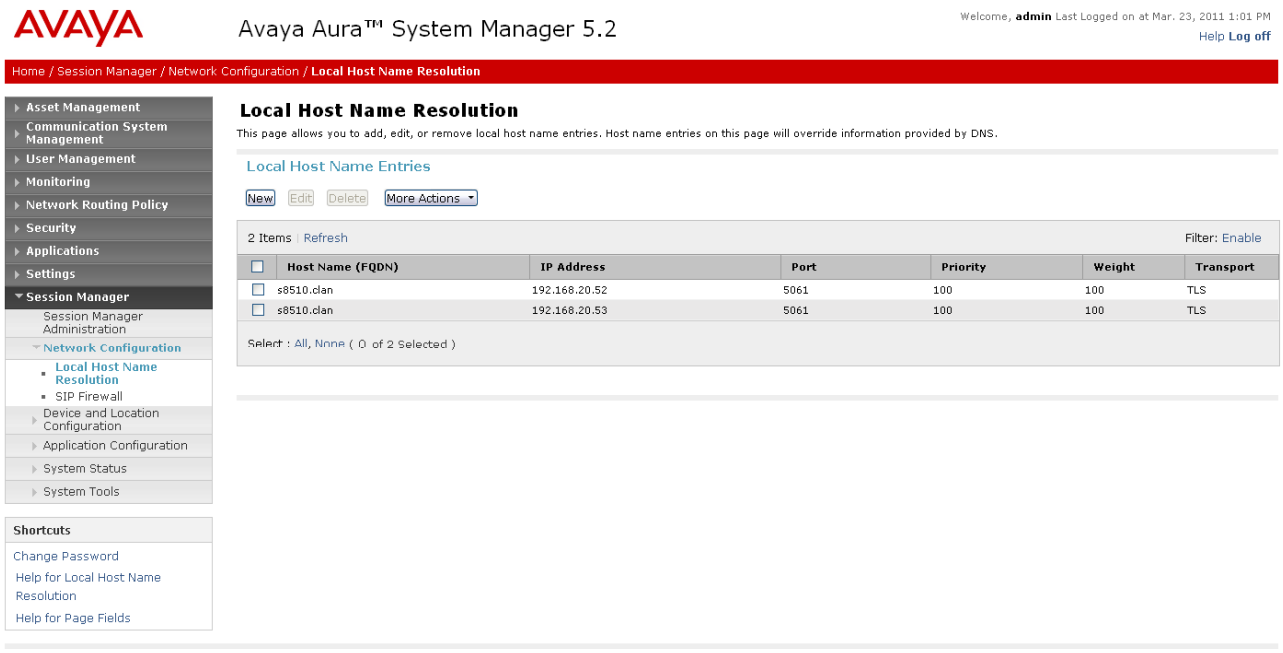


Figure 42 – Avaya Aura Local Host Name Resolution

9. Firewall Configuration.

In this section, we are selecting the Rules of rate limits base-by-base of all the conditions. Make sure that you select 'Enabled' per selection.

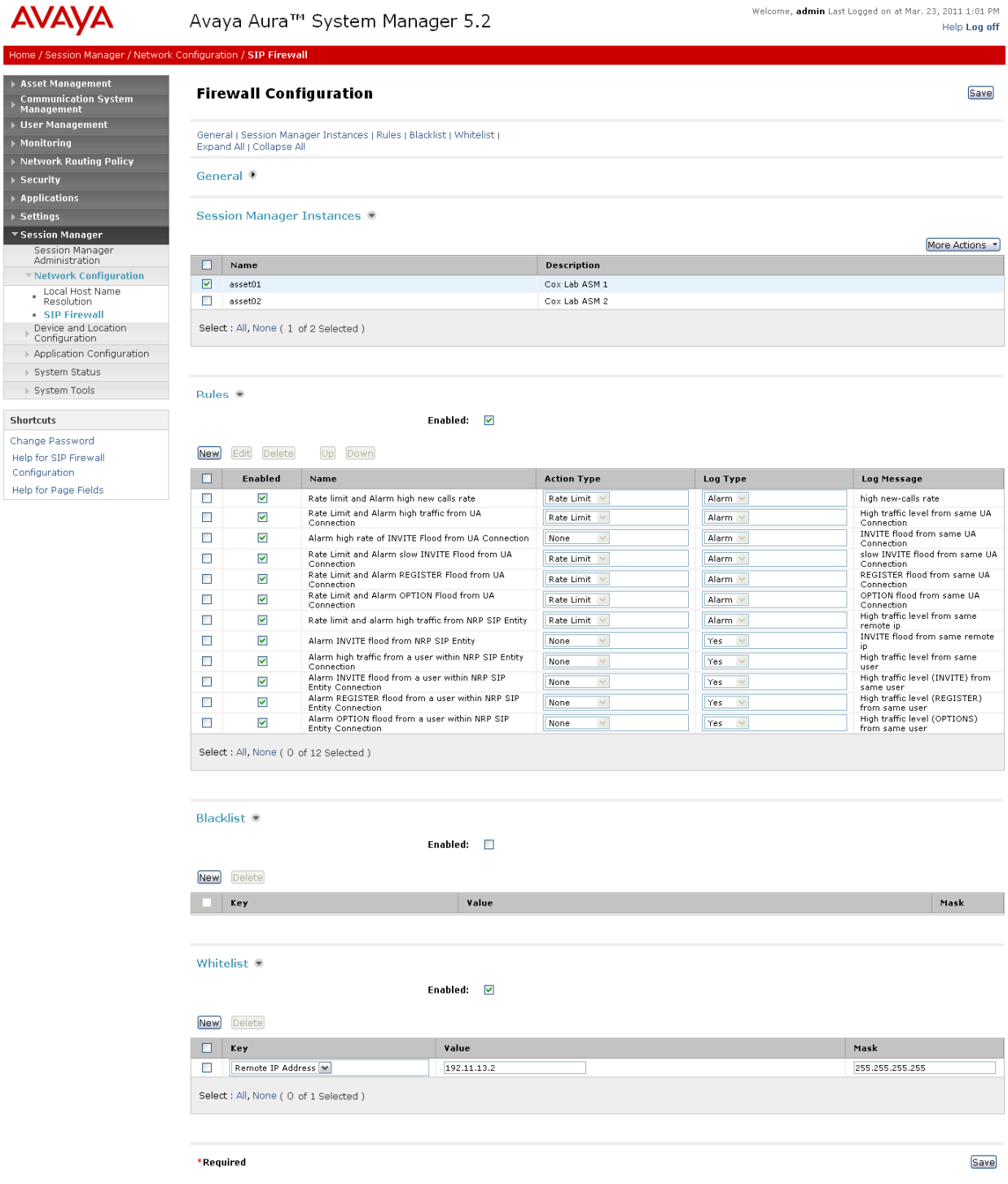


Figure 43 – Avaya Aura Firewall Configuration

9.2 Avaya Aura Session Manager with System Manager release 5.2. SP2 SIP Configuration Guide

9.2.1 Setup Network Routing Policy

The above screen show the overall step-by-step the required to setup the Network Routing Policy

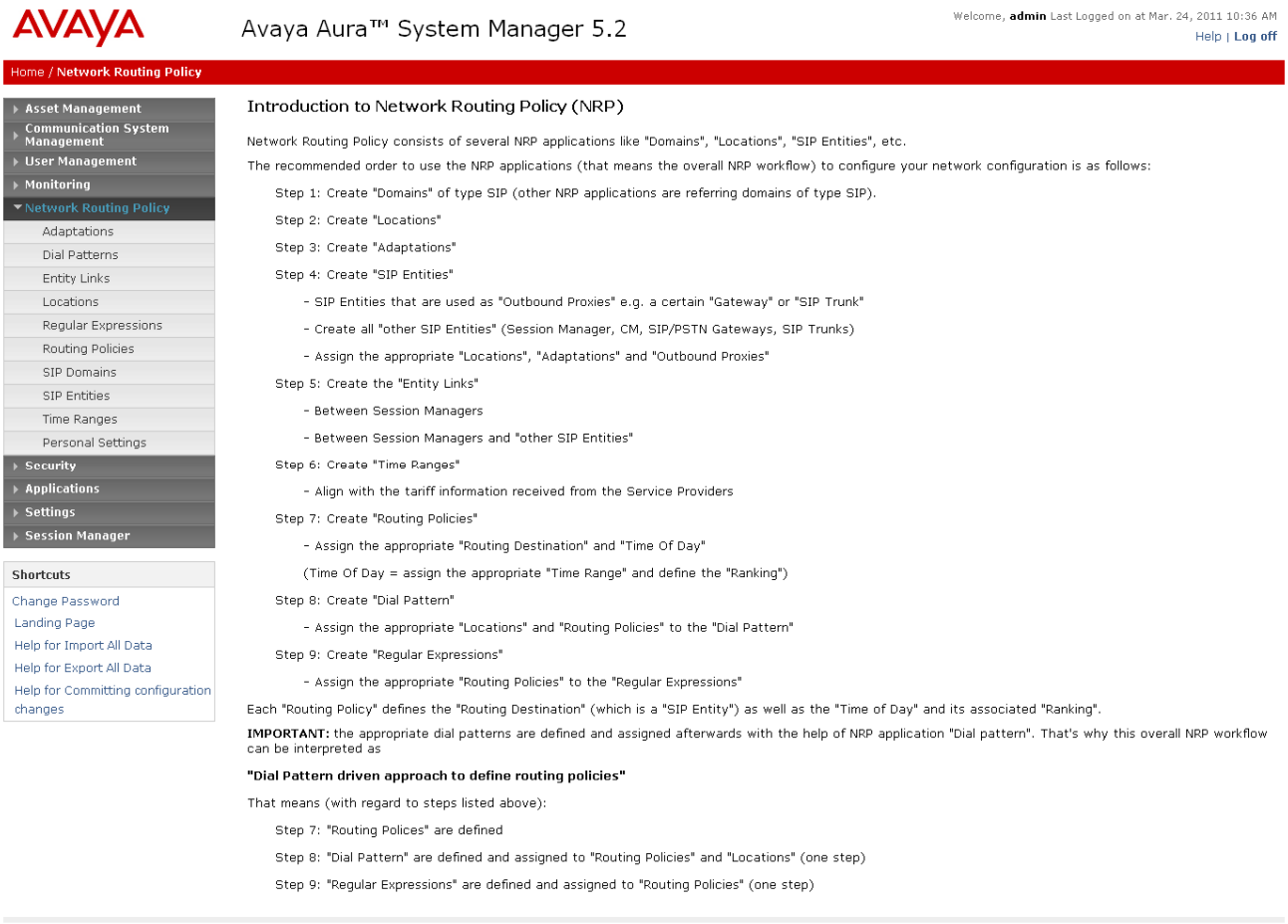


Figure 44 – Introduction to Network Routing Policy (NRP)

9.2.2 **Specify SIP Domain**

Add the SIP Domain for which the Session Manager and CS1K will be authoritative.

Select 'SIP Domains' on the left and click the New Button (not shown here) on the right. Fill in the following:

- **Name: The authoritative domain name (e.g., "avaya.com")**
- **Notes: Detail Description (optional)**

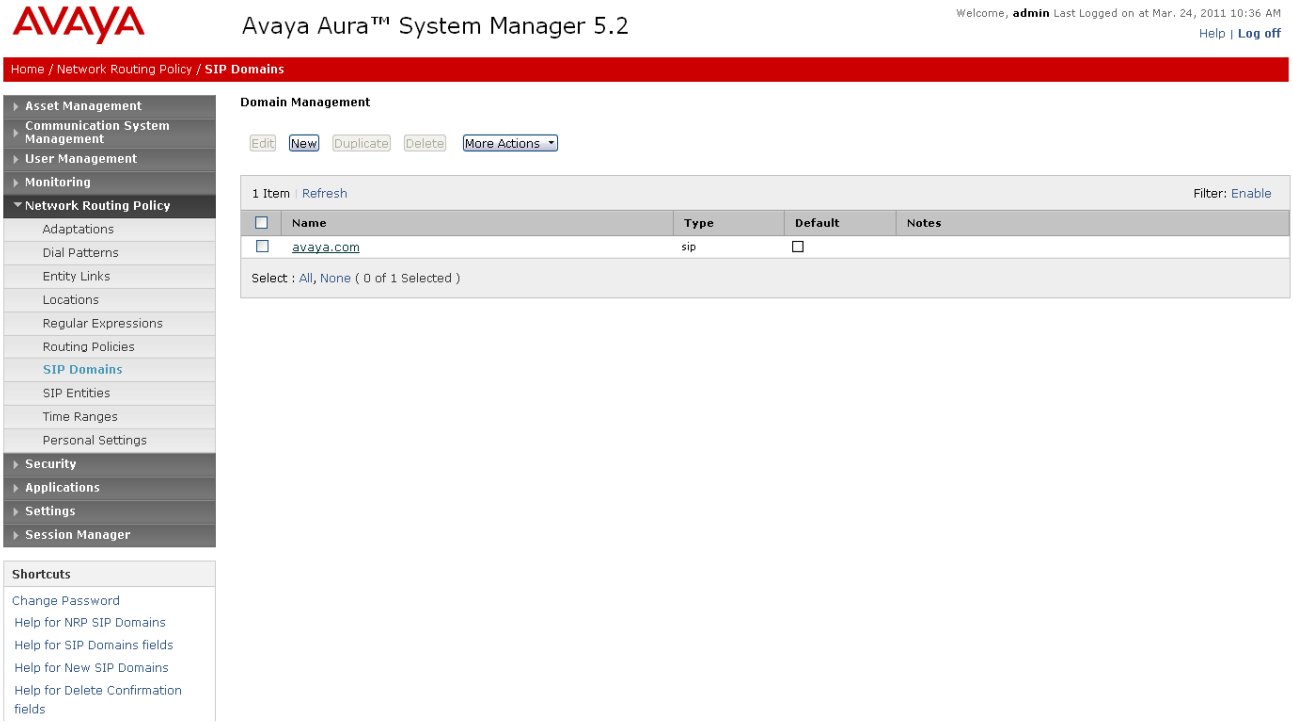


Figure 45 – SIP Domain

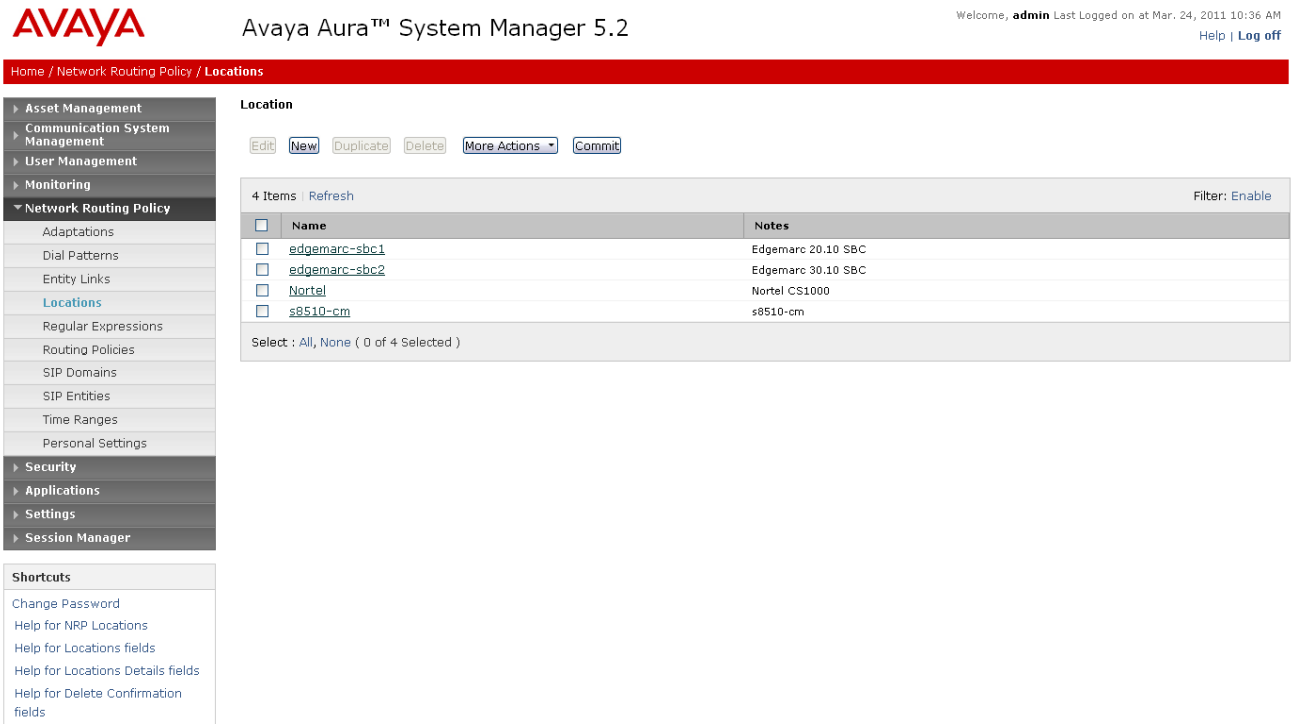
9.2.3 **Add Location**

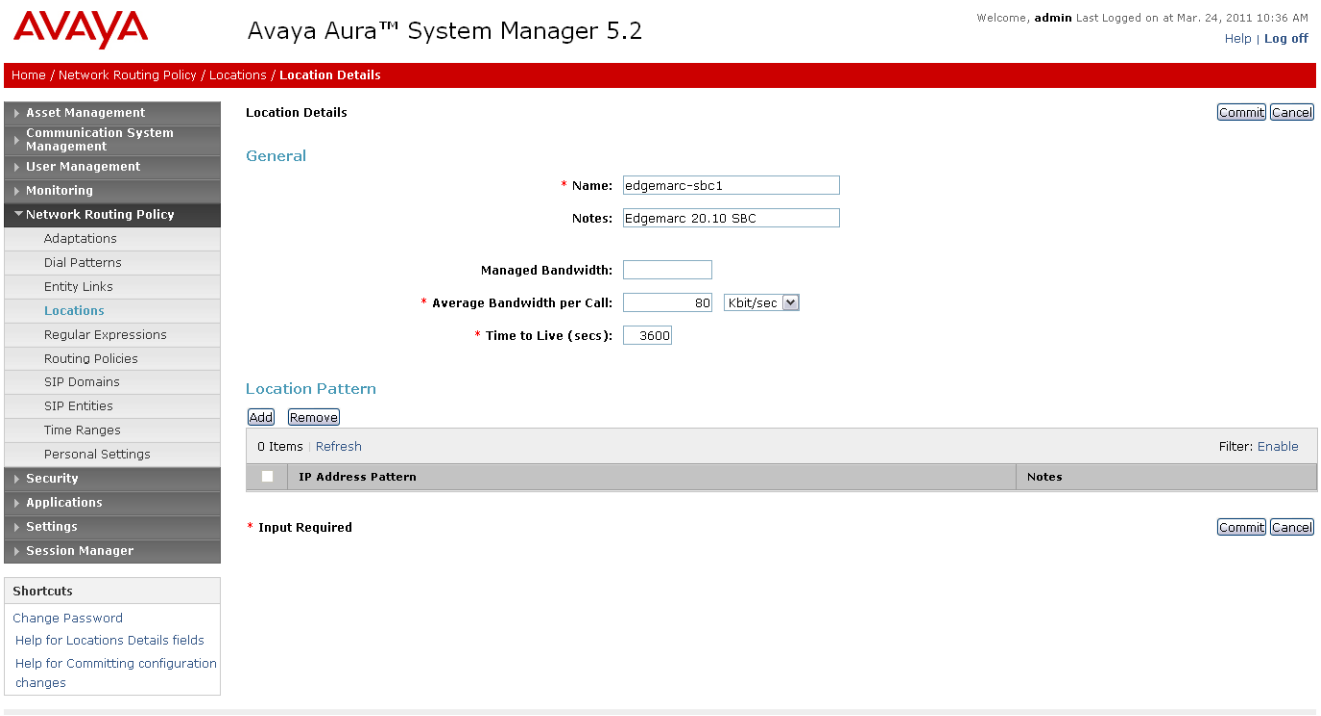
Locations are used to establish and discover logical and physical locations where SIP Entities reside for determination of bandwidth management and call admission control.

To add location, select '**Locations'** on the left and click on the '**New'** button on the right hand side. Under '**General'**, enter the following information:

- **Names: Nortel (A descriptive name)**
- **Notes: Description of the location (optional)**
- **Managed Bandwidth:**
- **Average Bandwidth per call: 80 kbit/sec**
- **Time to Live (secs): 3600**

Click **Commit** to save the location definition.


Avaya Aura™ System Manager 5.2
Welcome, admin Last Logged on at Mar. 24, 2011 10:36 AM
Help | Log off
Home / Network Routing Policy / Locations
Asset Management
Communication System Management
User Management
Monitoring
Network Routing Policy
Adaptations
Dial Patterns
Entity Links
Locations
Regular Expressions
Routing Policies
SIP Domains
SIP Entities
Time Ranges
Personal Settings
Security
Applications
Settings
Session Manager
Shortcuts
Change Password
Help for NRP Locations
Help for Locations fields
Help for Locations Details fields
Help for Delete Confirmation fields
Location
Edit New Duplicate Delete More Actions Commit
4 Items Refresh
Filter: Enable
Name
Notes
edgemarc-sbc1
Edgemarc 20.10 SBC
edgemarc-sbc2
Edgemarc 30.10 SBC
Nortel
Nortel CS1000
s8510-cm
s8510-cm
Select : All, None (0 of 4 Selected)


Avaya Aura™ System Manager 5.2
Welcome, admin Last Logged on at Mar. 24, 2011 10:36 AM
Help | Log off
Home / Network Routing Policy / Locations / Location Details
Asset Management
Communication System Management
User Management
Monitoring
Network Routing Policy
Adaptations
Dial Patterns
Entity Links
Locations
Regular Expressions
Routing Policies
SIP Domains
SIP Entities
Time Ranges
Personal Settings
Security
Applications
Settings
Session Manager
Shortcuts
Change Password
Help for Locations Details fields
Help for Committing configuration changes
Location Details
Commit Cancel
General
* Name: edgemarc-sbc1
Notes: Edgemarc 20.10 SBC
Managed Bandwidth:
* Average Bandwidth per Call: 80 Kbit/sec
* Time to Live (secs): 3600
Location Pattern
Add Remove
0 Items Refresh
Filter: Enable
IP Address Pattern
Notes
* Input Required
Commit Cancel

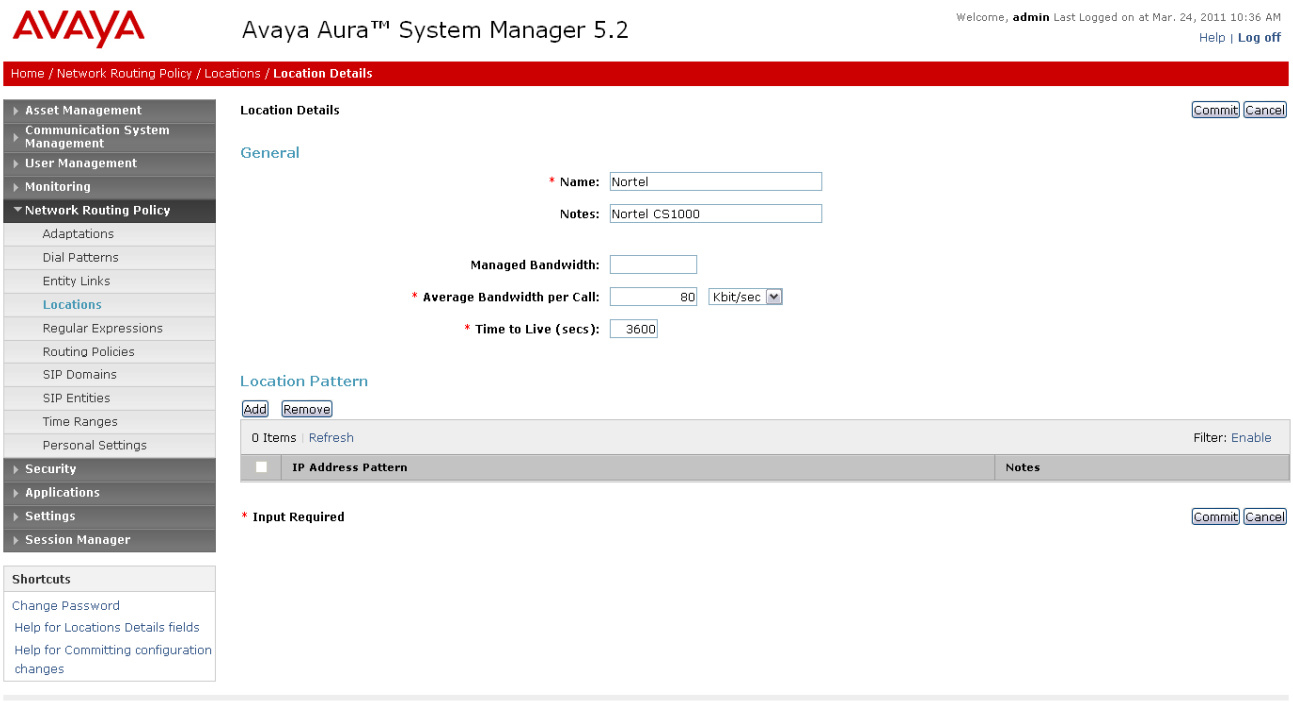


Figure 46 – Location section

9.2.4 Add Adaptations Modules

Avaya Session Manager Adaptations are used as a SIP Header Manipulation rule engine. Session Manager includes a module called "DigitConversionAdapter", which can convert digit strings in a SIP headers as well as hostnames in the Request-URI. As for as Cox concern, we have created two Adaptations Modules; one for the first EdgeMarc 6400lf E-SBC and the other for the second EdgeMarc 6400lf. The intended modules are use for Ingress domain and egress domain modification, where we override the domain with the IP Addresses of the EdgeMarc E-SBCs on the egress domain modification and override the IP Address with the domain 'avaya.com' on the ingress domain modification.

To add Adaptations Module, select '**Adaptations'** on the left and click on the '**New'** button on the right hand side. The Adaptation Details page is displayed.

- Enter the Name, Adaptation Module and any other required fields in the first section.
  - Enter a descriptive name
  - Specify an adaptation module.
    - '**Module name**' field contains only the name
    - '**Module parameter'** field contain either a single parameter or a list of **"name=value name=value name=value"**
  - Enter a list of URI parameters to append to the Request-URI on egress in the '**Egress URI Parameters'** field.

Click **Commit** to save the adaptation module.

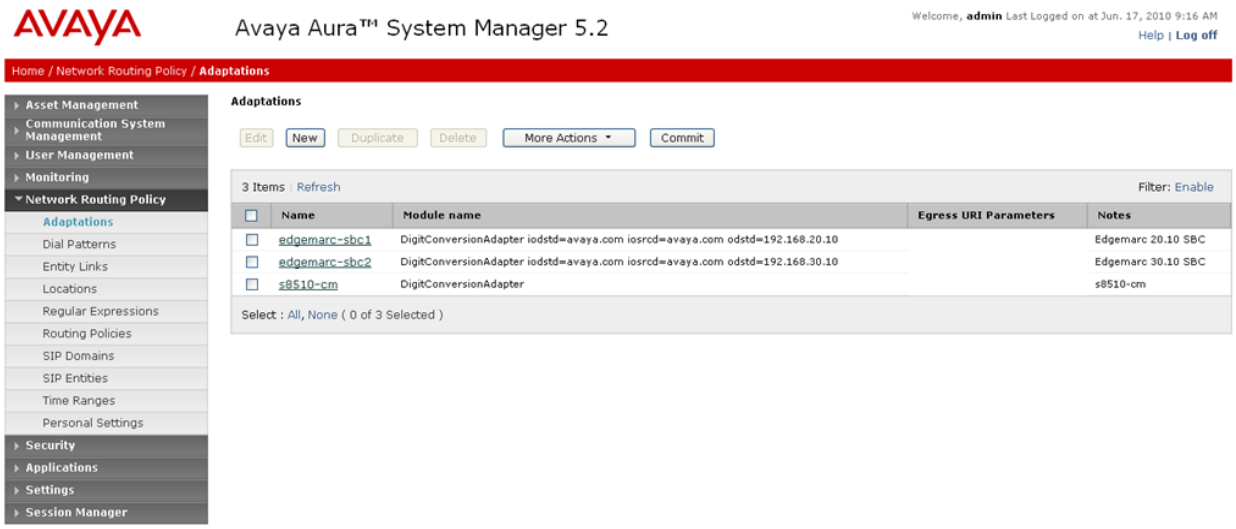


Figure 47 – Adaptations Module

As shown in the following Adaptation Detail, the INGRESS Domain Modification Parameters are overridden for both the ingressOverrideDestinationDomain (iodstd) and ingresOverrideSourceDomain (iosrcd) to 'avaya.com'. And we override EGRESS Domain Modification Parameters: overrideDestinationDomain with the IP Address of the EdgeMarc E-SBC '192.168.20.10'.

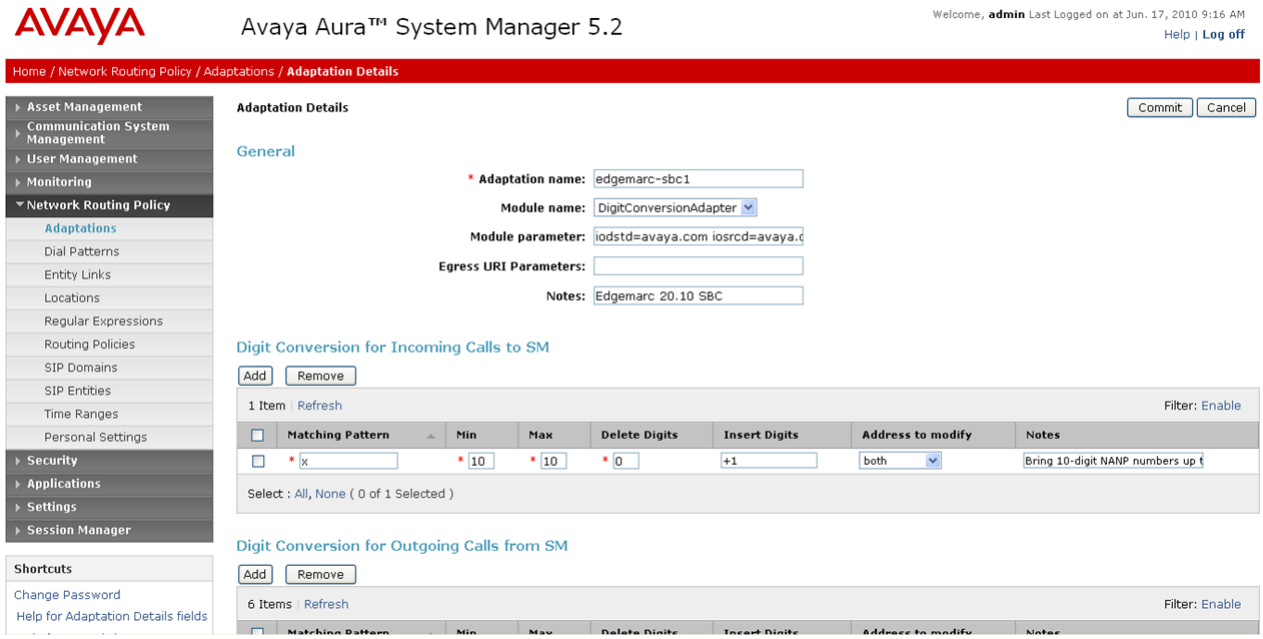


Figure 48 – Adaptation Module Detail

In following Digit Conversion screen for Incoming calls to Communication Manager, we inserted digits '+1" for all in coming calls, basically, we convert all incoming calls from National Numbering to E.164 format before presenting to Avaya Communication Manager. And for the Digit Conversion of Outgoing Calls from the Communication Manager revert the process by either deleting the first digit (+) or first two digits (+1) before presenting to the EdgeMarc E-SBCs.

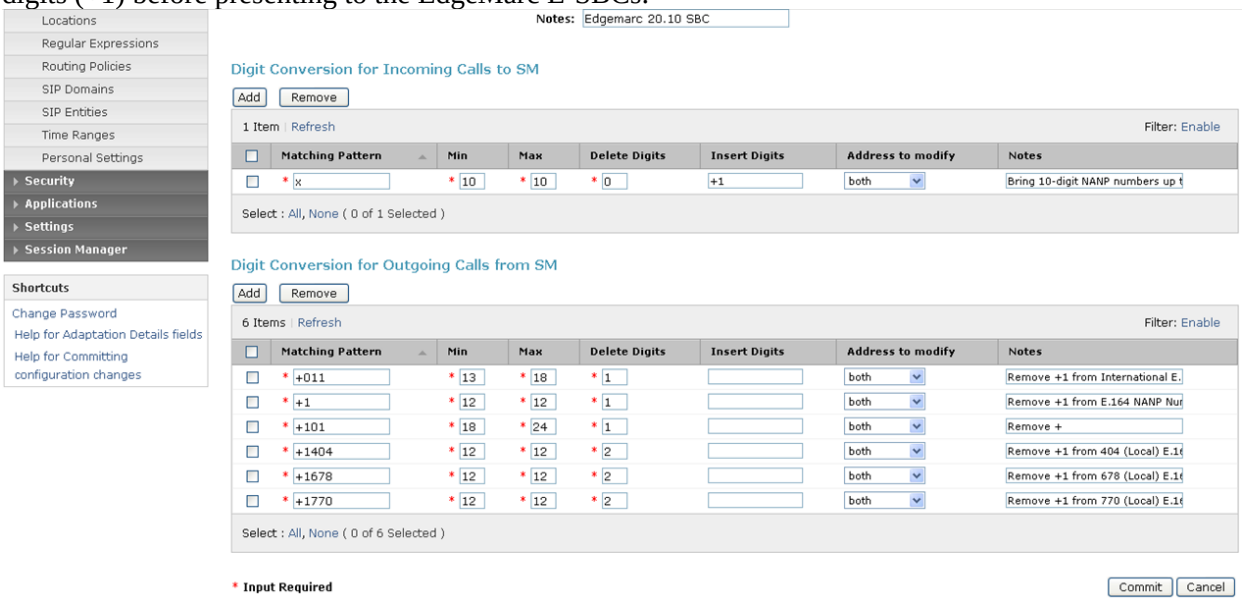


Figure 49 – Adaptation Module – Digit Conversion

9.2.5 Add SIP Entities

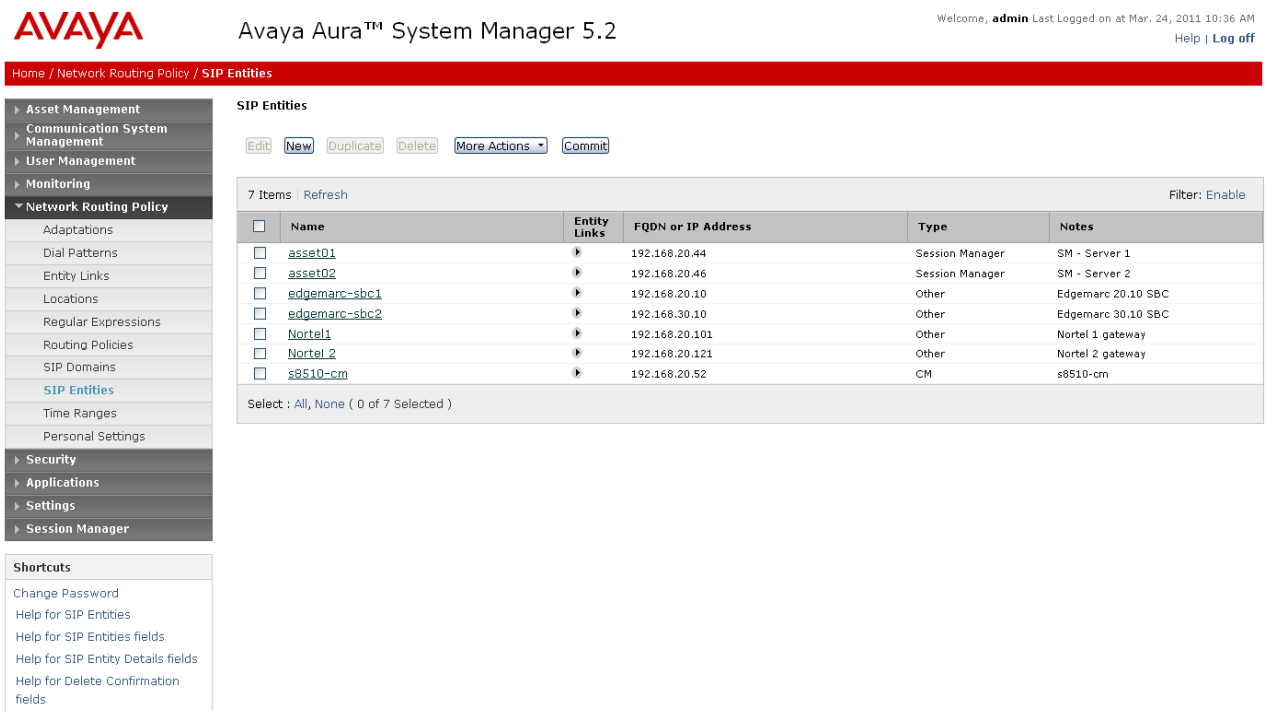
A SIP Entity must be added for each of the Session Manager (for our example, there is two asset01 and asset02) and for each entity system supported by it using SIP Trunks. In our lab sample configuration, this would include the EdgeMarc E-SBC and Avaya/Nortel CS1K.

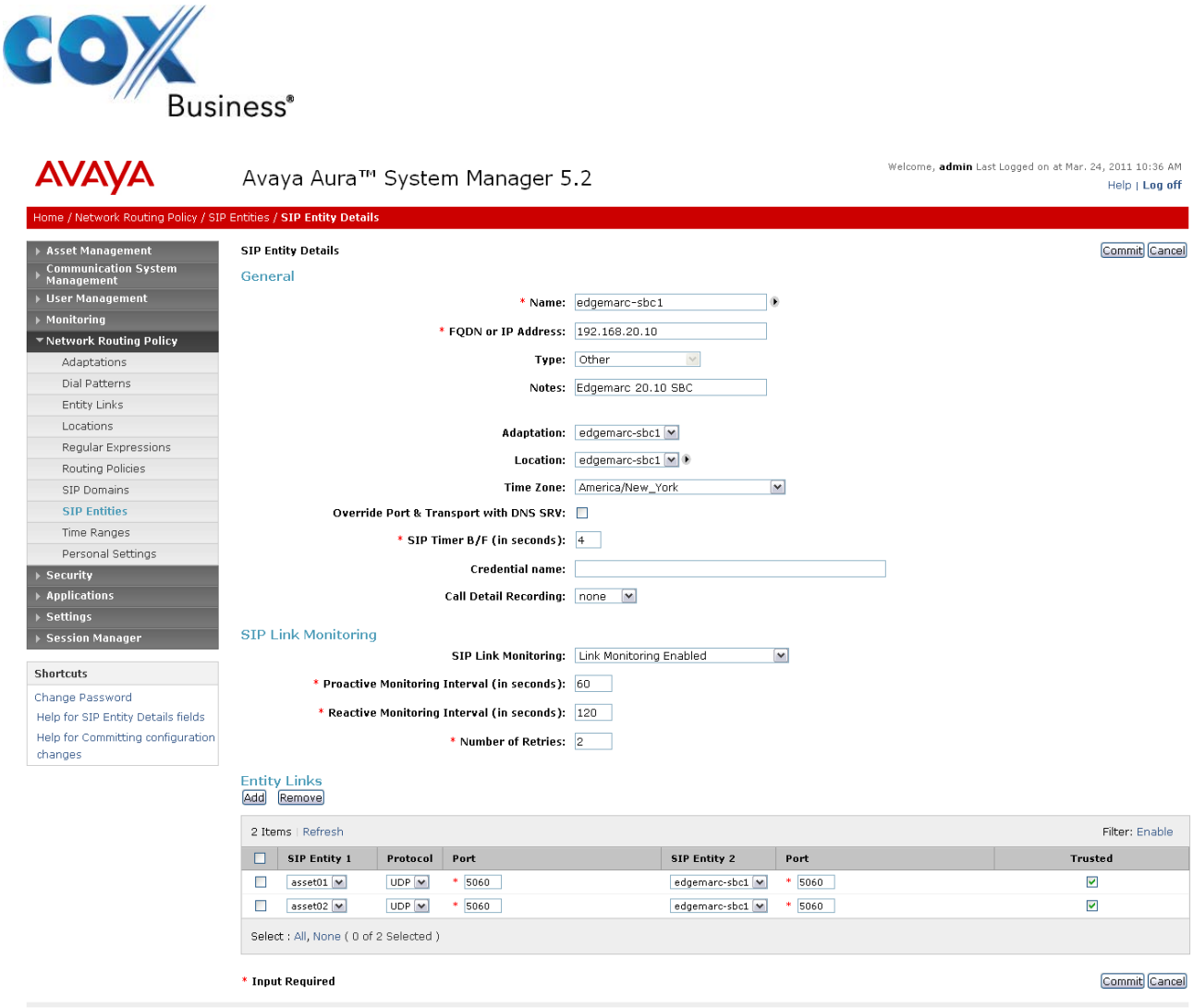
Select '**SIP Entities'** on the left and click on the **New** button on the right. Under ***General***, fill in the following:

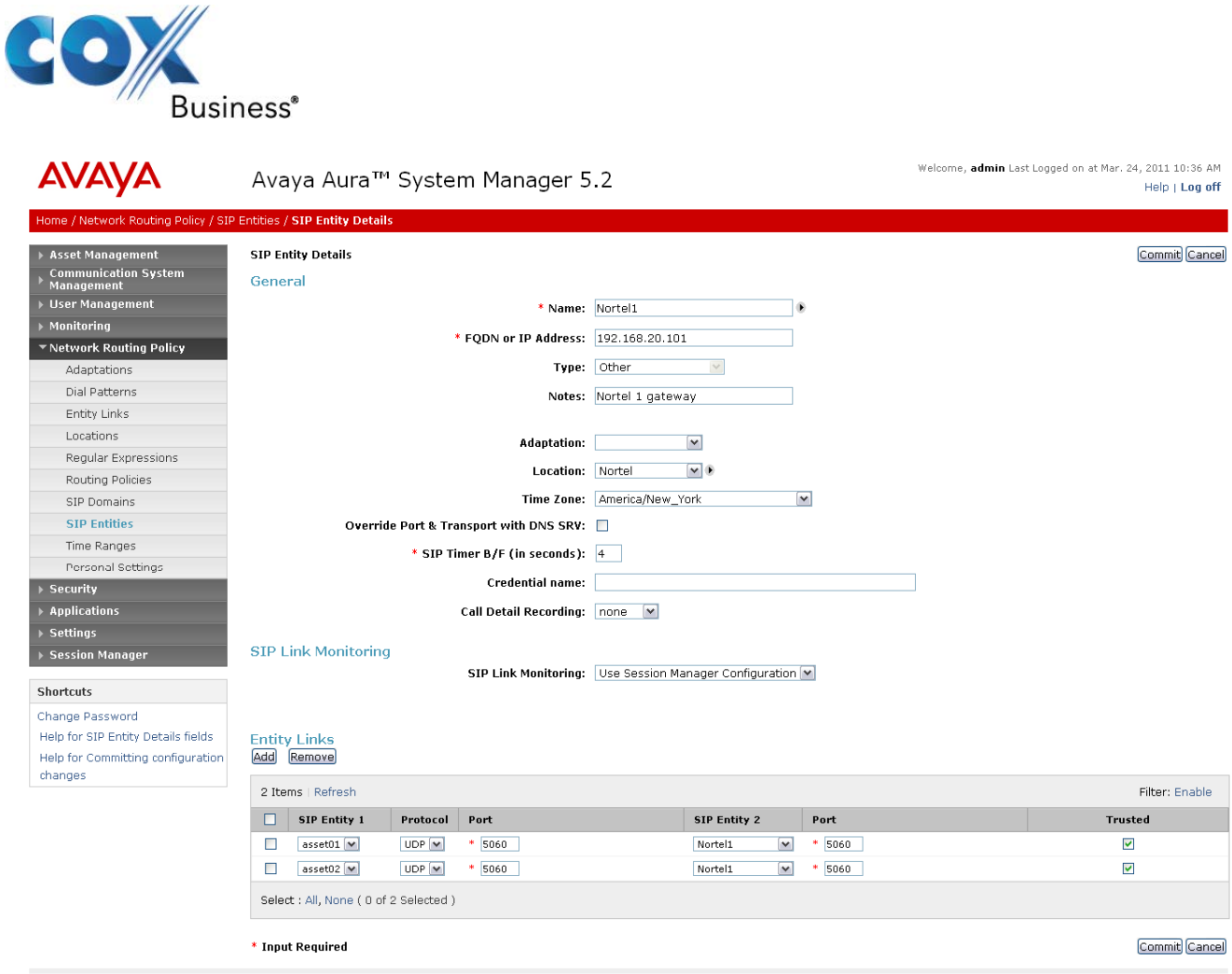
- **Name**: Name description
- **FQDN or IP Address**: FQDN or IP Address of the Session Manager or the SIP signaling interface of the E-SBC and CS1000 telephony system
- **Type**: "Session Manager" for Session Manager or "Other" for both E-SBC and CS1000.
- **Location**: Select one of the locations defined previously.
- **Time Zone**: Time zone of the location.

Under Port, click **Add**, and then edit the fields in the resulting new row as show:

- **Port**: '**5060'** Port number on which the system listens for SIP Requests. The default value is **5060**
- **Protocol**: '**UDP'** Transport protocol to be used to send SIP requests.
- **Default Domain:** "**avaya.com**" The domain used for the enterprise.




Avaya Aura™ System Manager 5.2
Welcome, admin Last Logged on at Mar. 24, 2011 10:36 AM
Help | Log off
Home / Network Routing Policy / SIP Entities / SIP Entity Details
Asset Management
Communication System Management
User Management
Monitoring
Network Routing Policy
Adaptations
Dial Patterns
Entity Links
Locations
Regular Expressions
Routing Policies
SIP Domains
SIP Entities
Time Ranges
Personal Settings
Security
Applications
Settings
Session Manager
Shortcuts
Change Password
Help for SIP Entity Details fields
Help for Committing configuration changes
SIP Entity Details
Commit
Cancel
General
* Name: edgemarc-sbc1
* FQDN or IP Address: 192.168.20.10
Type: Other
Notes: Edgemarc 20.10 SBC
Adaptation: edgemarc-sbc1
Location: edgemarc-sbc1
Time Zone: America/New_York
Override Port & Transport with DNS SRV:
* SIP Timer B/F (in seconds): 4
Credential name:
Call Detail Recording: none
SIP Link Monitoring
SIP Link Monitoring: Link Monitoring Enabled
* Proactive Monitoring Interval (in seconds): 60
* Reactive Monitoring Interval (in seconds): 120
* Number of Retries: 2
Entity Links
Add
Remove
2 Items | Refresh
Filter: Enable
SIP Entity 1
Protocol
Port
SIP Entity 2
Port
Trusted
asset01
UDP
* 5060
edgemarc-sbc1
* 5060
asset02
UDP
* 5060
edgemarc-sbc1
* 5060
Select : All, None (0 of 2 Selected)
* Input Required
Commit
Cancel


Avaya Aura™ System Manager 5.2
Welcome, admin Last Logged on at Mar. 24, 2011 10:36 AM
Help | Log off
Home / Network Routing Policy / SIP Entities / SIP Entity Details
Asset Management
Communication System Management
User Management
Monitoring
Network Routing Policy
Adaptations
Dial Patterns
Entity Links
Locations
Regular Expressions
Routing Policies
SIP Domains
SIP Entities
Time Ranges
Personal Settings
Security
Applications
Settings
Session Manager
Shortcuts
Change Password
Help for SIP Entity Details fields
Help for Committing configuration changes
SIP Entity Details
Commit
Cancel
General
* Name: Nortel1
* FQDN or IP Address: 192.168.20.101
Type: Other
Notes: Nortel 1 gateway
Adaptation:
Location: Nortel
Time Zone: America/New_York
Override Port & Transport with DNS SRV:
* SIP Timer B/F (in seconds): 4
Credential name:
Call Detail Recording: none
SIP Link Monitoring
SIP Link Monitoring: Use Session Manager Configuration
Entity Links
Add
Remove
2 Items Refresh
Filter: Enable
SIP Entity 1
Protocol
Port
SIP Entity 2
Port
Trusted
asset01
UDP
5060
Nortel1
5060
asset02
UDP
5060
Nortel1
5060
Select : All, None (0 of 2 Selected)
* Input Required
Commit
Cancel

Avaya Aura™ System Manager 5.2

Welcome, **admin** Last Logged on at Mar. 24, 2011 10:36 AM
Help | **Log off**

Home / Network Routing Policy / SIP Entities / **SIP Entity Details**

- Asset Management
- Communication System Management
- User Management
- Monitoring
- Network Routing Policy
  - Adaptations
  - Dial Patterns
  - Entity Links
  - Locations
  - Regular Expressions
  - Routing Policies
  - SIP Domains
  - SIP Entities
  - Time Ranges
  - Personal Settings
- Security
- Applications
- Settings
- Session Manager

Shortcuts

- Change Password
- Help for SIP Entity Details fields
- Help for Committing configuration changes

SIP Entity Details Commit Cancel

General

* **Name:**	asset01
* **FQDN or IP Address:**	192.168.20.44
Type:	Session Manager
Notes:	SM - Server 1
Location:	
Outbound Proxy:	
Time Zone:	America/New_York
Credential name:	

SIP Link Monitoring

SIP Link Monitoring:	Link Monitoring Enabled
* **Proactive Monitoring Interval (in seconds):**	900
* **Reactive Monitoring Interval (in seconds):**	120
* **Number of Retries:**	1

Entity Links

Add Remove

5 Items | Refresh Filter: Enable

	SIP Entity 1	Protocol	Port	SIP Entity 2	Port	Trusted
☐	asset01	UDP	* 5060	edgemarc-sbc2	* 5060	☑
☐	asset01	UDP	* 5060	Nortel 2	* 5060	☑
☐	asset01	UDP	* 5060	Nortel1	* 5060	☑
☐	asset01	UDP	* 5060	edgemarc-sbc1	* 5060	☑
☐	asset01	TLS	* 5061	s8510-cm	* 5061	☑

Select : All, None (0 of 5 Selected)

Port

Add Remove

3 Items | Refresh Filter: Enable

	Port	Protocol	Default Domain	Notes
☐	5060	TCP	avaya.com	
☐	5060	UDP	avaya.com	
☐	5061	TLS	avaya.com	

Select : All, None (0 of 3 Selected)

* **Input Required** Commit Cancel

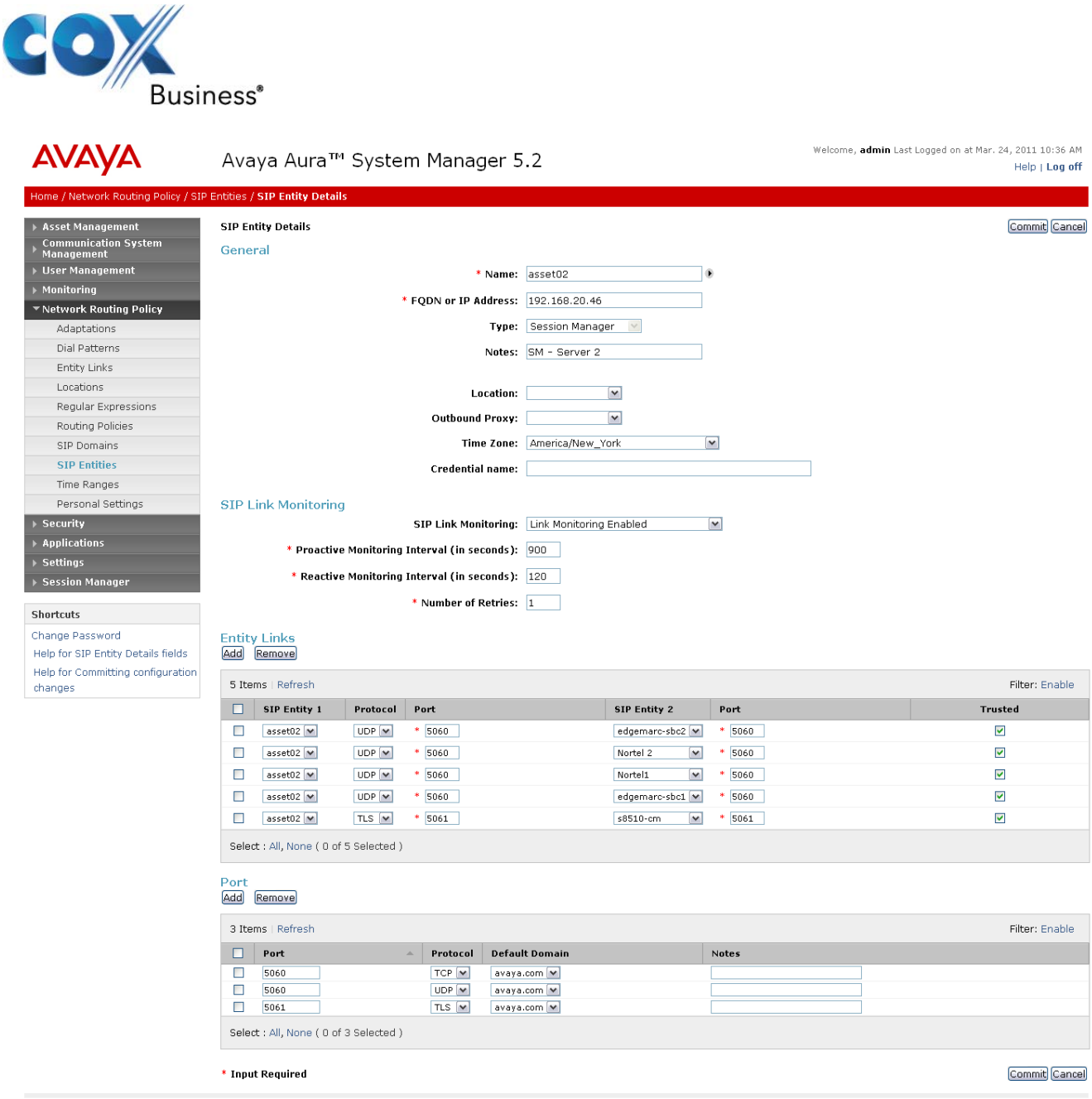


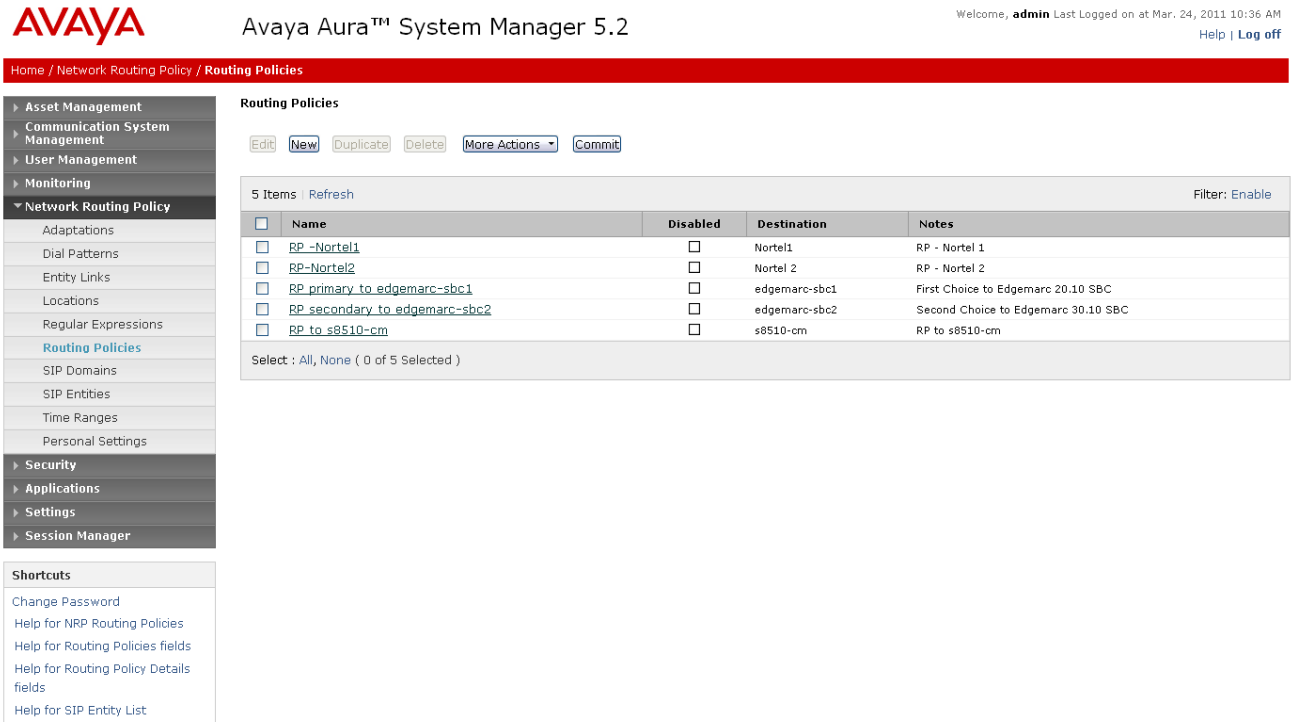
Figure 50 – SIP Entities

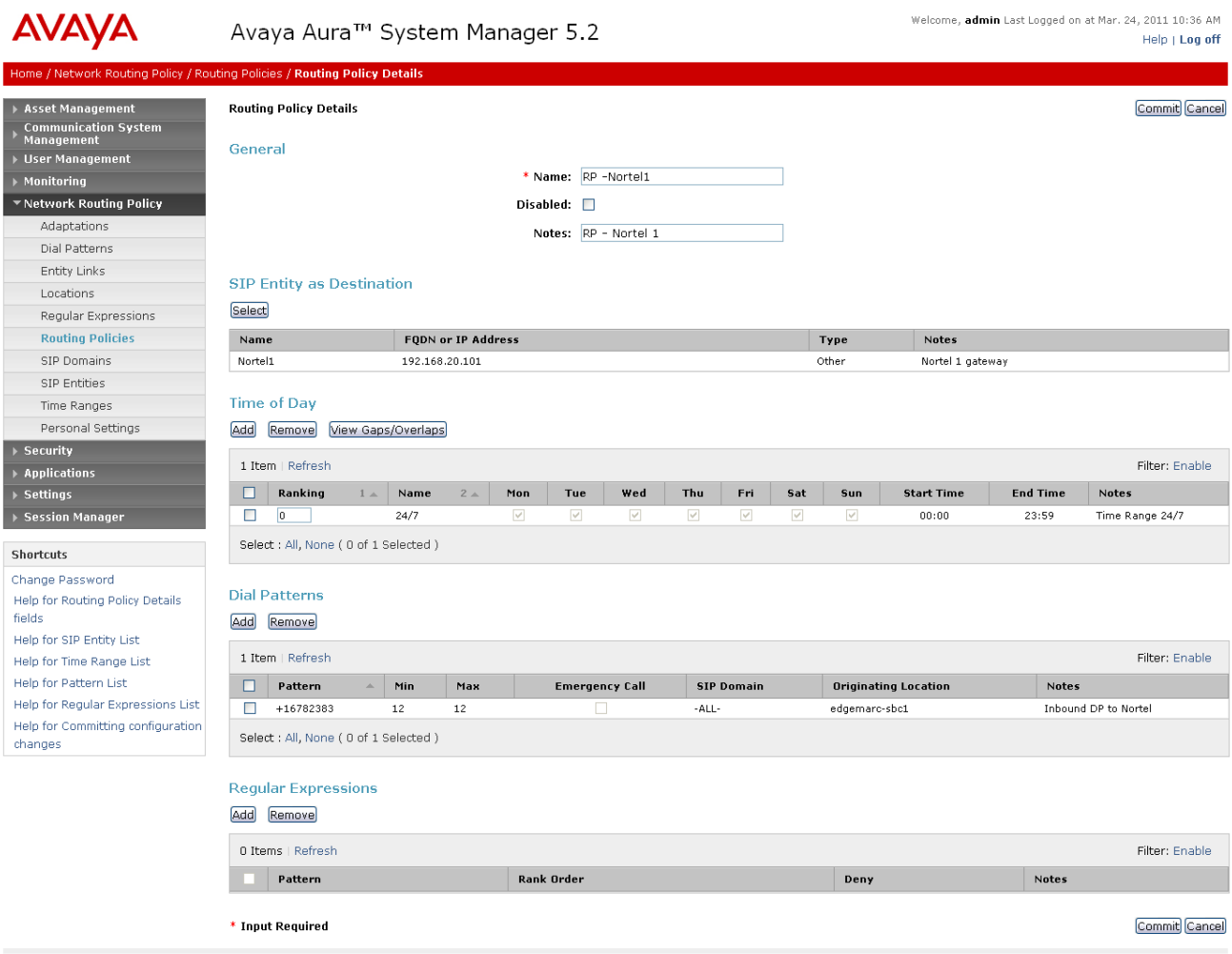
9.2.6 Add Routing Policies

Routing Policies describe the situations which calls will be routed to the SIP Entities specified as shown above. A routing policy must be added for Nortel CS1000 and EdgeMarc E-SBC. To add a routing policy, simply select '**Routing Policies'** on the left and click on the **New** button on the right. Fill in the following:

- Under **General**:
  Enter a descriptive name in the **Name** field.
- Under **SIP Entity** as Destination:
  Click **Select**, and then choice the appropriate SIP Entity to which this routing policy applies.
- Under **Time of Day**:
  Select the default time range shown.

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




AVAYA
Avaya Aura™ System Manager 5.2
Welcome, admin Last Logged on at Mar. 24, 2011 10:36 AM
Help | Log off
Home / Network Routing Policy / Routing Policies / Routing Policy Details
Asset Management
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User Management
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Shortcuts
Change Password
Help for Routing Policy Details fields
Help for SIP Entity List
Help for Time Range List
Help for Pattern List
Help for Regular Expressions List
Help for Committing configuration changes
Routing Policy Details
Commit Cancel
General
* Name: RP -Nortel1
Disabled:
Notes: RP - Nortel 1
SIP Entity as Destination
Select
Name FQDN or IP Address Type Notes
Nortel1 192.168.20.101 Other Nortel 1 gateway
Time of Day
Add Remove View Gaps/Overlaps
1 Item Refresh Filter: Enable
Ranking Name Mon Tue Wed Thu Fri Sat Sun Start Time End Time Notes
0 24/7 00:00 23:59 Time Range 24/7
Select : All, None (0 of 1 Selected)
Dial Patterns
Add Remove
1 Item Refresh Filter: Enable
Pattern Min Max Emergency Call SIP Domain Originating Location Notes
+16782383 12 12 -ALL- edgemarc-sbc1 Inbound DP to Nortel
Select : All, None (0 of 1 Selected)
Regular Expressions
Add Remove
0 Items Refresh Filter: Enable
Pattern Rank Order Deny Notes
* Input Required
Commit Cancel

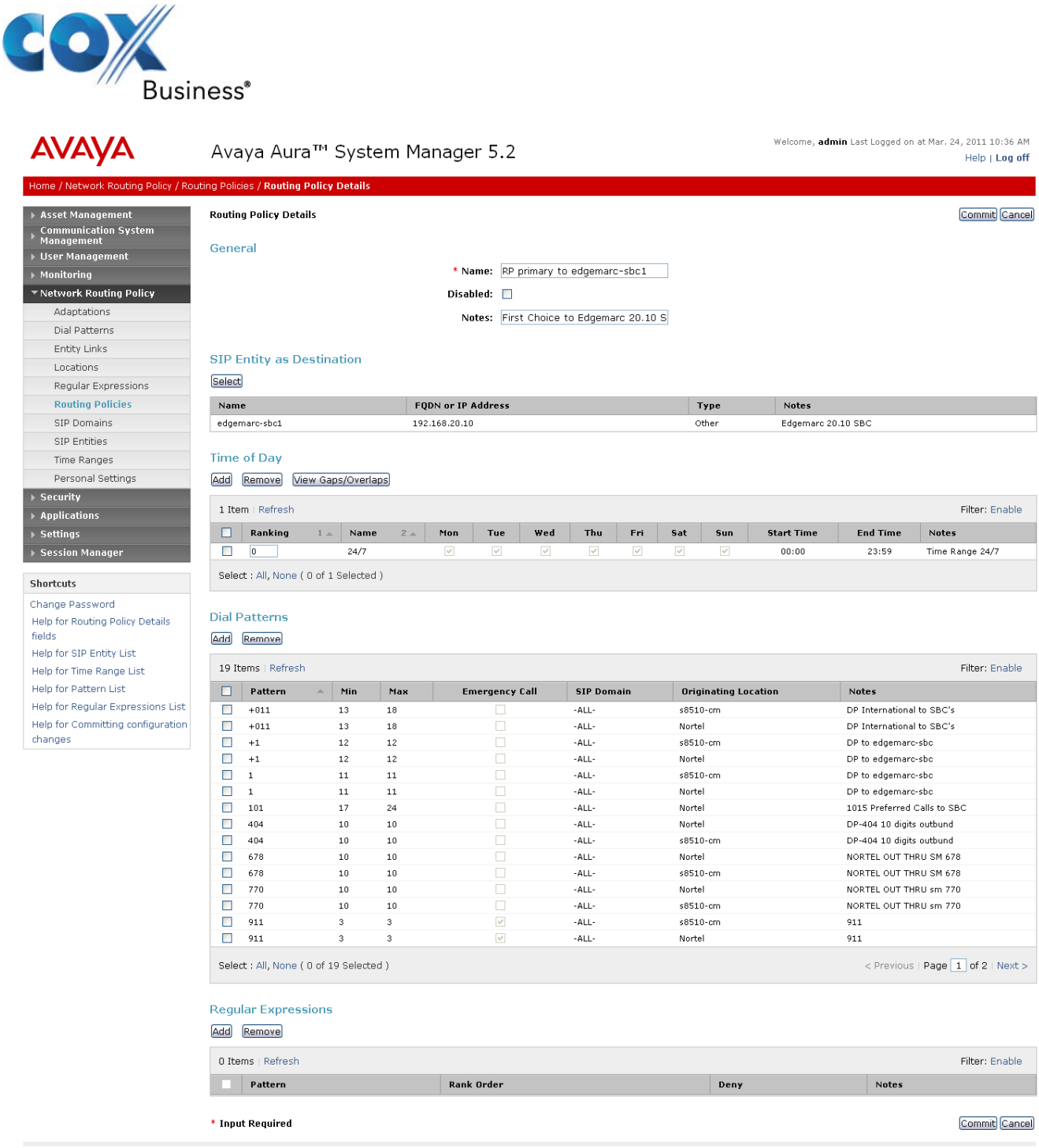


Figure 51 – Routing Policies

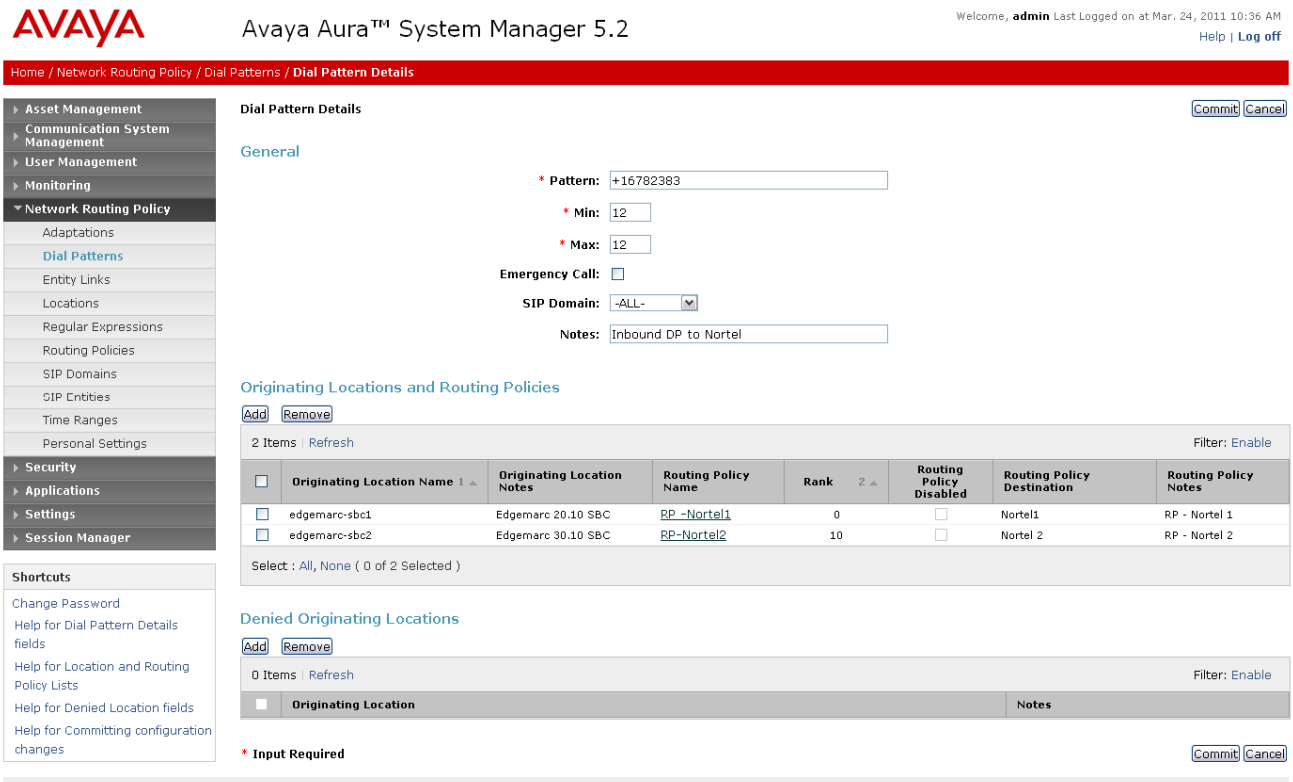
9.2.7 Add Dial Patterns

Here we will define dial patterns to direct ingress and egress calls to the appropriate SIP Entity. Call begins with 1678283 should be routed to CS1000. And anything that begins with 1 or +1 should be routed to EdgeMarc E-SBC as shown above. To add a dial pattern, select '**Dial Patterns'** on the left and click on the **New** Button on the right and fill in the following fields:

Under **General**:

- **Pattern:** Dialed number or prefix.
- **Min:** Minimum length of dialed number
- **Max:** Maximum length of dialed number
- **SIP Domain:** SIP domain specified below section
- **Notes:** Comment or detail description

Under **Originating Locations and Routing Policies**:
Click **Add**, and then select location and routing policy from the list.
Default values can be used for the remaining fields. Click **Summit** to save each dial pattern.



Avaya Aura™ System Manager 5.2

Welcome, **admin** Last Logged on at Mar. 24, 2011 10:36 AM
Help | **Log off**

Home / Network Routing Policy / Dial Patterns / **Dial Pattern Details**

- Asset Management
- Communication System Management
- User Management
- Monitoring
- Network Routing Policy
  - Adaptations
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  - Locations
  - Regular Expressions
  - Routing Policies
  - SIP Domains
  - SIP Entities
  - Time Ranges
  - Personal Settings
- Security
- Applications
- Settings
- Session Manager

Shortcuts

- Change Password
- Help for Dial Pattern Details fields
- Help for Location and Routing Policy Lists
- Help for Denied Location fields
- Help for Committing configuration changes

Dial Pattern Details Commit Cancel

General

* **Pattern:** 678
* **Min:** 10
* **Max:** 10
Emergency Call:
SIP Domain: -ALL-
Notes: NORTEL OUT THRU SM 678

Originating Locations and Routing Policies

Add Remove

4 Items | Refresh Filter: Enable

Originating Location Name 1	Originating Location Notes	Routing Policy Name	Rank 2	Routing Policy Disabled	Routing Policy Destination	Routing Policy Notes
Nortel	Nortel CS1000	RP primary to edgemarc-sbc1	0		edgemarc-sbc1	First Choice to Edgemarc 20.10 SBC
Nortel	Nortel CS1000	RP secondary to edgemarc-sbc2	10		edgemarc-sbc2	Second Choice to Edgemarc 30.10 SBC
s8510-cm	s8510-cm	RP primary to edgemarc-sbc1	0		edgemarc-sbc1	First Choice to Edgemarc 20.10 SBC
s8510-cm	s8510-cm	RP secondary to edgemarc-sbc2	10		edgemarc-sbc2	Second Choice to Edgemarc 30.10 SBC

Select : All, None (0 of 4 Selected)

Denied Originating Locations

Add Remove

0 Items | Refresh Filter: Enable

Originating Location	Notes

* **Input Required** Commit Cancel

Avaya Aura™ System Manager 5.2

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Help | **Log off**

Home / Network Routing Policy / Dial Patterns / **Dial Pattern Details**

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- Communication System Management
- User Management
- Monitoring
- Network Routing Policy
  - Adaptations
  - Dial Patterns
  - Entity Links
  - Locations
  - Regular Expressions
  - Routing Policies
  - SIP Domains
  - SIP Entities
  - Time Ranges
  - Personal Settings
- Security
- Applications
- Settings
- Session Manager

Shortcuts

- Change Password
- Help for Dial Pattern Details fields
- Help for Location and Routing Policy Lists
- Help for Denied Location fields
- Help for Committing configuration changes

Dial Pattern Details Commit Cancel

General

* **Pattern:** +011
* **Min:** 13
* **Max:** 18
Emergency Call:
SIP Domain: -ALL-
Notes: DP International to SBC's

Originating Locations and Routing Policies

Add Remove

4 Items | Refresh Filter: Enable

	Originating Location Name 1	Originating Location Notes	Routing Policy Name	Rank 2	Routing Policy Disabled	Routing Policy Destination	Routing Policy Notes
	Nortel	Nortel CS1000	RP primary to edgemarc-sbc1	0		edgemarc-sbc1	First Choice to Edgemarc 20.10 SBC
	Nortel	Nortel CS1000	RP secondary to edgemarc-sbc2	10		edgemarc-sbc2	Second Choice to Edgemarc 30.10 SBC
	s8510-cm	s8510-cm	RP primary to edgemarc-sbc1	0		edgemarc-sbc1	First Choice to Edgemarc 20.10 SBC
	s8510-cm	s8510-cm	RP secondary to edgemarc-sbc2	10		edgemarc-sbc2	Second Choice to Edgemarc 30.10 SBC

Select : All, None (0 of 4 Selected)

Denied Originating Locations

Add Remove

0 Items | Refresh Filter: Enable

	Originating Location	Notes

* **Input Required**

Commit Cancel

Avaya Aura™ System Manager 5.2

Welcome, **admin** Last Logged on at Mar. 24, 2011 10:36 AM
Help | **Log off**

Home / Network Routing Policy / Dial Patterns / **Dial Pattern Details**

- Asset Management
- Communication System Management
- User Management
- Monitoring
- Network Routing Policy
  - Adaptations
  - Dial Patterns
  - Entity Links
  - Locations
  - Regular Expressions
  - Routing Policies
  - SIP Domains
  - SIP Entities
  - Time Ranges
  - Personal Settings
- Security
- Applications
- Settings
- Session Manager

Shortcuts

- Change Password
- Help for Dial Pattern Details fields
- Help for Location and Routing Policy Lists
- Help for Denied Location fields
- Help for Committing configuration changes

Dial Pattern Details Commit Cancel

General

* **Pattern:** 1
* **Min:** 11
* **Max:** 11
Emergency Call:
SIP Domain: -ALL-
Notes: DP to edgemarc-sbc

Originating Locations and Routing Policies

Add Remove

4 Items | Refresh Filter: Enable

	Originating Location Name 1	Originating Location Notes	Routing Policy Name	Rank 2	Routing Policy Disabled	Routing Policy Destination	Routing Policy Notes
	Nortel	Nortel CS1000	RP primary to edgemarc-sbc1	0		edgemarc-sbc1	First Choice to Edgemarc 20.10 SBC
	Nortel	Nortel CS1000	RP secondary to edgemarc-sbc2	10		edgemarc-sbc2	Second Choice to Edgemarc 30.10 SBC
	s8510-cm	s8510-cm	RP primary to edgemarc-sbc1	0		edgemarc-sbc1	First Choice to Edgemarc 20.10 SBC
	s8510-cm	s8510-cm	RP secondary to edgemarc-sbc2	10		edgemarc-sbc2	Second Choice to Edgemarc 30.10 SBC

Select : All, None (0 of 4 Selected)

Denied Originating Locations

Add Remove

0 Items | Refresh Filter: Enable

	Originating Location	Notes

* **Input Required** Commit Cancel

Avaya Aura™ System Manager 5.2

Welcome, **admin** Last Logged on at Mar. 24, 2011 10:36 AM
Help | **Log off**

Home / Network Routing Policy / Dial Patterns / **Dial Pattern Details**

- Asset Management
- Communication System Management
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- Monitoring
- Network Routing Policy
  - Adaptations
  - Dial Patterns
  - Entity Links
  - Locations
  - Regular Expressions
  - Routing Policies
  - SIP Domains
  - SIP Entities
  - Time Ranges
  - Personal Settings
- Security
- Applications
- Settings
- Session Manager

Shortcuts

- Change Password
- Help for Dial Pattern Details fields
- Help for Location and Routing Policy Lists
- Help for Denied Location fields
- Help for Committing configuration changes

Dial Pattern Details Commit Cancel

General

* **Pattern:** +1
* **Min:** 12
* **Max:** 12
Emergency Call:
SIP Domain: -ALL-
Notes: DP to edgemarc-sbc

Originating Locations and Routing Policies

Add Remove

4 Items | Refresh Filter: Enable

	Originating Location Name 1	Originating Location Notes	Routing Policy Name	Rank 2	Routing Policy Disabled	Routing Policy Destination	Routing Policy Notes
	Nortel	Nortel CS1000	RP primary to edgemarc-sbc1	0		edgemarc-sbc1	First Choice to Edgemarc 20.10 SBC
	Nortel	Nortel CS1000	RP secondary to edgemarc-sbc2	10		edgemarc-sbc2	Second Choice to Edgemarc 30.10 SBC
	s8510-cm	s8510-cm	RP primary to edgemarc-sbc1	0		edgemarc-sbc1	First Choice to Edgemarc 20.10 SBC
	s8510-cm	s8510-cm	RP secondary to edgemarc-sbc2	10		edgemarc-sbc2	Second Choice to Edgemarc 30.10 SBC

Select : All, None (0 of 4 Selected)

Denied Originating Locations

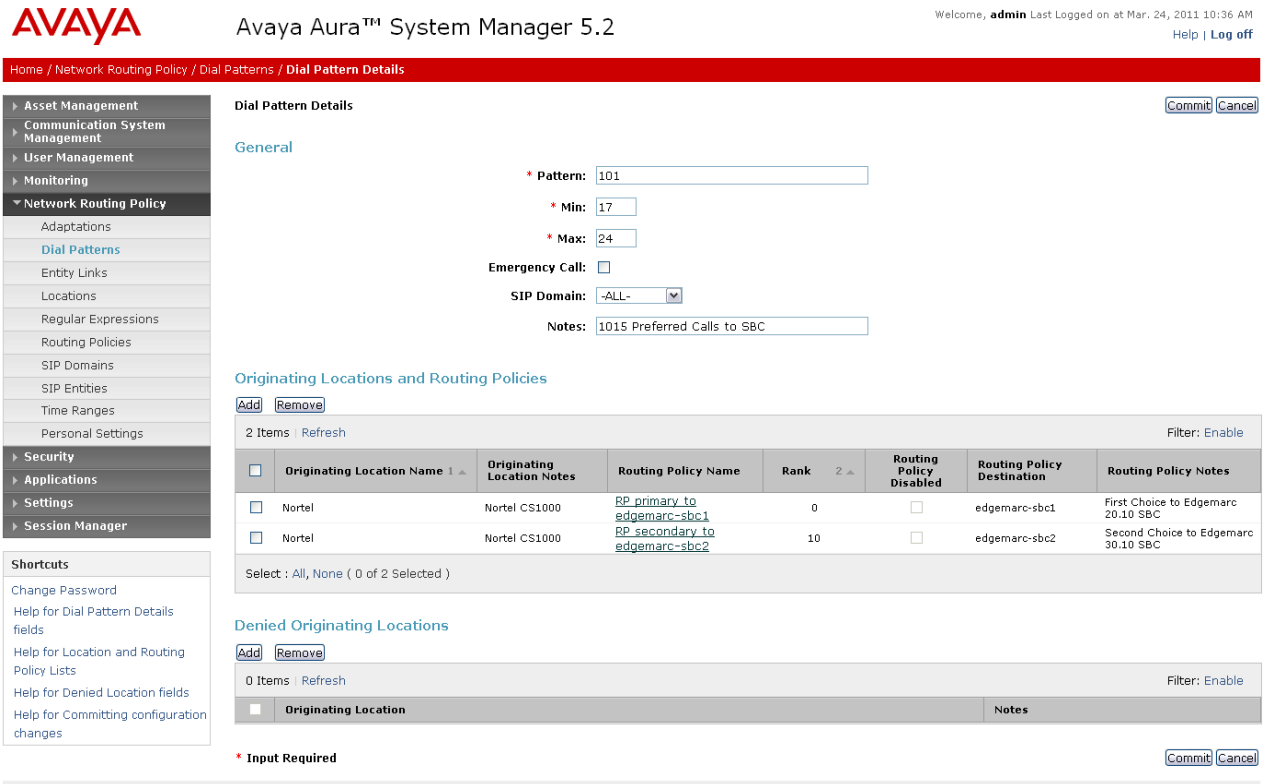
Add Remove

0 Items | Refresh Filter: Enable

	Originating Location	Notes

* **Input Required**

Commit Cancel


AVAYA
Avaya Aura™ System Manager 5.2
Welcome, admin Last Logged on at Mar. 24, 2011 10:36 AM
Help | Log off
Home / Network Routing Policy / Dial Patterns / Dial Pattern Details
Asset Management
Communication System Management
User Management
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Network Routing Policy
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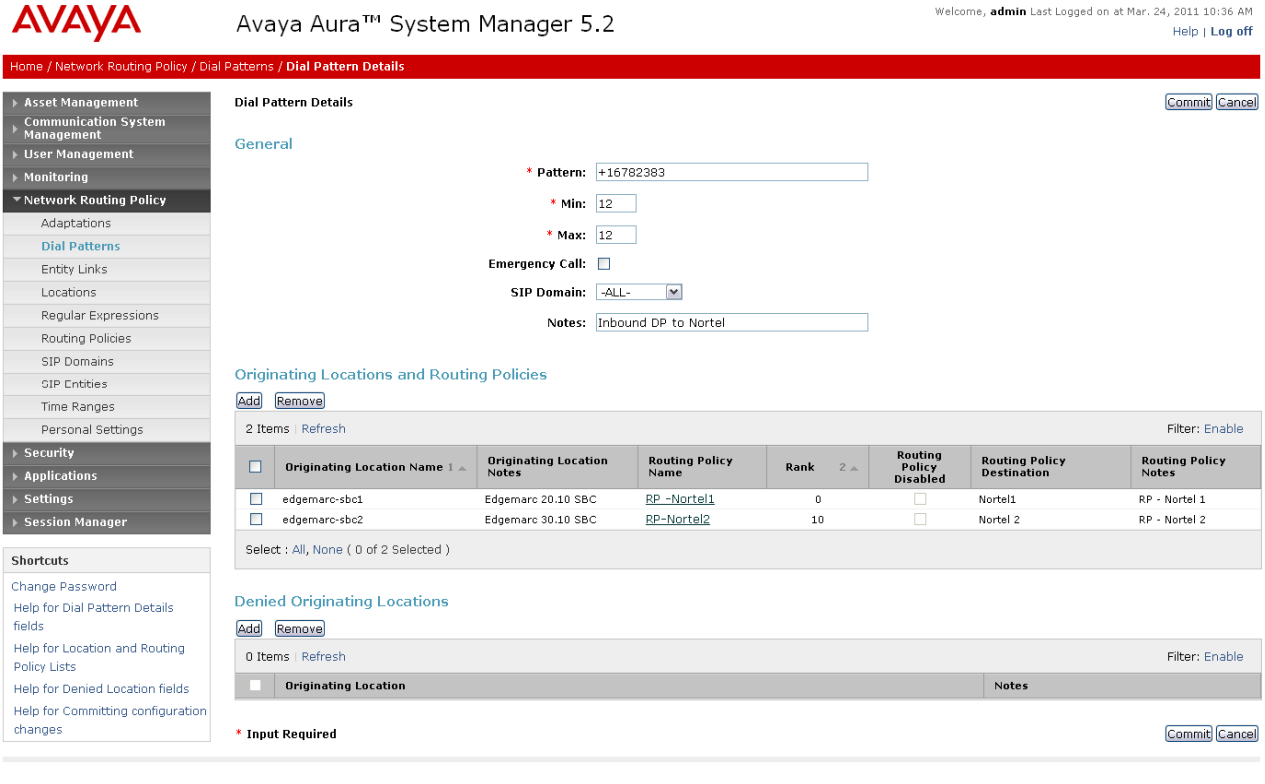
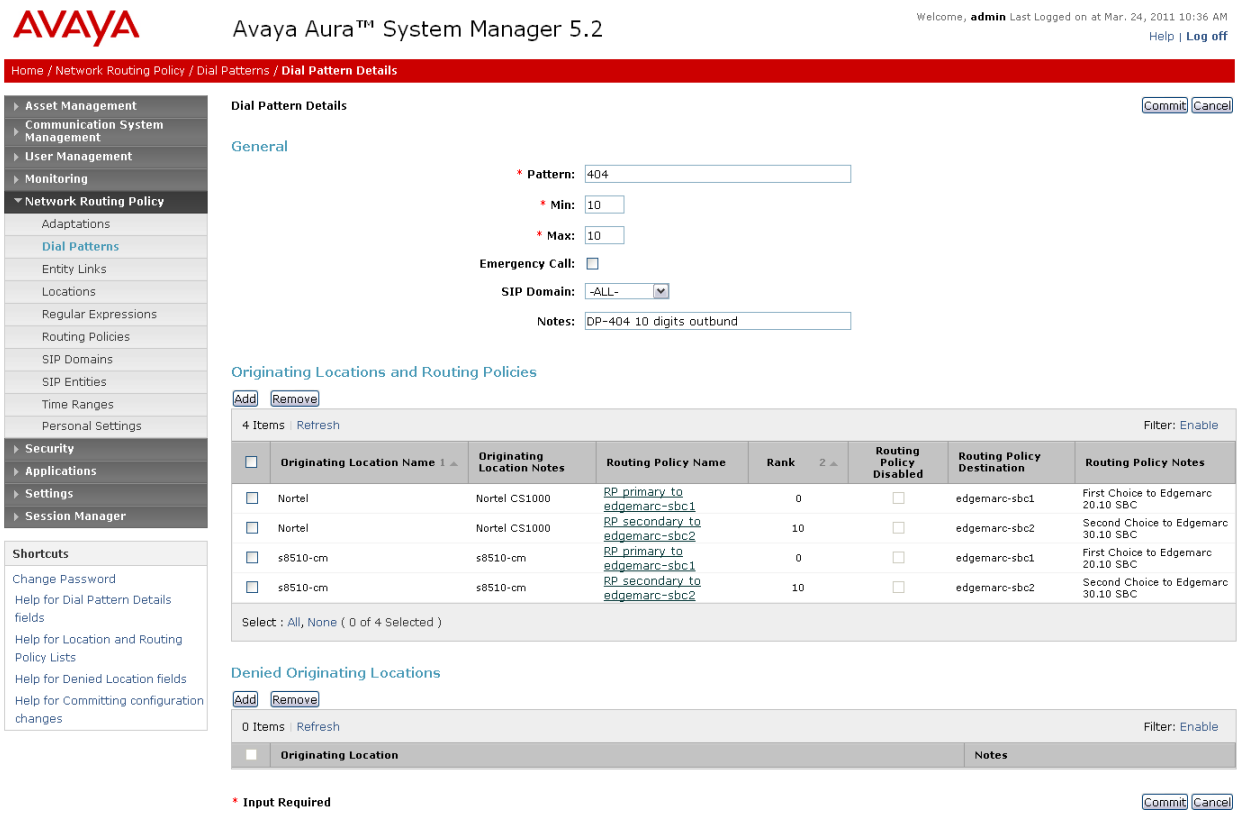
Settings
Session Manager
Shortcuts
Change Password
Help for Dial Pattern Details fields
Help for Location and Routing Policy Lists
Help for Denied Location fields
Help for Committing configuration changes
Dial Pattern Details
Commit Cancel
General
* Pattern: 101
* Min: 17
* Max: 24
Emergency Call:
SIP Domain: -ALL-
Notes: 1015 Preferred Calls to SBC
Originating Locations and Routing Policies
Add Remove
2 Items Refresh
Filter: Enable
Originating Location Name 1
Originating Location Notes
Routing Policy Name
Rank 2
Routing Policy Disabled
Routing Policy Destination
Routing Policy Notes
Nortel
Nortel CS1000
RP primary to edgemarc-sbc1
0
edgemarc-sbc1
First Choice to Edgemarc 20.10 SBC
Nortel
Nortel CS1000
RP secondary to edgemarc-sbc2
10
edgemarc-sbc2
Second Choice to Edgemarc 30.10 SBC
Select : All, None (0 of 2 Selected)
Denied Originating Locations
Add Remove
0 Items Refresh
Filter: Enable
Originating Location
Notes
* Input Required
Commit Cancel


AVAYA
Avaya Aura™ System Manager 5.2
Welcome, admin Last Logged on at Mar. 24, 2011 10:36 AM
Help | Log off
Home / Network Routing Policy / Dial Patterns / Dial Pattern Details
Asset Management
Communication System Management
User Management
Monitoring
Network Routing Policy
Adaptations
Dial Patterns
Entity Links
Locations
Regular Expressions
Routing Policies
SIP Domains
SIP Entities
Time Ranges
Personal Settings
Security
Applications
Settings
Session Manager
Shortcuts
Change Password
Help for Dial Pattern Details fields
Help for Location and Routing Policy Lists
Help for Denied Location fields
Help for Committing configuration changes
Dial Pattern Details
Commit Cancel
General
* Pattern: +16782383
* Min: 12
* Max: 12
Emergency Call:
SIP Domain: -ALL-
Notes: Inbound DP to Nortel
Originating Locations and Routing Policies
Add Remove
2 Items Refresh
Filter: Enable
Originating Location Name 1
Originating Location Notes
Routing Policy Name
Rank 2
Routing Policy Disabled
Routing Policy Destination
Routing Policy Notes
edgemarc-sbc1
Edgemarc 20.10 SBC
RP -Nortel1
0
Nortel1
RP - Nortel 1
edgemarc-sbc2
Edgemarc 30.10 SBC
RP-Nortel2
10
Nortel 2
RP - Nortel 2
Select : All, None (0 of 2 Selected)
Denied Originating Locations
Add Remove
0 Items Refresh
Filter: Enable
Originating Location
Notes
* Input Required
Commit Cancel


AVAYA
Avaya Aura™ System Manager 5.2
Welcome, admin Last Logged on at Mar. 24, 2011 10:36 AM
Help | Log off
Home / Network Routing Policy / Dial Patterns / Dial Pattern Details
Asset Management
Communication System Management
User Management
Monitoring
Network Routing Policy
Adaptations
Dial Patterns
Entity Links
Locations
Regular Expressions
Routing Policies
SIP Domains
SIP Entities
Time Ranges
Personal Settings
Security
Applications
Settings
Session Manager
Shortcuts
Change Password
Help for Dial Pattern Details fields
Help for Location and Routing Policy Lists
Help for Denied Location fields
Help for Committing configuration changes
Dial Pattern Details
Commit Cancel
General
* Pattern: 404
* Min: 10
* Max: 10
Emergency Call:
SIP Domain: -ALL-
Notes: DP-404 10 digits outbund
Originating Locations and Routing Policies
Add Remove
4 Items | Refresh
Filter: Enable
Originating Location Name 1
Originating Location Notes
Routing Policy Name
Rank 2
Routing Policy Disabled
Routing Policy Destination
Routing Policy Notes
Nortel Nortel CS1000 RP primary to edgemarc-sbc1 0 edgemarc-sbc1 First Choice to Edgemarc 20.10 SBC
Nortel Nortel CS1000 RP secondary to edgemarc-sbc2 10 edgemarc-sbc2 Second Choice to Edgemarc 30.10 SBC
s8510-cm s8510-cm RP primary to edgemarc-sbc1 0 edgemarc-sbc1 First Choice to Edgemarc 20.10 SBC
s8510-cm s8510-cm RP secondary to edgemarc-sbc2 10 edgemarc-sbc2 Second Choice to Edgemarc 30.10 SBC
Select : All, None (0 of 4 Selected)
Denied Originating Locations
Add Remove
0 Items | Refresh
Filter: Enable
Originating Location
Notes
* Input Required
Commit Cancel

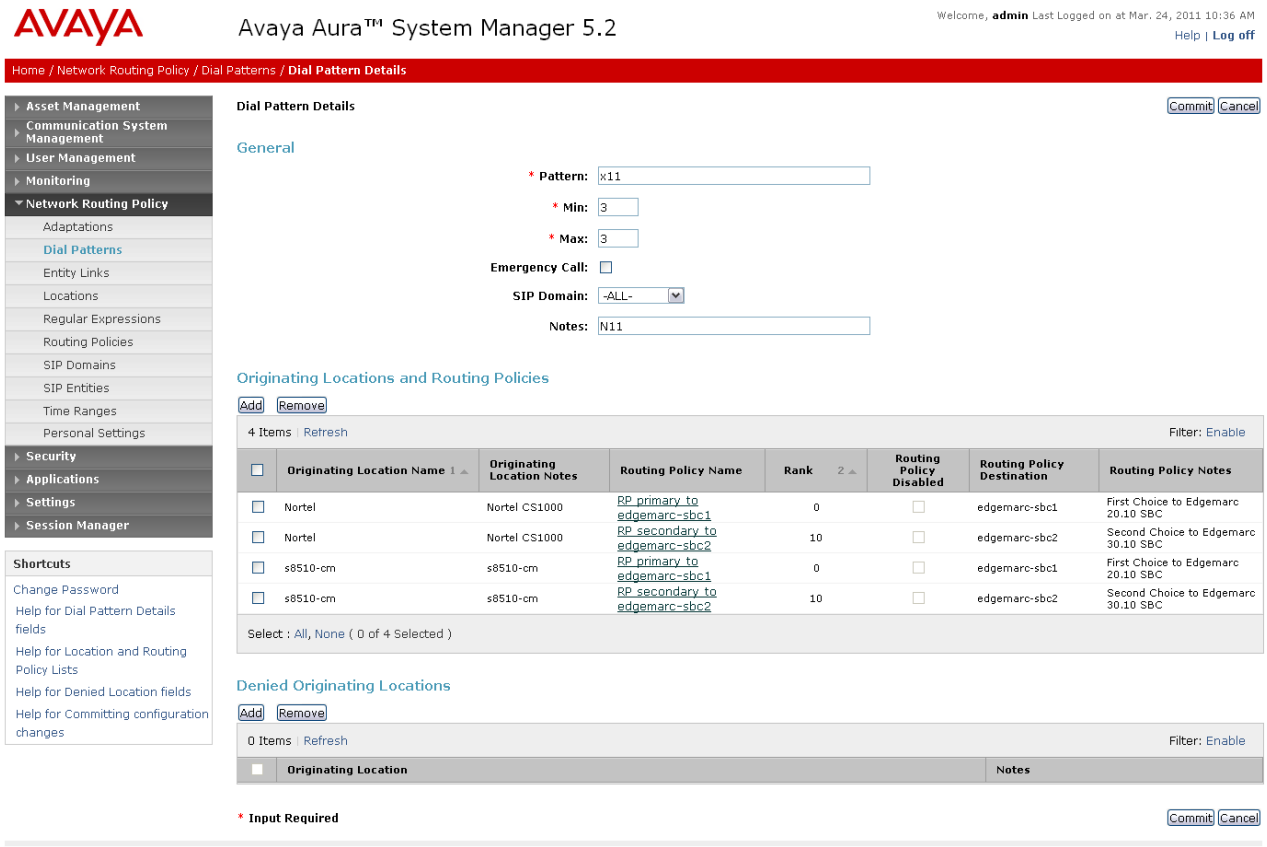


Figure 52 – Dial Patterns

9.2.8 Add Session Manager

In order to complete the configuration, we would need to add the Session Manager, by doing this we will provide the linkage between System Manager and Session Manager. Expand the **Session Manager** menu on the left and select **Session Manager Administration**. Then click **Add** (not shown), and fill in the fields as described below:

Under **General**:

- **SIP Entity Name**: Select the SIP Entity added for Avaya Session Manager
- **Description**: Descriptive comment
- **Management Access Point Host Name/IP**: Enter the IP address of the Session Manager management interface.

Under **Security Module**:

- **Network Mask:** Enter the network mask for the Session Manager
- **Default Gateway**: Enter the default gateway IP address for the Session Manager

Use default values for the rest of the fields. Click **Save** to add this Session Manager to your configuration.

Avaya Aura™ System Manager 5.2

Welcome, **admin** Last Logged on at Mar. 24, 2011 10:36 AM
Help **Log off**

Home / Session Manager / Session Manager Administration / **View Session Manager**

- Asset Management
- Communication System Management
- User Management
- Monitoring
- Network Routing Policy
- Security
- Applications
- Settings
- Session Manager
  - Session Manager Administration
  - Network Configuration
  - Device and Location Configuration
  - Application Configuration
  - System Status
  - System Tools

Shortcuts

Change Password
Help for Session Manager Administration
Help for Page Fields

View Session Manager

Return

General | Security Module | Monitoring | CDR | Personal Profile Manager (PPM) - Connection Settings | Event Server |
Expand All | Collapse All

General

SIP Entity Name	asset01
Description	Cox Lab ASM 1
Management Access Point Host Name/IP	192.168.20.43
Direct Routing to Endpoints	Enable

Security Module

SIP Entity IP Address	192.168.20.44
Network Mask	255.255.255.0
Default Gateway	192.168.20.1
Call Control PHB	46
QOS Priority	6
Speed & Duplex	Auto
VLAN ID	

Monitoring

Enable Monitoring	☐
Proactive cycle time (secs)	300
Reactive cycle time (secs)	20
Number of Retries	1

CDR

Enable CDR	☐
User	CDR_User
Password	

Personal Profile Manager (PPM) - Connection Settings

Limited PPM client connection	☑
Maximum Connection per PPM client	3
PPM Connection Timeout (mins)	5
PPM Packet Rate Limiting	☑
PPM Packet Rate Limiting Threshold	50

Event Server

Clear Subscription on Notification Failure	No

Return

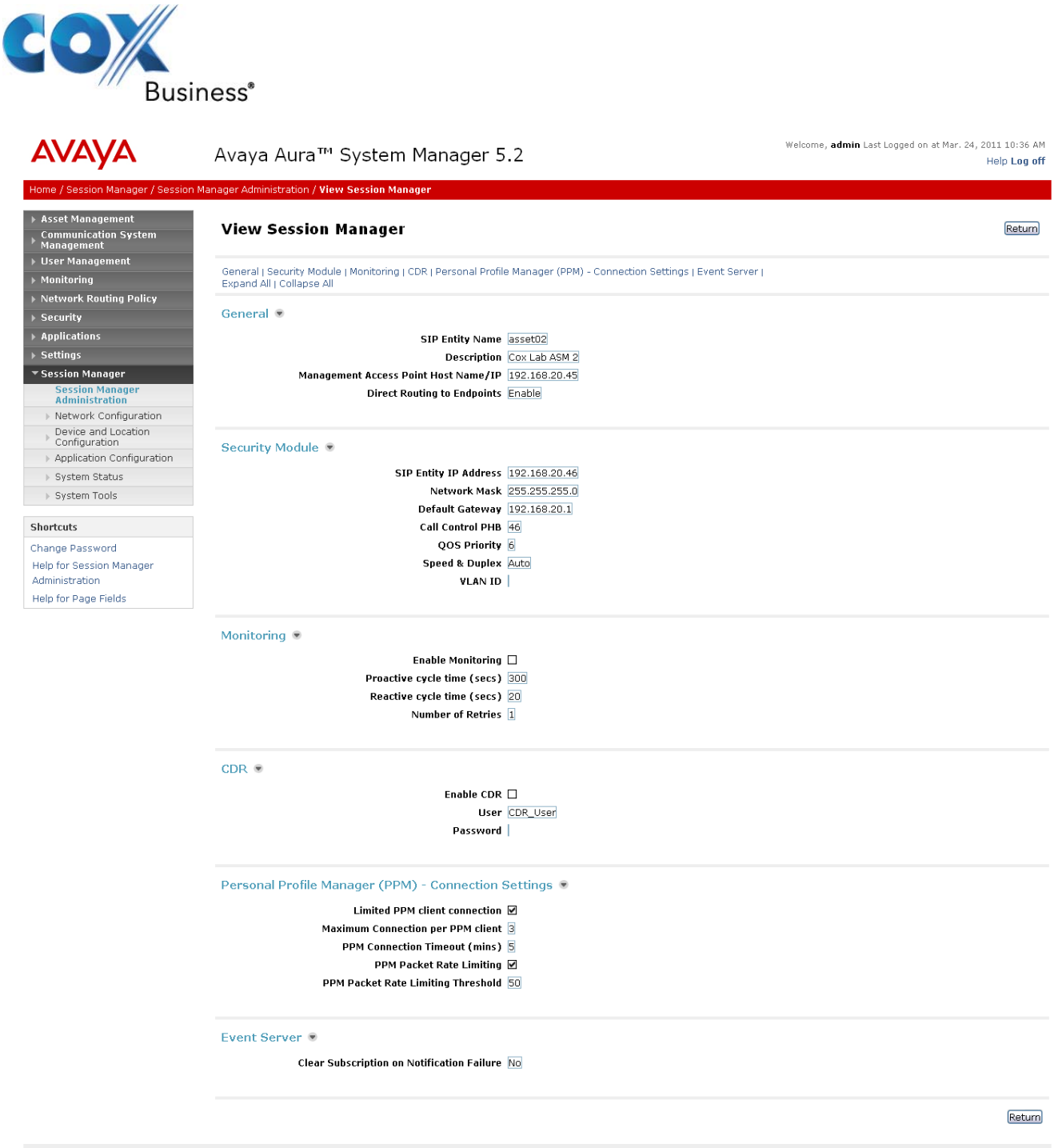


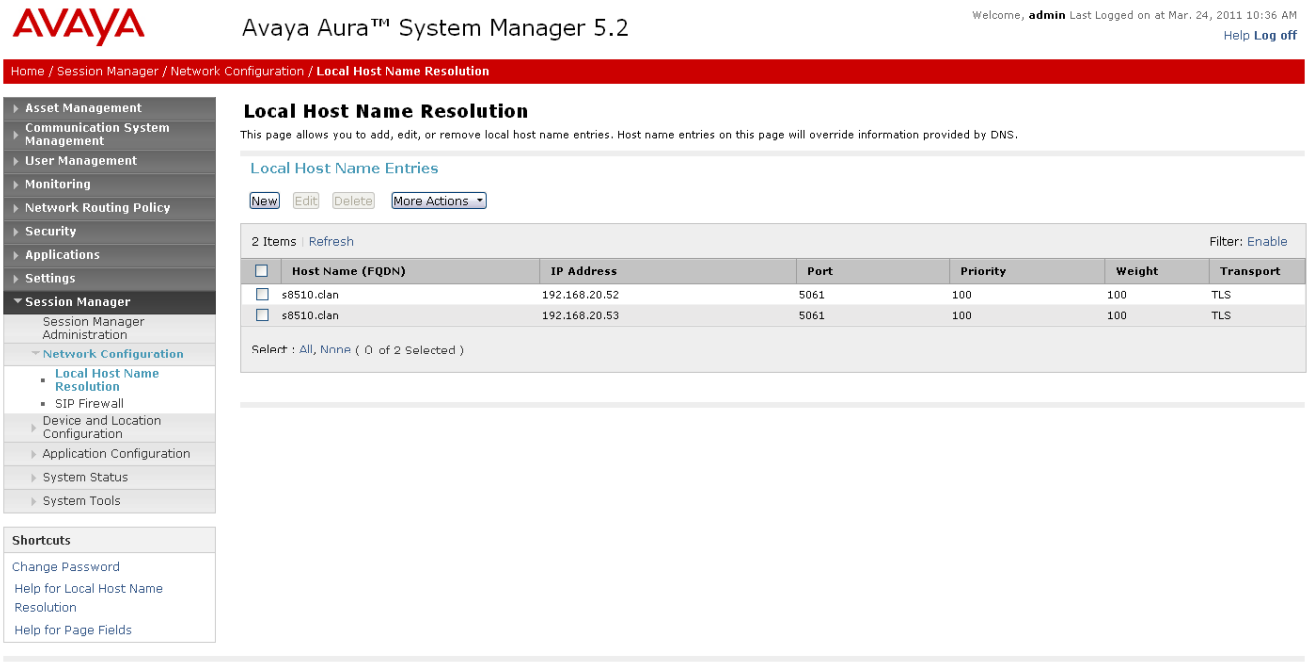
Figure 53 – Session Manager

9.2.9 Define Local Host Names

Any FQDN host names referenced in SIP Entity definitions must be defined.
Select **Session Manager → Network Configuration → Local Host Name Resolution** under the menu on your left. For each host name, click **New** and enter the following:

- **Host Name**: The FQDN used for the host
- **IP Address**: IP Address of the host's network interface
- **Port**: Port number to which SIP requests are sent
- **Transport**: Transport to be used for SIP requests

Defaults values can be apply for the remaining fields. The **Priority** and **Weight** fields are used when multiple IP Addresses are defined for the same host.



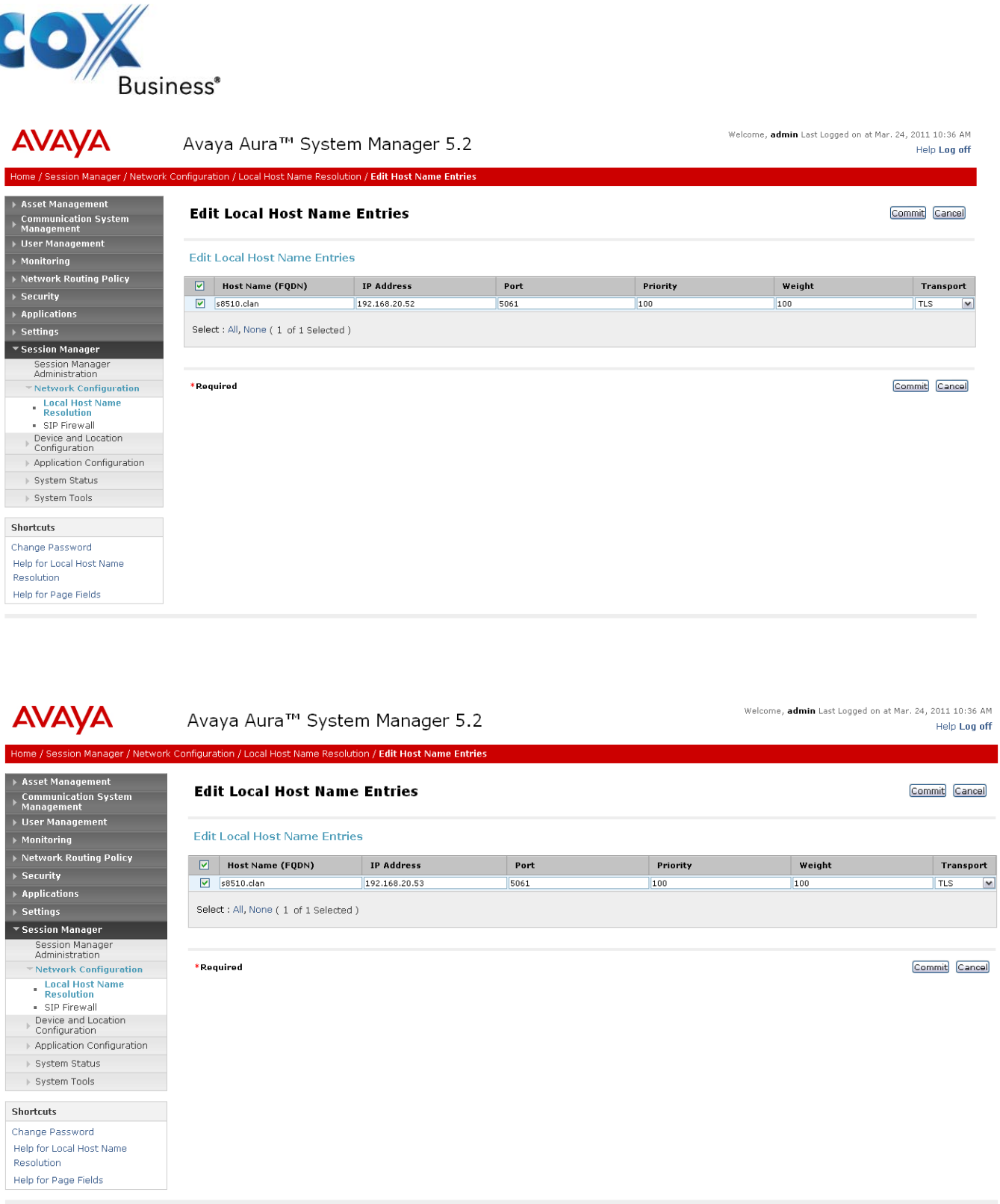
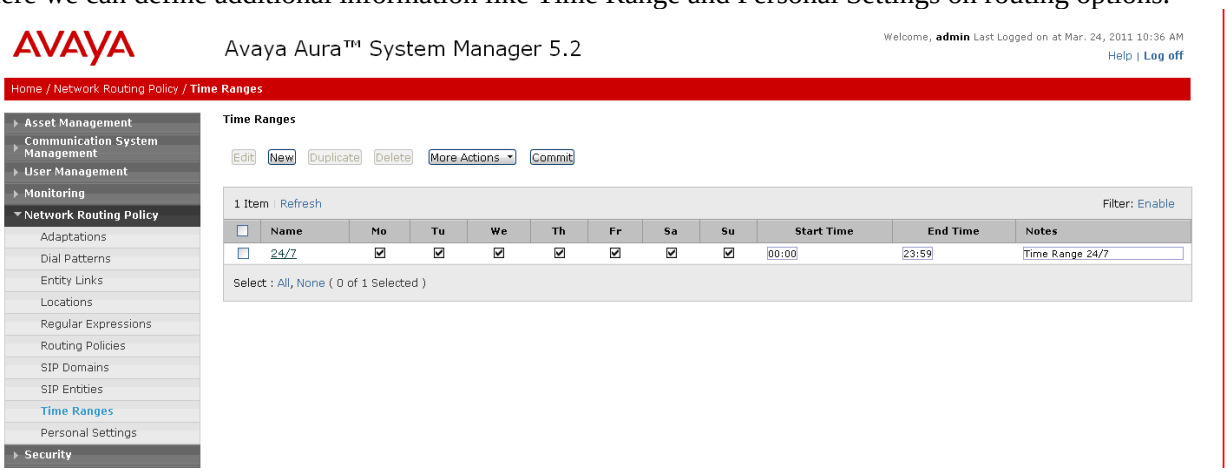


Figure 54 – Local Host Names

9.2.10 Define Time Range and Personal Settings

Here we can define additional information like Time Range and Personal Settings on routing options.



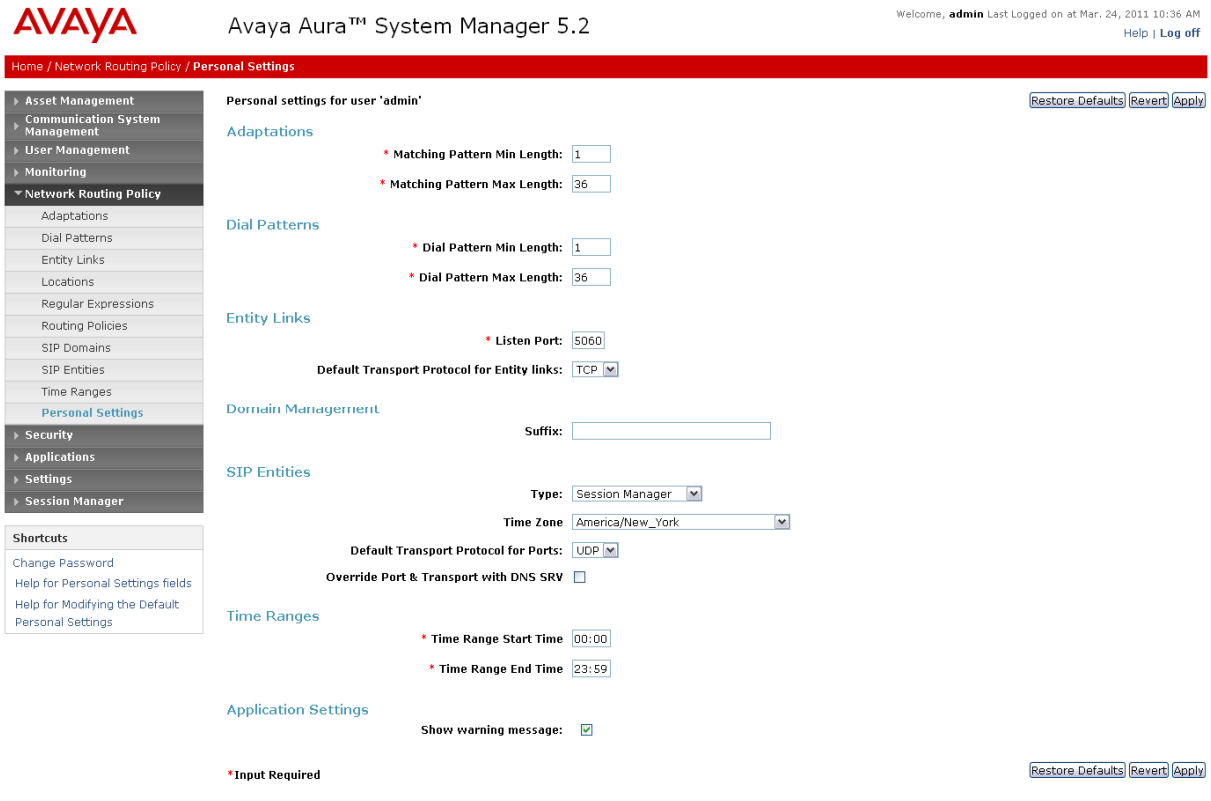


Figure 55 – Time Range and Personal Settings

10 Appendix

10.1 Appendix A: DHCP Server and Default Settings (Information Only)

Cox recommends static IP addressing for the IP phones. However, if you decide to use DHCP for dynamic IP address assignments for the phones, take note of the information below in section **10.1.1**:

10.1.1 The DHCP Server on Communication Manager Branch

An IP station needs an IP address to register. A Dynamic Host Configuration Protocol (DHCP) server provides each IP station with a unique IP address. If the DHCP server on Communication Manager Branch is used, it is administered using the Branch Device Manager interface. If the DHCP administration is incorrect or if there is a problem with the DHCP server, the IP stations will not receive an IP address and will not be able to register with the call server.

You can verify the performance of the Communication Manager Branch DHCP server by clicking **DHCP Server** under **Maintenance and Monitoring** > **Platform** > **Data Services**. The **DHCP Server Bindings and Statistics** screen displays.

The **DHCP Server Bindings and Statistics** screen provides a list of assigned IP addresses, as well as statistics about the overall performance of the DHCP server such as:

- The number of requests for IP addresses.
- The number of IP stations that were declined.
- The number of IP addresses that were released.

10.2 Appendix B: CS1K Patches

IN-SERVICE PEPS

PAT#	CR #	PATCH REF #	NAME	DATE	FILENAME	SPECINS
000	Q02038482	ISS1:1OF1	p28682_1	15/02/2011	p28682_1.cpm	NO
001	Q00350041-01	ISS1:1OF1	p16376_1	15/02/2011	p16376_1.cpm	NO
002	Q00349046-03	ISS1:1OF1	p17588_1	15/02/2011	p17588_1.cpm	NO
003	Q01725096-03	ISS1:1OF1	p23200_1	15/02/2011	p23200_1.cpm	NO
004	Q01680019	ISS1:1OF1	p24307_1	15/02/2011	p24307_1.cpm	NO
005	Q02097405	ISS1:1OF1	p24463_1	15/02/2011	p24463_1.cpm	NO
006	Q01782930-01	ISS1:1OF1	p24964_1	15/02/2011	p24964_1.cpm	NO
007	Q01873266-02	ISS1:1OF1	p25747_1	15/02/2011	p25747_1.cpm	NO
008	Q01884473-01	ISS1:1OF1	p26726_1	15/02/2011	p26726_1.cpm	NO
009	Q01974578-04	ISS1:1OF1	p27329_1	15/02/2011	p27329_1.cpm	NO
010	Q01974383-02	ISS1:1OF1	p27378_1	15/02/2011	p27378_1.cpm	NO
011	Q01983521-04	ISS1:1OF1	p27616_1	15/02/2011	p27616_1.cpm	NO
012	Q02092594	ISS1:1OF1	p27830_1	15/02/2011	p27830_1.cpm	NO
013	Q01999478-01	ISS1:1OF1	p27897_1	15/02/2011	p27897_1.cpm	NO
014	Q02064793-06	ISS1:1OF1	p27947_1	15/02/2011	p27947_1.cpm	NO
015	Q02007976-03	ISS1:1OF1	p28028_1	15/02/2011	p28028_1.cpm	NO
016	Q02007476	ISS1:1OF1	p28031_1	15/02/2011	p28031_1.cpm	NO
017	Q01849803	ISS1:1OF1	p28064_1	15/02/2011	p28064_1.cpm	YES
018	Q02011613-01	ISS1:1OF1	p28108_1	15/02/2011	p28108_1.cpm	NO
019	Q01982233-06	ISS1:1OF1	p28172_1	15/02/2011	p28172_1.cpm	NO
020	Q01976701-01	ISS1:1OF1	p28211_1	15/02/2011	p28211_1.cpm	NO
021	Q02019660-04	ISS2:1OF1	p28252_2	15/02/2011	p28252_2.cpm	NO
022	Q02017013-01	ISS1:1OF1	p28313_1	15/02/2011	p28313_1.cpm	NO
023	Q02097631	ISS1:1OF1	p28328_1	15/02/2011	p28328_1.cpm	NO

024	Q02024135-04	ISS1:1OF1	p28381_1	15/02/2011	p28381_1.cpm	YES
025	Q01987270-02	ISS1:1OF1	p28416_1	15/02/2011	p28416_1.cpm	NO
026	Q01938235-05	ISS2:1OF1	p28418_2	15/02/2011	p28418_2.cpm	NO
027	Q02029209	ISS1:1OF1	p28469_1	15/02/2011	p28469_1.cpm	NO
028	Q02022264	ISS1:1OF1	p28486_1	15/02/2011	p28486_1.cpm	NO
029	Q02030977	ISS1:1OF1	p28507_1	15/02/2011	p28507_1.cpm	NO
030	Q02032955-02	ISS1:1OF1	p28529_1	15/02/2011	p28529_1.cpm	NO
031	Q02020526	ISS1:1OF1	p28537_1	15/02/2011	p28537_1.cpm	NO
032	Q02031323-01	ISS1:1of1	p28546_1	15/02/2011	p28546_1.cpm	NO
033	Q02019323-01	ISS1:1OF1	p28551_1	15/02/2011	p28551_1.cpm	NO
034	Q02034083	ISS1:1OF1	p28553_1	15/02/2011	p28553_1.cpm	YES
035	Q02028560-04	ISS1:1OF1	p28564_1	15/02/2011	p28564_1.cpm	NO
036	Q02034835	ISS1:1OF1	p28569_1	15/02/2011	p28569_1.cpm	YES
037	Q02033951	ISS1:1OF1	p28579_1	15/02/2011	p28579_1.cpm	NO
038	Q02033139	ISS1:1OF1	p28582_1	15/02/2011	p28582_1.cpm	NO
039	Q02100914	ISS1:1OF1	p28597_1	15/02/2011	p28597_1.cpm	NO
040	Q02018384	ISS1:1OF1	p28598_1	15/02/2011	p28598_1.cpm	NO
041	Q02033201	ISS1:1OF1	p28631_1	15/02/2011	p28631_1.cpm	YES
042	Q02032155	p28538	p28638_1	15/02/2011	p28638_1.cpm	YES
043	Q02040038-03	ISS1:1OF1	p28647_1	15/02/2011	p28647_1.cpm	NO
044	Q02040015	ISS1:1OF1	p28657_1	15/02/2011	p28657_1.cpm	NO
045	Q02038675	ISS1:1OF1	p28665_1	15/02/2011	p28665_1.cpm	YES
046	Q02020734-02	ISS1:1OF1	p28668_1	15/02/2011	p28668_1.cpm	NO
047	Q02038440	ISS1:1OF1	p28674_1	15/02/2011	p28674_1.cpm	NO
048	Q02035396	ISS1:1OF1	p28675_1	15/02/2011	p28675_1.cpm	NO
049	Q02031118	ISS1:1OF1	p28680_1	15/02/2011	p28680_1.cpm	NO
050	Q02029228-01	ISS1:1OF1	p28681_1	15/02/2011	p28681_1.cpm	NO
051	Q02032785	ISS1:1OF1	p28935_1	15/02/2011	p28935_1.cpm	YES
052	Q02043231	ISS1:1OF1	p28712_1	15/02/2011	p28712_1.cpm	NO
053	Q02024455-01	ISS1:1OF1	p28717_1	15/02/2011	p28717_1.cpm	NO
054	Q02041981	p28695_1	p28719_1	15/02/2011	p28719_1.cpm	NO
055	Q02031359	p28679	p28725_1	15/02/2011	p28725_1.cpm	YES
056	Q02031959	ISS1:1OF1	p28728_1	15/02/2011	p28728_1.cpm	NO
057	Q02033000	ISS1:1of1	p28736_1	15/02/2011	p28736_1.cpm	NO
058	Q02039217-03	ISS1:1OF1	p28760_1	15/02/2011	p28760_1.cpm	NO
059	Q02043669	ISS1:1OF1	p28771_1	15/02/2011	p28771_1.cpm	NO
060	Q02021470-02	ISS1:1OF1	p28776_1	15/02/2011	p28776_1.cpm	NO
061	Q02079612-02	ISS1:1OF1	p29191_1	15/02/2011	p29191_1.cpm	NO
062	Q02035555	ISS1:1OF1	p28814_1	15/02/2011	p28814_1.cpm	NO
063	Q02049121-01	ISS1:1OF1	p28819_1	15/02/2011	p28819_1.cpm	NO
064	Q01986974-05	ISS1:1OF1	p28821_1	15/02/2011	p28821_1.cpm	YES
065	Q02031502	ISS1:1OF1	p28832_1	15/02/2011	p28832_1.cpm	YES
066	Q02039427-02	ISS1:1OF1	p28849_1	15/02/2011	p28849_1.cpm	NO
067	Q02095838	1SS1:1OF1	p28852_1	15/02/2011	p28852_1.cpm	NO
068	Q02036885-02	ISS1:1OF1	p28857_1	15/02/2011	p28857_1.cpm	NO
069	Q02043398	ISS1:1OF1	p28869_1	15/02/2011	p28869_1.cpm	NO
070	Q02055997	ISS1:1OF1	p28895_1	15/02/2011	p28895_1.cpm	NO
071	Q02061039-04	ISS1:1OF1	p28927_1	15/02/2011	p28927_1.cpm	NO
072	Q02044341	ISS1:1OF1	p28957_1	15/02/2011	p28957_1.cpm	NO
073	Q02058567-01	ISS1:1OF1	p28965_1	15/02/2011	p28965_1.cpm	NO
074	Q02048680	ISS1:1OF1	p28983_1	15/02/2011	p28983_1.cpm	NO
075	Q02062243-01	p29726	p28993_1	15/02/2011	p28993_1.cpm	NO
076	Q02062206-01	ISS1:1of1	p28994_1	15/02/2011	p28994_1.cpm	NO
077	Q02063326	ISS1:1OF1	p29027_1	15/02/2011	p29027_1.cpm	NO
078	Q02041385-02	ISS1:1OF1	p29032_1	15/02/2011	p29032_1.cpm	NO

```
079  Q02088715-02    ISS3:1OF1       p29077_3  15/02/2011  p29077_3.cpm   NO
080  Q02071739       ISS1:1OF1       p29096_1  15/02/2011  p29096_1.cpm   NO
081  Q02043226-02    ISS1:1OF1       p29125_1  15/02/2011  p29125_1.cpm   NO
082  Q02074796       ISS1:1OF1       p29126_1  15/02/2011  p29126_1.cpm   NO
083  Q02084339-02    ISS1:1OF1       p29137_1  15/02/2011  p29137_1.cpm   NO
084  Q02076740       ISS1:1OF1       p29154_1  15/02/2011  p29154_1.cpm   NO
085  Q02071451       ISS1:1OF1       p29164_1  15/02/2011  p29164_1.cpm   NO
086  Q02077171       ISS1:1OF1       p29169_1  15/02/2011  p29169_1.cpm   NO
087  Q02077764-04    ISS1:1OF1       p29174_1  15/02/2011  p29174_1.cpm   NO
088  Q02077977-01    ISS1:1OF1       p29177_1  15/02/2011  p29177_1.cpm   NO
089  Q02064503       ISS1:1OF1       p29196_1  15/02/2011  p29196_1.cpm   NO
090  Q02073690       ISS1:1OF1       p29208_1  15/02/2011  p29208_1.cpm   NO
091  Q02035822-01    ISS1:1OF1       p29212_1  15/02/2011  p29212_1.cpm   NO
092  Q02057782-01    ISS1:1OF1       p29215_1  15/02/2011  p29215_1.cpm   NO
093  Q02065521       ISS1:1OF1       p29218_1  15/02/2011  p29218_1.cpm   NO
094  Q02083027       ISS1:1OF1       p29233_1  15/02/2011  p29233_1.cpm   NO
095  Q02079849       ISS1:1OF1       p29238_1  15/02/2011  p29238_1.cpm   NO
096  Q02086333       ISS1:1OF1       p29262_1  15/02/2011  p29262_1.cpm   YES
097  Q02077909       ISS1:1of1       p29272_1  15/02/2011  p29272_1.cpm   NO
098  Q02077848-01    ISS1:1OF1       p29320_1  15/02/2011  p29320_1.cpm   NO
099  Q02092223       ISS1:1of1       p29343_1  15/02/2011  p29343_1.cpm   NO
100  Q02093188       ISS1:1OF1       p29352_1  15/02/2011  p29352_1.cpm   NO
101  Q02093256-03    ISS1:1OF1       p29354_1  15/02/2011  p29354_1.cpm   NO
102  Q02093325       ISS1:1OF1       p29355_1  15/02/2011  p29355_1.cpm   NO
103  Q02155346-01    ISS3:1OF1       p30074_1  15/02/2011  p30074_1.cpm   NO
104  Q02094012       ISS1:1OF1       p29370_1  15/02/2011  p29370_1.cpm   YES
105  Q02095619-04    ISS2:1OF1       p29376_2  15/02/2011  p29376_2.cpm   NO
106  Q02039403-01    ISS1:1OF1       p29378_1  15/02/2011  p29378_1.cpm   NO
107  Q02089914       ISS1:1OF1       p29406_1  15/02/2011  p29406_1.cpm   NO
108  Q02096318       ISS1:1of1       p29423_1  15/02/2011  p29423_1.cpm   NO

VAS008 ADMIN VSID 16 CUST -- TIME & DATE 15:57:16 29/03/2011
109  Q02097948       ISS1:1OF1       p29443_1  15/02/2011  p29443_1.cpm   NO
110  Q02100965       ISS1:1 OF 1     p29450_1  15/02/2011  p29450_1.cpm   NO
111  Q02102219-01    ISS1:1OF1       p29464_1  15/02/2011  p29464_1.cpm   NO
112  Q02149096       ISS1:1OF1       p30090_1  15/02/2011  p30090_1.cpm   NO
113  Q02103392-01    ISS1:1OF1       p29480_1  15/02/2011  p29480_1.cpm   NO

AUD370 VSID 16 CUST --
114  Q02103928       ISS1:1OF1       p29486_1  15/02/2011  p29486_1.cpm   NO
115  Q01925518-06    ISS2:1OF1       p29491_2  15/02/2011  p29491_2.cpm   NO
116  Q02104745-01    ISS1:1OF1       p29495_1  15/02/2011  p29495_1.cpm   NO
117  Q02107402       ISS1:1OF1       p29512_1  15/02/2011  p29512_1.cpm   NO
118  Q02109592       ISS1:1OF1       p29524_1  15/02/2011  p29524_1.cpm   NO
119  Q02108821-01    ISS1:1OF1       p29529_1  15/02/2011  p29529_1.cpm   NO
120  Q02109161       ISS1:1OF1       p29536_1  15/02/2011  p29536_1.cpm   NO
121  Q02066737-05    ISS1:1OF1       p29537_1  15/02/2011  p29537_1.cpm   NO
122  Q02110441-01    ISS1:1OF1       p29577_1  15/02/2011  p29577_1.cpm   NO
123  Q02108873-02    ISS1:1OF1       p29590_1  15/02/2011  p29590_1.cpm   NO
124  Q02119261       ISS2:1OF1       p29613_2  15/02/2011  p29613_2.cpm   NO
125  Q02075949-04    ISS1:1OF1       p29667_1  15/02/2011  p29667_1.cpm   NO
126  Q02110455-03    ISS1:1OF1       p29670_1  15/02/2011  p29670_1.cpm   NO
127  Q02112375-02    ISS1:1OF1       p29671_1  15/02/2011  p29671_1.cpm   NO
128  Q02157822-01    ISS1:1OF1       p30197_1  15/02/2011  p30197_1.cpm   NO
129  Q02096730       p29462 p28557   p29676_1  15/02/2011  p29676_1.cpm   NO
```

130	Q02071694-04	ISS1:1OF1	p29679_1	15/02/2011	p29679_1.cpm	NO
131	Q02024749-02	ISS1:1OF1	p29680_1	15/02/2011	p29680_1.cpm	NO
132	Q02007724-04	ISS1:1OF1	p29681_1	15/02/2011	p29681_1.cpm	YES
133	Q02110973	ISS1:1OF1	p29690_1	15/02/2011	p29690_1.cpm	NO
134	Q02109731-02	ISS1:1OF1	p29694_1	15/02/2011	p29694_1.cpm	YES
135	Q02109705-04	ISS1:1OF1	p29701_1	15/02/2011	p29701_1.cpm	NO
136	Q02096711	ISS1:1OF1	p29714_1	15/02/2011	p29714_1.cpm	NO
137	Q02114752	ISS1:1OF1	p29718_1	15/02/2011	p29718_1.cpm	NO
138	Q02124953	ISS1:1OF1	p29744_1	15/02/2011	p29744_1.cpm	NO
139	Q02100456-01	ISS1:1 OF 1	p29755_1	15/02/2011	p29755_1.cpm	NO
140	Q02108852	ISS1:1OF1	p29825_1	15/02/2011	p29825_1.cpm	NO
141	Q02129264	ISS1:1OF1	p29827_1	15/02/2011	p29827_1.cpm	NO
142	Q02111317	ISS1:1OF1	p29844_1	15/02/2011	p29844_1.cpm	NO
143	Q02131547	ISS1:1OF1	p29880_1	15/02/2011	p29880_1.cpm	NO
144	Q02135191	ISS1:1OF1	p29935_1	15/02/2011	p29935_1.cpm	NO
145	Q02137476	ISS1:1OF1	p29962_1	15/02/2011	p29962_1.cpm	NO
146	Q02011541-03	ISS1:1OF1	p29998_1	15/02/2011	p29998_1.cpm	NO
147	Q02140914-02	ISS1:1OF1	p30004_1	15/02/2011	p30004_1.cpm	NO
148	Q02144165	ISS1:1OF1	p30036_1	15/02/2011	p30036_1.cpm	NO
149	Q02145667	p29534	p30053_1	15/02/2011	p30053_1.cpm	NO
150	Q02131549	ISS1:1OF1	p30065_1	15/02/2011	p30065_1.cpm	NO
151	Q02147768	ISS1:1OF1	p30085_1	15/02/2011	p30085_1.cpm	NO
152	Q02150271	ISS1:1OF1	p30104_1	15/02/2011	p30104_1.cpm	NO
153	Q02058869-01	ISS1:1OF1	p30124_1	15/02/2011	p30124_1.cpm	NO
154	Q02151971	ISS1:1OF1	p30156_1	15/02/2011	p30156_1.cpm	NO
155	Q02155698	ISS1:1OF1	p30172_1	15/02/2011	p30172_1.cpm	NO
156	Q02156053	ISS1:1OF1	p30176_1	15/02/2011	p30176_1.cpm	NO
157	Q02124989	ISS1:1OF1	p30184_1	15/02/2011	p30184_1.cpm	NO
158	Q02157668	ISS1:1OF1	p30204_1	15/02/2011	p30204_1.cpm	NO
159	Q02158724	ISS1:1OF1	p30210_1	15/02/2011	p30210_1.cpm	NO
160	Q02157937	ISS1:1OF1	p30218_1	15/02/2011	p30218_1.cpm	YES
161	Q02159328-01	ISS1:1OF1	p30223_1	15/02/2011	p30223_1.cpm	NO
162	Q02164720	ISS1:1OF1	p30282_1	15/02/2011	p30282_1.cpm	NO
163	Q02052184-01	ISS1:1OF1	p30288_1	15/02/2011	p30288_1.cpm	NO
164	Q02113482	ISS1:1OF1	p30294_1	15/02/2011	p30294_1.cpm	NO
165	Q02167838	p29830	p30324_1	15/02/2011	p30324_1.cpm	NO
166	Q02170814	ISS1:1OF1	p30345_1	15/02/2011	p30345_1.cpm	NO
167	Q02168320	ISS1:1OF1	p30346_1	15/02/2011	p30346_1.cpm	NO
168	Q02172404	ISS1:1OF1	p30357_1	15/02/2011	p30357_1.cpm	NO
169	wi00730456	ISS1:1OF1	p30382_1	15/02/2011	p30382_1.cpm	NO
170	Q02160232	ISS1:1OF1	p30243_1	15/02/2011	p30243_1.cpm	NO
171	Q01994258-03	ISS1:1OF1	p30303_1	15/02/2011	p30303_1.cpm	NO
172	wi00716535	ISS1:1OF1	p30371_1	15/02/2011	p30371_1.cpm	NO

10.3 Appendix C: Sample SIP Traces for Avaya Session Manager and EdgeMarc 6400 E-SBC

For trouble shooting Avaya Aura Session Manager, please refer to section SIP Tracer Configuration and SIP Trace Viewer. For further explanation refer to Administering Avaya Aura Session Manager document.

```
/* Example of incoming call - SIP INVITE */

18:29:56.160018 192.168.20.10.5060 > 192.168.20.44.5060:
>>>>>>>>>>>>>>>>sip header start>>>>>>>>>>>>>>>>>>>
INVITE         sip:6782381099@192.168.20.44:5060        SIP/2.0Via:         SIP/2.0/UDP
192.168.20.10:5060;branch=z9hG4bKl3del5h5c4h1c6s81g42ld2uv6Record-Route:
<sip:6782381099@192.168.20.10;lr>From:                                  "COMPTONU2L2"
<sip:4046691324@192.168.20.10:5060;user=phone>;tag=SDbtdta01-1781430602-1274984996164-
To:    "ten    ninetynine"    <sip:6782381099@192.168.20.10:5060>Call-ID:    SDbtdta01-
004a61cc931c3ece585e06dc593229eb-vrvvfv3CSeq:          763596451          INVITEContact:
<sip:192.168.20.10:5060;transport=udp>Supported:  100relMax-forwards:  69Allow:  ACK,
BYE,  CANCEL,  INFO,  INVITE,  OPTIONS,  PRACK,  REFER,  NOTIFY,  UPDATEContent-Type:
application/sdpAccept:         multipart/mixed,         application/media_control+xml,
application/sdpContent-Length:   253
v=0o=BroadWorks 339289 1 IN IP4 192.168.20.10s=-c=IN IP4 192.168.20.10t=0 0m=audio
16404 RTP/AVP 0 96a=rtpmap:0 PCMU/8000/1a=rtpmap:96 telephone-event/8000/1a=fmtp:96 0-
15a=sqn: 0a=cdsc: 1 image udptl t38a=mptime:20 -a=ptime:20


/* Example of outgoing call – SIP INVITE */

18:29:58.382439 192.168.20.44.5060 > 192.168.20.10.5060:
>>>>>>>>>>>>>>>>sip header start>>>>>>>>>>>>>>>>>>>
INVITE    sip:192.168.20.10:5060;transport=udp    SIP/2.0From:    "ten    ninetynine"
<sip:6782381099@192.168.20.10>;tag=09268411d6bdf1681b4c0e2ec00To:         "COMPTONU2L2"
<sip:4046691324@192.168.20.10;user=phone>;tag=SDbtdta01-1781430602-1274984996164-Call-
ID:  SDbtdta01-004a61cc931c3ece585e06dc593229eb-vrvvfv3CSeq:  1  INVITEMax-Forwards:
67Route:               <sip:6782381099@192.168.20.10;lr>Via:                SIP/2.0/UDP
192.168.20.44;rport;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C2481357-
AP;ft=192.168.20.44~13c4Via:                                                SIP/2.0/UDP
192.168.20.43:5070;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C2481357Via:
SIP/2.0/TCP     192.168.20.43:5070;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C;sap=-
2050292912*1*016asm-callprocessing.sar722708416~1274984947038~1547698085~1Via:
SIP/2.0/TLS     192.168.20.44;branch=z9hG4bK09268411d6bdf1691b4c0e2ec00-AP;ft=1595Via:
SIP/2.0/TLS  192.168.20.53;branch=z9hG4bK09268411d6bdf1691b4c0e2ec00Supported:  timer,
replaces, join, histinfo, 100relAllow: INVITE, CANCEL, BYE, ACK, PRACK, SUBSCRIBE,
NOTIFY,    REFER,    OPTIONS,    INFO,    PUBLISHContact:    "Lab    User    1099"
<sip:6782381099@192.168.20.53:5061;user=phone;transport=tls>Session-Expires:
1200;refresher=uacMin-SE: 1200Accept-Language: enContent-Length: 0P-Asserted-Identity:
"Lab   User   1099"   <sip:6782381099@avaya.com:5061;user=phone>User-Agent:      Avaya
CM/R015x.02.1.016.4 AVAYA-SM-5.2.1.1.521012


/* Example of Call Forward – SIP INVITE */
14:17:26.622540 192.168.1.10.5060 > 192.168.1.1.5060:
>>>>>>>>>>>>>>>>sip header start>>>>>>>>>>>>>>>>>>>
INVITE          sip:4046691362@192.168.1.1          SIP/2.0Via:          SIP/2.0/UDP
192.168.1.10:5060;rport;branch=z9hG4bK7617892393a677b8fae387b40918c93dFrom:      "Pluto
6004"                              <sip:6782366004@192.168.1.1>;tag=c563f361f1b95f2aTo:
<sip:4046691362@192.168.1.1>Call-ID:
bb11b095453f93741cd57dff839ab375@192.168.1.10CSeq:  1420493315  INVITEContact:  "Pluto
6004"  <sip:6782366004@192.168.1.10:5060;transport=udp>Max-Forwards:  70Authorization:
Digest
username="6782366000",realm="BroadWorks",nonce="BroadWorksXg9bdq35iTkmppzfBW",response
="744e0f0773272f154ad36cf36fe57154",uri="sip:4046691362@192.168.1.1",algorithm=MD5,qop
=auth,nc=00000001,cnonce="9437101590e08913307b"Supported:           timerContent-Type:
application/sdpContent-Length: 204
v=0o=UserA  2683301831  1130673826  IN  IP4  192.168.1.10s=Session  SDPc=IN  IP4
192.168.1.10t=0  0m=audio  49152  RTP/AVP  0  101a=rtpmap:0  PCMU/8000a=rtpmap:101
telephone-event/8000a=fmtp:101 0-15
```

```
/* Example of Call Transfer – SIP INVITE */
Internet   Protocol,   Src:   192.168.20.44   (192.168.20.44),   Dst:   192.168.20.10
(192.168.20.10)
User Datagram Protocol, Src Port: sip (5060), Dst Port: sip (5060)
Session Initiation Protocol
    Request-Line: INVITE sip:192.168.20.10:5060;transport=udp SIP/2.0
        Method: INVITE
        Request-URI: sip:192.168.20.10:5060;transport=udp
            Request-URI Host Part: 192.168.20.10
            Request-URI Host Port: 5060
        [Resent Packet: False]
    Message Header
        From:                    "Lab                    User                    1099"
<sip:6782381099@avaya.com;user=phone>;tag=80faff71246bdf11e234c0e2ec00
            SIP Display info: "Lab User 1099"
            SIP from address: sip:6782381099@avaya.com
                SIP from address User Part: 6782381099
                SIP from address Host Part: avaya.com
            SIP tag: 80faff71246bdf11e234c0e2ec00
        To:      "4046691362"      <sip:4046691362@avaya.com;user=phone>;tag=SDash3999-
689327503-1274988098621
            SIP Display info: "4046691362"
            SIP to address: sip:4046691362@avaya.com
                SIP to address User Part: 4046691362
                SIP to address Host Part: avaya.com
            SIP tag: SDash3999-689327503-1274988098621
        Call-ID: 80faff71246bdf11f234c0e2ec00
        CSeq: 4 INVITE
            Sequence Number: 4
            Method: INVITE
        Max-Forwards: 67
        Route: <sip:EWGW_0@192.168.20.10;lr>
        Via:                                                                SIP/2.0/UDP
192.168.20.44;rport;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486697-
AP;ft=192.168.20.44~13c4
            Transport: UDP
            Sent-by Address: 192.168.20.44
            RPort: rport
            Branch: z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486697-AP
            ft=192.168.20.44~13c4
        Via:                                                                SIP/2.0/UDP
192.168.20.43:5070;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486697
            Transport: UDP
            Sent-by Address: 192.168.20.43
            Sent-by port: 5070
            Branch: z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486697
        Via:                                                                SIP/2.0/TCP
192.168.20.43:5070;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C;sap=-
2050292912*1*016asm-callprocessing.sar722708416~1274988048658~1547702683~1
            Transport: TCP
            Sent-by Address: 192.168.20.43
            Sent-by port: 5070
            Branch: z9hG4bKC0A8142BBADF00D0000012882E4CD1C
            sap=-2050292912*1*016asm-
callprocessing.sar722708416~1274988048658~1547702683~1
        Via:    SIP/2.0/TLS    192.168.20.44;branch=z9hG4bK0164e80246bdf135234c0e2ec00-
AP;ft=1596
            Transport: TLS
            Sent-by Address: 192.168.20.44
            Branch: z9hG4bK0164e80246bdf135234c0e2ec00-AP
            ft=1596
        Via: SIP/2.0/TLS 192.168.20.52;branch=z9hG4bK0164e80246bdf135234c0e2ec00
            Transport: TLS
            Sent-by Address: 192.168.20.52
            Branch: z9hG4bK0164e80246bdf135234c0e2ec00
        Supported: timer, replaces, join, histinfo, 100rel
        Allow: INVITE, CANCEL, BYE, ACK, PRACK, SUBSCRIBE, NOTIFY, REFER, OPTIONS,
INFO, PUBLISH
        Contact:                                                          "COMPTONU2L2"
<sip:814046691324@192.168.20.52;transport=tls;user=phone>
```

```
            Contact                         Binding:                              "COMPTONU2L2"
<sip:814046691324@192.168.20.52;transport=tls;user=phone>
                URI:                                                              "COMPTONU2L2"
<sip:814046691324@192.168.20.52;transport=tls;user=phone>
                    SIP Display info: "COMPTONU2L2"
                    SIP contact address: sip:814046691324@192.168.20.52
        Session-Expires: 1200;refresher=uac
        Min-SE: 1200
        Content-Length: 0
        P-Asserted-Identity: "COMPTONU2L2" <sip:814046691324@avaya.com>
            SIP Display info: "COMPTONU2L2"
            SIP PAI Address: sip:814046691324@avaya.com
        User-Agent:  Avaya CM/R015x.02.1.016.4 AVAYA-SM-5.2.1.1.521012

/* Example of Call Forward - SIP INVITE */
Internet   Protocol,   Src:   192.168.20.44   (192.168.20.44),   Dst:   192.168.20.10
(192.168.20.10)
User Datagram Protocol, Src Port: sip (5060), Dst Port: sip (5060)
Session Initiation Protocol
    Status-Line: SIP/2.0 181 Call Is Being Forwarded
        Status-Code: 181
        [Resent Packet: False]
        [Request Frame: 202]
        [Response Time (ms): 45]
    Message Header
        From:  "COMPTONU2L2"  <sip:4046691324@192.168.20.10;user=phone>;tag=SDokche01-
1981337805-1274988157030-
            SIP Display info: "COMPTONU2L2"
            SIP from address: sip:4046691324@192.168.20.10
                SIP from address User Part: 4046691324
                SIP from address Host Part: 192.168.20.10
            SIP tag: SDokche01-1981337805-1274988157030-
        To:                                  "ten                                  ninetynine"
<sip:6782381099@192.168.20.10>;tag=040c395246bdf150234c0e2ec00
            SIP Display info: "ten ninetynine"
            SIP to address: sip:6782381099@192.168.20.10
                SIP to address User Part: 6782381099
                SIP to address Host Part: 192.168.20.10
            SIP tag: 040c395246bdf150234c0e2ec00
        Call-ID: SDokche01-7dcaab2bb4ac28be57f085e84e647323-vrvvfv3
        CSeq: 765176884 INVITE
            Sequence Number: 765176884
            Method: INVITE
        Via: SIP/2.0/UDP 192.168.20.10:5060;branch=z9hG4bKubd457h63eg1c3o8sf76k52u47
            Transport: UDP
            Sent-by Address: 192.168.20.10
            Sent-by port: 5060
            Branch: z9hG4bKubd457h63eg1c3o8sf76k52u47
        Record-Route: <sip:192.168.20.53:5061;lr;transport=tls>
        Record-Route: <sip:bb0c99f@192.168.20.44;transport=tls;lr>
        Record-Route:            <sip:192.168.20.43:15060;lr;sap=-2050292912*1*016asm-
callprocessing.sar722708416~1274988107798~1547702783~1;transport=udp>
        Record-Route: <sip:bb0c99f@192.168.20.44;transport=udp;lr>
        Record-Route: <sip:6782381099@192.168.20.10;lr>
        Contact: "Lab User 1099" <sip:6782381099@192.168.20.53:5061;transport=tls>
            Contact          Binding:          "Lab          User          1099"
<sip:6782381099@192.168.20.53:5061;transport=tls>
                URI: "Lab User 1099" <sip:6782381099@192.168.20.53:5061;transport=tls>
                    SIP Display info: "Lab User 1099"
                    SIP contact address: sip:6782381099@192.168.20.53:5061
        Supported: timer, replaces, join, histinfo, 100rel
        Allow: INVITE, CANCEL, BYE, ACK, PRACK, SUBSCRIBE, NOTIFY, REFER, OPTIONS,
INFO, PUBLISH
        RSeq: 1
        Require: 100rel
        Content-Type: application/sdp
        Content-Length: 163
        P-Asserted-Identity: <sip:4046691362@avaya.com:5061;user=phone>
            SIP PAI Address: sip:4046691362@avaya.com:5061
        Server:  Avaya CM/R015x.02.1.016.4 AVAYA-SM-5.2.1.1.521012
```

```
    Message Body
        Session Description Protocol
            Session Description Protocol Version (v): 0
            Owner/Creator, Session Id (o): - 1 2 IN IP4 192.168.20.53
                Owner Username: -
                Session ID: 1
                Session Version: 2
                Owner Network Type: IN
                Owner Address Type: IP4
                Owner Address: 192.168.20.53
            Session Name (s): -
            Connection Information (c): IN IP4 192.168.20.51
                Connection Network Type: IN
                Connection Address Type: IP4
                Connection Address: 192.168.20.51
            Bandwidth Information (b): AS:64
            Time Description, active time (t): 0 0
                Session Start Time: 0
                Session Stop Time: 0
            Media Description, name and address (m): audio 2616 RTP/AVP 0 96
                Media Type: audio
                Media Port: 2616
                Media Protocol: RTP/AVP
                Media Format: ITU-T G.711 PCMU
                Media Format: DynamicRTP-Type-96
            Media Attribute (a): rtpmap:0 PCMU/8000
                Media Attribute Fieldname: rtpmap
                Media Format: 0
                MIME Type: PCMU
                Sample Rate: 8000
            Media Attribute (a): rtpmap:96 telephone-event/8000
                Media Attribute Fieldname: rtpmap
                Media Format: 96
                MIME Type: telephone-event
                Sample Rate: 8000

No.     Time        Source                Destination           Protocol Info
    229 140.166593   192.168.20.44           192.168.20.10           SIP       Request:
UPDATE sip:192.168.20.10:5060;transport=udp

Frame 229 (1349 bytes on wire, 1349 bytes captured)
Linux cooked capture
Internet   Protocol,   Src:   192.168.20.44   (192.168.20.44),   Dst:   192.168.20.10
(192.168.20.10)
User Datagram Protocol, Src Port: sip (5060), Dst Port: sip (5060)
Session Initiation Protocol
    Request-Line: UPDATE sip:192.168.20.10:5060;transport=udp SIP/2.0
        Method: UPDATE
        Request-URI: sip:192.168.20.10:5060;transport=udp
            Request-URI Host Part: 192.168.20.10
            Request-URI Host Port: 5060
        [Resent Packet: False]
    Message Header
        From:                                                              "COMPTONU2L2"
<sip:4046691324@192.168.20.10;user=phone>;tag=040c395246bdf151234c0e2ec00
            SIP Display info: "COMPTONU2L2"
            SIP from address: sip:4046691324@192.168.20.10
                SIP from address User Part: 4046691324
                SIP from address Host Part: 192.168.20.10
            SIP tag: 040c395246bdf151234c0e2ec00
        To:      "4046691362"      <sip:4046691362@avaya.com;user=phone>;tag=SDg994999-
938466331-1274988157498
            SIP Display info: "4046691362"
            SIP to address: sip:4046691362@avaya.com
                SIP to address User Part: 4046691362
                SIP to address Host Part: avaya.com
            SIP tag: SDg994999-938466331-1274988157498
        Call-ID: 040c395246bdf152234c0e2ec00
        CSeq: 3 UPDATE
            Sequence Number: 3
```

```
            Method: UPDATE
        Max-Forwards: 67
        Route: <sip:EWGW_0@192.168.20.10;lr>
        Via:                                                                SIP/2.0/UDP
192.168.20.44;rport;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486785-
AP;ft=192.168.20.44~13c4
            Transport: UDP
            Sent-by Address: 192.168.20.44
            RPort: rport
            Branch: z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486785-AP
            ft=192.168.20.44~13c4
        Via:                                                                SIP/2.0/UDP
192.168.20.43:5070;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486785
            Transport: UDP
            Sent-by Address: 192.168.20.43
            Sent-by port: 5070
            Branch: z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486785
        Via:                                                                SIP/2.0/TCP
192.168.20.43:5070;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C;sap=-
2050292912*1*016asm-callprocessing.sar722708416~1274988107842~1547702787~1
            Transport: TCP
            Sent-by Address: 192.168.20.43
            Sent-by port: 5070
            Branch: z9hG4bKC0A8142BBADF00D0000012882E4CD1C
            sap=-2050292912*1*016asm-
callprocessing.sar722708416~1274988107842~1547702787~1
        Via:    SIP/2.0/TLS    192.168.20.44;branch=z9hG4bK040c395246bdf155234c0e2ec00-
AP;ft=1596
            Transport: TLS
            Sent-by Address: 192.168.20.44
            Branch: z9hG4bK040c395246bdf155234c0e2ec00-AP
            ft=1596
        Via: SIP/2.0/TLS 192.168.20.52;branch=z9hG4bK040c395246bdf155234c0e2ec00
            Transport: TLS
            Sent-by Address: 192.168.20.52
            Branch: z9hG4bK040c395246bdf155234c0e2ec00
        Supported: timer, replaces, join, histinfo, 100rel
        Allow: INVITE, CANCEL, BYE, ACK, PRACK, SUBSCRIBE, NOTIFY, REFER, OPTIONS,
INFO, PUBLISH
        Contact:                                                        "COMPTONU2L2"
<sip:814046691324@192.168.20.52;transport=tls;user=phone>
            Contact                         Binding:                    "COMPTONU2L2"
<sip:814046691324@192.168.20.52;transport=tls;user=phone>
                URI:                                                    "COMPTONU2L2"
<sip:814046691324@192.168.20.52;transport=tls;user=phone>
                    SIP Display info: "COMPTONU2L2"
                    SIP contact address: sip:814046691324@192.168.20.52
        Session-Expires: 1200;refresher=uac
        Min-SE: 1200
        Content-Length: 0
        P-Asserted-Identity: "COMPTONU2L2" <sip:814046691324@avaya.com>
            SIP Display info: "COMPTONU2L2"
            SIP PAI Address: sip:814046691324@avaya.com
        User-Agent:  Avaya CM/R015x.02.1.016.4 AVAYA-SM-5.2.1.1.521012


/* Example of Anonymous Caller ID - SIP INVITE */

Internet   Protocol,   Src:   192.168.20.44   (192.168.20.44),   Dst:   192.168.20.10
(192.168.20.10)
User Datagram Protocol, Src Port: sip (5060), Dst Port: sip (5060)
Session Initiation Protocol
    Request-Line: INVITE sip:192.168.20.10:5060;transport=udp SIP/2.0
        Method: INVITE
        Request-URI: sip:192.168.20.10:5060;transport=udp
            Request-URI Host Part: 192.168.20.10
            Request-URI Host Port: 5060
        [Resent Packet: False]
    Message Header
```

```
        From:                                                                   "Anonymous"
<sip:anonymous@anonymous.invalid;user=phone>;tag=802afa1246bdf174234c0e2ec00
            SIP Display info: "Anonymous"
            SIP from address: sip:anonymous@anonymous.invalid
                SIP from address User Part: anonymous
                SIP from address Host Part: anonymous.invalid
            SIP tag: 802afa1246bdf174234c0e2ec00
        To:      "4046691362"      <sip:4046691362@avaya.com;user=phone>;tag=SDs2le999-
514304466-1274988178818
            SIP Display info: "4046691362"
            SIP to address: sip:4046691362@avaya.com
                SIP to address User Part: 4046691362
                SIP to address Host Part: avaya.com
            SIP tag: SDs2le999-514304466-1274988178818
        Call-ID: 802afa1246bdf175234c0e2ec00
        CSeq: 3 INVITE
            Sequence Number: 3
            Method: INVITE
        Max-Forwards: 67
        Route: <sip:EWGW_0@192.168.20.10;lr>
        Via:                                                                    SIP/2.0/UDP
192.168.20.44;rport;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486850-
AP;ft=192.168.20.44~13c4
            Transport: UDP
            Sent-by Address: 192.168.20.44
            RPort: rport
            Branch: z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486850-AP
            ft=192.168.20.44~13c4
        Via:                                                                    SIP/2.0/UDP
192.168.20.43:5070;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486850
            Transport: UDP
            Sent-by Address: 192.168.20.43
            Sent-by port: 5070
            Branch: z9hG4bKC0A8142BBADF00D0000012882E4CD1C2486850
        Via:                                                                    SIP/2.0/TCP
192.168.20.43:5070;branch=z9hG4bKC0A8142BBADF00D0000012882E4CD1C;sap=-
2050292912*1*016asm-callprocessing.sar722708416~1274988129109~1547702819~1
            Transport: TCP
            Sent-by Address: 192.168.20.43
            Sent-by port: 5070
            Branch: z9hG4bKC0A8142BBADF00D0000012882E4CD1C
            sap=-2050292912*1*016asm-
callprocessing.sar722708416~1274988129109~1547702819~1
        Via:    SIP/2.0/TLS    192.168.20.44;branch=z9hG4bK0b673a6246bdf17d234c0e2ec00-
AP;ft=1596
            Transport: TLS
            Sent-by Address: 192.168.20.44
            Branch: z9hG4bK0b673a6246bdf17d234c0e2ec00-AP
            ft=1596
        Via: SIP/2.0/TLS 192.168.20.52;branch=z9hG4bK0b673a6246bdf17d234c0e2ec00
            Transport: TLS
            Sent-by Address: 192.168.20.52
            Branch: z9hG4bK0b673a6246bdf17d234c0e2ec00
        Supported: timer, replaces, join, histinfo, 100rel
        Allow: INVITE, CANCEL, BYE, ACK, PRACK, SUBSCRIBE, NOTIFY, REFER, OPTIONS,
INFO, PUBLISH
        Contact: "Lab User 1099" <sip:192.168.20.52;transport=tls>
            Contact Binding: "Lab User 1099" <sip:192.168.20.52;transport=tls>
                URI: "Lab User 1099" <sip:192.168.20.52;transport=tls>
                    SIP Display info: "Lab User 1099"
                    SIP contact address: sip:192.168.20.52
        Session-Expires: 1200;refresher=uac
        Min-SE: 1200
        Accept-Language: en
        Privacy: id
        Content-Length: 0
        P-Asserted-Identity:              "Lab              User              1099"
<sip:6782381099@avaya.com:5061;user=phone>
            SIP Display info: "Lab User 1099"
            SIP PAI Address: sip:6782381099@avaya.com:5061
```

```
User-Agent:  Avaya CM/R015x.02.1.016.4 AVAYA-SM-5.2.1.1.521012
```